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LAPORAN TAHUNAN **2018**
ANNUAL REPORT

AKADEMI SAINS MALAYSIA

LAPORAN TAHUNAN
2018

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Konsep Rekaan Kulit

Sebagai Badan Pemikir Sains, Teknologi dan Inovasi, Akademi Sains Malaysia memberi keutamaan kepada maklumat yang sahih dan benar dalam membentang syornya. Konsep rekaan kulit menggambarkan Akademi sebagai organisasi yang mempunyai pendekatan yang unik pada masa yang sama, berganding bahu dengan pelbagai entiti bagi memastikan Malaysia yang harmoni, makmur dan lestari. Matlamat kami untuk mencapai Malaysia yang progresif bermula dengan cetusan idea yang terbaik bagi masyarakat sejagat.

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AKADEMI SAINS MALAYSIA

THINK SCIENCE,
CELEBRATE TECHNOLOGY,
INSPIRE INNOVATION

Menjadi Peneraju Pemikir yang diiktiraf bagi isu berkaitan sains, kejuruteraan, teknologi dan inovasi.

Memupuk kecemerlangan dalam bidang Sains, Kejuruteraan dan Teknologi (SET) untuk kebaikan masyarakat keseluruhannya.

Misi

- Menjadi Peneraju Pemikir
- Menjadi Badan Penasihat Apex dalam hal berkaitan Sains, Teknologi dan Inovasi (STI)
- Menjadi penggalak yang efektif terhadap kesedaran dan pemahaman awam tentang STI
- Menjadikan STI sebagai asas bagi pembangunan ekonomi dan kesejahteraan rakyat

Fungsi

- Menasihati Kerajaan berkenaan hal STI yang berkepentingan kepada negara dan antarabangsa
- Memupuk budaya kecemerlangan SET di Malaysia
- Membantu meningkatkan keupayaan teknologi sektor industri di Malaysia
- Menggalakkan kesedaran dan pemahaman umum mengenai kepentingan STI dalam kehidupan seharian
- Menjalin jaringan dan kerjasama antarabangsa
- Penerbitan saintifik

Strategi

- Memanfaatkan pemikiran saintifik untuk menentukan hala tuju STI negara
- Memupuk budaya kecemerlangan SET
- Memastikan input STI yang berwibawa dan tepat pada masanya
- Menggalakkan penggunaan dan aplikasi sains untuk kesejahteraan rakyat
- Memudahcara pelaksanaan strategi ekonomi berasaskan inovasi

Aktiviti Kami

Kajian Strategik STI
- Malaysia 2050
- Sosio Ekonomi
- Penjelmaan Teknologi Baru
- Kelestarian Sains

Program Strategik STI
- Pembangunan Kapasiti
- Pengantara
- Konsortium Sains
- Fora Perundingan

Pemegang Taruh

Dalaman
- Felo
- *Associates*
- *Young Scientists Network-ASM* (YSN-ASM)
- *Top Research Scientists Malaysia* (TRSM)
- Pengurusan ASM

Luaran
- Jabatan Perdana Menteri dan Agensi Pusat
- Kementerian Tenaga, Sains, Teknologi, Alam Sekitar dan Perubahan Iklim (MESTECC) dan agensinya
- Kementerian lain dan agensi berkaitan
- Industri
- Institusi Penyelidikan
- Institusi Pendidikan Tinggi (IPT)
- Badan Profesional Sains dan Teknologi (S&T)
- Organisasi antarabangsa STI
- Komuniti bandar dan luar bandar

Piagam Pelanggan

- Memberi khidmat nasihat yang bebas, boleh dipercayai berasaskan data yang tepat pada masanya
- Komited dalam mewujudkan program yang berkualiti ke arah pembangunan asas STI negara yang kukuh
- Mewakili Malaysia dan komuniti saintifiknya di arena antarabangsa
- Menyebarkan pengetahuan saintifik

TITIPAN DARI PRESIDEN

PROFESOR DATUK DR

Asra Israil

FASc

“KAMI AKAN TERUS MELAKSANAKAN PROGRAM BERINOVATIF DAN KAJIAN BERIMPAK TINGGI UNTUK MEMAJUKAN MALAYSIA.”

BAGAIMANAKAH ANDA MENGGAMBARKAN TAHUN 2018?

Bagi ASM, tahun 2018 secara keseluruhan adalah hebat dan sibuk. Kami telah berusaha untuk memperbaiki amalan dan komunikasi dalam kalangan pemegang taruh Akademi, termasuk pakar sains, industri, media dan orang awam dalam menyampaikan objektif kami. Walaupun sibuk, saya berterima kasih kerana diberi peluang untuk memimpin sebuah organisasi dengan jaringan pakar yang bersedia menerima transformasi setiap hari.

Di seluruh dunia, kerajaan menjalankan pelbagai mekanisme untuk mencapai input dan nasihat saintifik. Malaysia juga tidak terkecuali. Dalam memenuhi peranan kami sebagai Peneraju Pemikir STI Malaysia, kami terus menerbitkan kajian yang relevan dan tepat pada masanya. Dipimpin oleh Felo ASM, kajian kami bermatlamat untuk memberi cadangan dasar atas kepentingan nasional.

Selain daripada kajian, kami juga terus memberi tumpuan kepada program berasaskan SET. ASM sentiasa berusaha untuk memupuk rakyat Malaysia ke arah membina bakat saintifik untuk masa hadapan. Menerusi pelaksanaan aktiviti dan program strategik yang dirangka, kami dapat melihat hasil usaha yang kami harapkan dalam meningkatkan kesedaran STEM di negara ini.

Biro antarabangsa ASM terus memupuk hubungan yang kukuh dengan komuniti saintifik antarabangsa, yang membolehkan kami mendapat manfaat daripada kepakaran global. Dari menghadiri mesyuarat ke penganjuran persidangan, kami terus memposisikan Malaysia sebagai peneraju bertaraf dunia dalam arena sains melalui penyertaan aktif sebagai rakan kongsi pengetahuan. Penglibatan ini telah membolehkan kami menempatkan diri sebagai salah satu akademi sains terkemuka di rantau ASEAN.

Meluaskan Jaringan Pakar

Tahun ini, kami telah memilih 29 individu dari kalangan saintis, jurutera dan ahli teknologi yang cemerlang sebagai Felo baru dan 24 orang penyelidik sebagai TRSM. Dengan lebih daripada 581 rangkaian pakar, ASM adalah satu badan dengan kekuatan tersendiri. Saya mengucapkan terima kasih kepada Felo atas semangat dan sumbangan mereka untuk memperbaiki dan mengembangkan lagi usaha kami untuk terus fokus dalam meningkatkan STI di dan untuk Malaysia.

Sekalung Penghargaan

Akademi hanya boleh berjaya melalui sokongan dari MESTECC, dan saya amat berterima kasih kepada semua pemegang taruh, Felo, dan *Associates* yang telah bekerjasama dengan kami dalam pelbagai usaha. Usaha perlu diteruskan dan kami berbangga dengan pencapaian kami ketika ini. Kami akan terus melaksanakan program inovatif dan kajian berimpak tinggi untuk memajukan Malaysia.

Setiap tahun, Laporan Tahunan ASM adalah peluang kami untuk mempamerkan inisiatif yang dilakukan bersama ke arah mencapai objektif kami sebagai Peneraju Pemikir negara. Saya mempersilakan anda untuk membaca laporan tahunan ini bagi memahami misi dan visi kami. Laporan tahunan kali ini sedikit berbeza dari yang sebelumnya.

Selamat membaca.

ANGKA DI SEBALIK 2018

JARINGAN PAKAR

352 FASc

8 KUMPULAN DISIPLIN

- Teknologi Maklumat & Sains Komputer
- Sains Biologi, Pertanian & Alam Sekitar
- Sains Kejuruteraan
- Pembangunan Sains & Teknologi dan Industri
- Sains Perubatan & Kesihatan
- Matematik, Fizik & Sains Bumi
- Sains Kimia
- Sains Sosial & Kemanusiaan

41 *ASSOCIATES*

157 PENERIMA TRSM

67 AHLI YSN-ASM

96 AHLI GABUNGAN YSN-ASM

KAJIAN STRATEGIK

PELAKSANAAN SYOR

SCIENCE OUTLOOK 2017

15 DARI **18** SYOR DI BAWAH **21** **INISIATIF** OLEH KEMENTERIAN, AGENSI, INDUSTRI DAN AKADEMIA

INDUSTRY 4WRD

1 DARI **2** SYOR

JEREBU MERENTASI SEMPADAN

1 DARI **5** SYOR

KESELAMATAN SIBER

5 DARI **5** SYOR

AKTIVITI

267 WACANA

82 LIBAT URUS PEMEGANG TARUH

23 SESI PERKONGSIAN ILMU

10 PROGRAM PERDANA

10 PENERBITAN

370,065 JUMLAH PEMBACA

17 ***ASM SCIENCE JOURNAL***

+2 Special Issue

LIPUTAN MEDIA

157 BERITA **DALAM TALIAN & CETAK**

18,835 KOMUNITI MEDIA SOSIAL

12 **ISU** (SURAT BERITA DIGITAL) **ASM FOCUS**

MENYUARAKAN PANDANGAN, IMPAK BERMAKNA

ANTARA PENGETAHUAN KHUSUS DAN PEMBENTUKAN DASAR

Persekitaran yang mencabar kini tidak boleh dielak. Mengiktiraf kepentingan sains untuk mengemudi dunia yang kompleks ini, ASM memainkan peranan penting dalam menganalisis, membangun, dan memberikan khidmat nasihat sains dan penyelesaian dasar kepada kerajaan. Disokong oleh pengetahuan saintifik dan pakar sains berpengalaman, ASM berusaha menangani isu-isu berkaitan STI yang penting untuk negara dan global, secara bebas, berwibawa, relevan dan tepat pada masanya.

PENGURUSAN SUMBER AIR BERINTEGRASI UNTUK MASA DEPAN YANG LESTARI

Jawatankuasa Air ASM meneruskan kerjasama dengan pihak Kerajaan dalam pelaksanaan *National Integrated Water Resources Management Plan* (NIWRMP). Disebabkan oleh penstrukturan semula kerajaan persekutuan berikutan Pilihanraya Umum ke-14, jawatankuasa tersebut telah mengambil kira perubahan tersebut dan telah menyediakan Adendum bagi laporan *Transformation of the Water Sector: National Integrated Water Resources Management Plan* (NIWRMP) – *Strategies and Road Map* yang telah dilancarkan pada bulan Disember 2016.

Adendum tersebut telah dihantar kepada Kementerian Air, Tanah dan Sumber Asli (KATS), MESTECC dan Kementerian Pertanian dan Industri Asas Tani (MOA) besertakan sebuah memorandum pada bulan Disember 2018.

Perbincangan kumpulan fokus turut diadakan terutamanya berkaitan kesedaran *Integrated Water Resources Management* (IWRM), sokongan dan pembinaan kapasiti serta Neksus Air-Tenaga-Makanan agar topik-topik tersebut dapat dikembangkan menjadi kajian utama pada tahun 2019.

WORLD WATER FORUM KE-8

NIWRMP telah dibentangkan semasa *World Water Forum* ke-8, yang merupakan acara bertemakan sumber air terbesar di dunia yang dianjurkan oleh *World Water Council* (WWC).

WORLD LAKE CONFERENCE KE-17

NIWRMP telah dibentangkan semasa *World Lake Conference* ke-17, yang merupakan persidangan bertaraf dunia tentang pengurusan tasik dan lembangan.

Pembentangan ASM di kedua-dua acara ini menunjukkan bahawa Malaysia bersedia untuk melaksanakan pelan ini di peringkat kebangsaan.

- Baca laporan NIWRMP di sini.
- Baca adendum di sini.

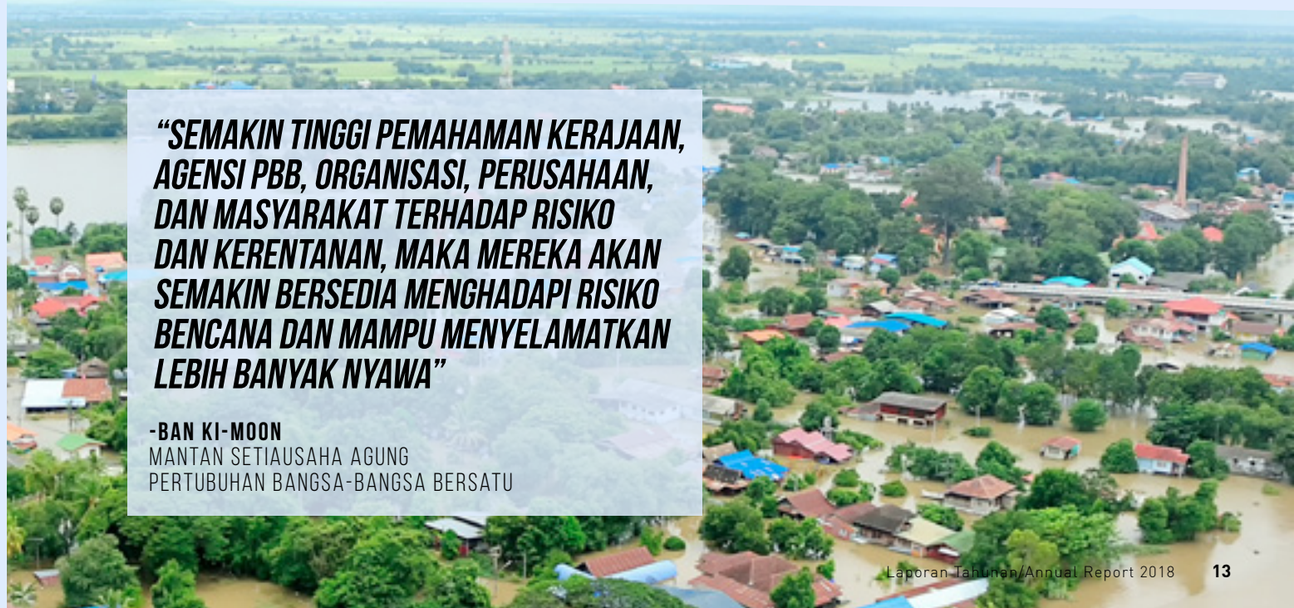
MENYATUPADUKAN KOMUNITI SAINTIFIK *DISASTER RISK REDUCTION* (DRR) MALAYSIA MELALUI PERIKATAN

Disaster Risk Reduction Research Alliance Committee (DRR Research Alliance) telah ditubuhkan untuk menyokong komuniti saintifik di Malaysia mengenai pengurusan bencana. Bekerjasama dengan Agensi Pengurusan Bencana Negara (NADMA), ASM telah menganjurkan Persidangan Kebangsaan Sains, Teknologi dan Inovasi Bagi Pengurangan Risiko Bencana yang pertama pada 5-6 Oktober 2017 untuk memudahkan interaksi antara penyelidik, penggubal dasar, pengamal dari kerajaan, masyarakat, dan industri mengenai pengurusan bencana .

DRR Research Alliance turut bertindak sebagai platform untuk mengumpulkan penyelidik utama serta pemegang taruh dalam bidang DRR untuk menjalankan projek utama yang diterajui oleh ASM. Pakatan ini dipengerusikan oleh Profesor Joy Jacqueline Pereira FASc, dengan sokongan Profesor Emerita Datuk Mazlan Othman FASc dan Ir Dr Zuhairi Abd Hamid FASc serta wakil-wakil dari NADMA Malaysia, Jabatan Meteorologi Malaysia, Pusat Kajian Bencana Asia Tenggara Universiti Kebangsaan Malaysia (SEADPRI-UKM), Universiti Sains Malaysia (USM), Universiti Teknologi Malaysia (UTM), Universiti Utara Malaysia (UUM), Universiti Malaysia Sabah (UMS) dan Universiti Tenaga Nasional (UNITEN).

DRR Research Alliance telah bermesyuarat sebanyak dua kali pada tahun 2018 dan pencapaian yang dikecapi adalah seperti berikut:

- Pengulasan kertas kerja Persidangan Kebangsaan Sains, Teknologi dan Inovasi yang pertama. Kertas kerja tersebut akan diterbitkan dalam Jurnal ASM pada tahun 2019;
- Pengumpulan input berkenaan Pelan STI Negara untuk DRR daripada para penyelidik dalam bidang DRR di Malaysia. Input tersebut telah disampaikan kepada NADMA Malaysia;
- Perbincangan pelan untuk menonjolkan inisiatif DRR Malaysia di peringkat dunia dengan penganjuran dua persidangan strategik di Malaysia dengan kerjasama NADMA Malaysia, SEADPRI-UKM, UNISDR serta rakan strategik yang lain;
- Penerokaan peluang kerjasama *International Science Council Regional Office for the Asia Pacific* (ISC-ROAP) untuk menubuhkan data akses terbuka berkaitan DRR untuk menyokong usaha amaran awal berasaskan komuniti, yang bertunjangkan S&T.



"SEMAKIN TINGGI PEMAHAMAN KERAJAAN, AGENSI PBB, ORGANISASI, PERUSAHAAN, DAN MASYARAKAT TERHADAP RISIKO DAN KERENTANAN, MAKA MEREKA AKAN SEMAKIN BERSEDIA MENGHADAPI RISIKO BENCANA DAN MAMPU MENYELAMATKAN LEBIH BANYAK NYAWA"

-BAN KI-MOON
MANTAN SETIAUSAHA AGUNG
PERTUBUHAN BANGSA-BANGSA BERSATU

***SCIENCE OUTLOOK* 2017:** KE ARAH MENCAPAI MALAYSIA PROGRESIF 2050

Diterajui para Felo dan *Associates* ASM, *Science Outlook 2017* meneliti kemajuan Malaysia dalam STI untuk merealisasikan aspirasi Malaysia sebagai salah sebuah negara yang kreatif dan berinovasi. Bertemakan "Ke Arah Mencapai Malaysia Progresif 2050", pemahaman STI perlu dipertingkat untuk mengubah hala tuju STI dalam negara.

Aspirasi Malaysia untuk menjadi negara maju memerlukan kapasiti untuk membangunkan modal pengetahuan dalam semua sektor. STI telah menyokong pertumbuhan ekonomi negara selama enam dekad sejak mencapai kemerdekaan dan ianya harus dilihat sebagai pemangkin untuk memacu ekonomi baru.

Science Outlook 2017 mengekalkan enam teras strategik daripada edisi sebelumnya. Teras ini adalah berdasarkan NPSTI 2013-2020. Penemuan kajian ini telah dibentangkan semasa pelancarannya pada April 2018.

Mantan Menteri MOSTI, Datuk Seri Panglima Wilfred Madius Tangau melancarkan Science Outlook 2017. Turut bersama, Presiden ASM, Professor Datuk Dr Asma Ismail FASc, dan Pengerusi Science Outlook 2017, Professor Datuk Dr Halimaton Hamdan FASc.

6 **TERAS** STRATEGIK

1 TADBIR URUS STI

Perpecahan dalam ekosistem STI semasa masih menjadi halangan utama yang melumpuhkan kecekapan dan fungsi penyampaian perkhidmatan untuk menyokong ekosistem inovasi. Secara keseluruhannya, membuat keputusan dan mencipta kekayaan yang optimum tidak dapat dicapai kerana pertindihan dalam pengagihan sumber dan ketidakcekapan pemegang taruh dan instrumen sokongan.

Penemuan bagi teras ini diharapkan dapat meningkatkan keberkesanan tadbir urus STI dalam negara sejak 15 tahun yang lalu, yang menyebabkan kemunduran STI di Malaysia.

2 PENYELIDIKAN, PEMBANGUNAN & PENGKOMERSILAN

Malaysia telah memanfaatkan pengetahuan secara aktif untuk memacu ekonomi sejak lebih daripada dua dekad lalu.

Walaupun menerima peruntukan tahunan dari sektor awam dan swasta, usaha Malaysia dalam bidang Penyelidikan, Pembangunan dan Pengkomersilan (P,P&P) seolah terbantut. Malaysia cemerlang dalam penyelidikan gunaan, namun kekurangan pembangunan eksperimental menunjukkan pengkomersilan produk dan perkhidmatan dari hasil kajian adalah rendah.

3 BAKAT STI

Masalah kemerosotan bilangan pelajar yang meneruskan pengajian dalam bidang STEM di institusi pengajian tinggi sangat membimbangkan kerana Malaysia mungkin bakal menghadapi kekurangan bakat yang cekap teknologi ketika negara menuju ke arah revolusi industri yang seterusnya.

Dalam anggaran lima juta pelajar yang mendaftar di sekolah rendah dan menengah, hanya kira-kira 100,000 pelajar akan memilih subjek yang berkaitan dengan STEM, malahan kurang dari jumlah tersebut meneruskan pengajian ke peringkat lebih tinggi dalam bidang STEM. Bilangan ini dijangka akan terus merosot jika tiada langkah diambil untuk meningkatkan minat pelajar terhadap subjek berkaitan STEM.

Bakat STEM di Malaysia juga didapati tidak dimanfaatkan kerana kekurangan kecekapan yang tepat dan bayaran gaji yang tidak setimpal.

4 STI MENTENAGAKAN INDUSTRI

Dari segi daya saing global, Malaysia berada di posisi yang baik; namun perlu mengambil kira bahawa sebanyak 98.5% perniagaan di Malaysia terdiri daripada pengusaha kecil dan sederhana (PKS). Oleh itu, kapasiti industri, infrastruktur, kecekapan tenaga kerja dan penggunaan teknologi perlu dipertingkat agar Malaysia mampu bersaing di arena antarabangsa.

Kajian ini mengenal pasti bahawa ekosistem negara tidak dapat meningkatkan keupayaan inovatif Malaysia. Hanya 6% syarikat Malaysia adalah pencipta. Ketepuan pasaran akibat lambakan barangan tiruan telah menyebabkan produk yang dihasilkan tidak berkualiti di peringkat antarabangsa.

Model kerjasama strategik untuk merangsang pembangunan teknologi, pengkomersilan dan mempercepat pertumbuhan produktiviti PKS harus ditingkatkan untuk menjadikan PKS sebagai perantara inovasi. Pengantara sedia ada tidak diterajui industri dalam memupuk penyelidikan berasaskan permintaan, menyebabkan ianya tidak berkesan dalam merapatkan jurang inovasi dan menggalakkan inovasi terbuka.

Kelemahan antara pengusaha dan saluran penyebaran pengetahuan berkaitan industri menyukarkan usaha bagi mewujudkan ekosistem inovasi yang berjaya.

5 PEMBUDAYAAN STI

Pembudayaan sains secara tidak formal mempunyai kesan yang lebih besar dalam memupuk masyarakat celik sains. Rakyat Malaysia bernasib baik kerana terdapat pelbagai persekitaran yang sesuai dijadikan sebagai medium pembudayaan STI. Walau bagaimanapun, usaha-usaha bagi memastikan medium ini sentiasa relevan dan menarik kepada pelawat perlu diteruskan.

Kajian mengenai penyiaran awam dalam tempoh tiga bulan menunjukkan bahawa saluran televisyen kerajaan menawarkan pelbagai kandungan berkaitan STI; manakala tiada program STI di saluran swasta.

Selain dari berita tetap dengan kandungan yang berkaitan dengan sains, akhbar-akhbar Malaysia mempunyai bahagian khusus untuk liputan sains; tetapi kandungan liputan ini kurang berbanding liputan politik dan sukan.

Pilihan utama kandungan *YouTube* oleh rakyat Malaysia adalah saluran hiburan dan komedi, dan tiada saluran *YouTube* berkaitan STI menjadi pilihan penonton Malaysia. Trend menunjukkan rakyat Malaysia cenderung ke arah rancangan berasaskan hiburan.

6 HUBUNGAN ANTARABANGSA STRATEGIK STI

Globalisasi telah mengubah bukan sahaja ekonomi dunia, tetapi juga bagaimana sumber saintifik, kakitangan, dan dana penyelidikan tidak lagi dibatasi oleh sempadan geografi dalam meningkatkan pengetahuan saintifik dan mencari penyelesaian kepada isu global. Malaysia dan rakyatnya perlu terus menerajui strategi dalam memposisikan Malaysia di arena antarabangsa.

» • Baca laporan penuh kajian. • Tonton video pelancaran.

18 SARANAN

1. **Memperkukuh perancangan dan penyelarasan sains melalui badan berpusat khusus.**
2. **Menubuhkan platform STI yang rasmi antara Kerajaan Persekutuan dan Negeri di Semenanjung Malaysia serta Sabah dan Sarawak.**
3. **Menitikberatkan pembangunan eksperimental.**
4. **Menubuhkan Agensi Pengurusan Penyelidikan Pelbagai Fungsi (RMA) serta mempertimbang penubuhan Agensi Pengkomersilan Teknologi (TCA).**
5. **Mengenal pasti semula bidang keutamaan PPP negara.**
6. **Membangunkan Kluster Inovasi Serantau.**
7. **Menarik minat dan mengekalkan bakat STEM dengan menawarkan ganjaran dan peluang pembangunan kerjaya secara berterusan.**
8. **Mengutamakan pembangunan kemahiran numerik dan teknikal.**
9. **Membuat penilaian jurang bakat dan kemahiran STEM negara setiap dua tahun.**
10. **Menubuhkan rangkaian kolaboratif yang berpandukan industri untuk mempertingkat penyelidikan berasaskan permintaan, serta penyertaan sektor swasta.**
11. **Memudahkan penyebaran dan pemantauan maklumat berkaitan dengan industri dengan pusat penyimpanan data dan maklumat maya.**
12. **Kerjasama antara sektor kerajaan dan swasta untuk mengemaskini dan menaiktaraf ruangan pembudayaan STI.**
13. **Membentuk pusat media sains maya untuk memantapkan isi kandungan STI di pelbagai platform media.**
14. **Mengutamakan pembentukan rancangan kreatif bertemakan STI.**
15. **Kepimpinan dalam menentukan arah tuju hubungan antarabangsa strategik STI negara.**
16. **Meningkatkan peranan atase sains di kedutaan Malaysia seluruh dunia.**
17. **Memperkukuh hubungan antara Kementerian Luar Negeri (KLN) dan komuniti saintifik negara.**
18. **Memanfaatkan platform perdagangan Malaysia di peringkat antarabangsa untuk meningkatkan kepintaran pasaran dalam industri berasaskan STI.**

PRECISION MEDICINE

SATU RAWATAN BUKAN UNTUK SEMUA

Selama ini, kaedah yang digunakan oleh doktor untuk mengubati pesakit adalah dengan memberikan ubat dan dos yang sama kepada semua pesakit. Perbezaan hasil rawatan sebegini, terutamanya dari segi tempoh pemulihan dan kesan sampingan, menunjukkan bahawa kepelbagaian genetik setiap individu perlu dititikberatkan. Kaedah "satu rawatan untuk semua" tidak boleh dipraktikkan lagi.

Precision medicine merupakan salah satu strategi rawatan dan pencegahan yang memuncul dan kian berkembang, di mana penjagaan kesihatan dikhususkan menurut kepelbagaian genetik, persekitaran, dan gaya hidup individu. Kaedah perubatan yang khusus, yang boleh dijangka, bersifat mencegah dan partisipatori ini mampu wujud kerana revolusi genom masa kini.

Di peringkat global, inisiatif berprofil tinggi dalam *precision medicine* telah dilancarkan, dengan peruntukan berjuta dolar dalam bentuk geran penyelidikan dalam bidang ini. Negara-negara seperti *United Kingdom* dan Amerika Syarikat telah mula meneraju bidang ini, dan syarikat teknologi gergasi juga menunjukkan minat mereka dalam bidang ini dengan pengumuman pelaburan dalam pembinaan dan pemerolehan yang mampu memajukan Kecerdasan Buatan (AI), Pembelajaran Mesin (ML), bioinformatik dan kemajuan penjagaan kesihatan yang lain.

Kini tiba masanya untuk Malaysia menongkah arus seiring dengan perubatan disruptif. Walaupun Malaysia mempunyai kepelbagaian data genomik, kemungkinan hanya 0.01% telah dikaji dan dicirikan. Seiring dengan itu, *Special Interest Group (SIG) on Precision Medicine Initiative* telah diwujudkan oleh Majlis ASM pada 12 September 2017. Profesor Datuk Dr A Rahman A Jamal FASc telah dilantik sebagai Pengerusi SIG tersebut.

SIG ini akan membincangkan dan menentukan kepentingan inisiatif *precision medicine* di Malaysia. Kertas posisi yang komprehensif akan dihantar kepada Kerajaan dalam suku keempat tahun 2019. SIG yang terdiri daripada enam ahli ini telah mengadakan mesyuarat pertama pada bulan November 2018 untuk meninjau dan mengorak langkah dalam bidang ini ke arah Malaysia yang lebih sihat.

PAKATAN MALAYSIA UNTUK TEKNOLOGI *BLOCKCHAIN*

Blockchain dan *Electronic Distributed Ledger Technologies (EDLT)* berpotensi untuk menyokong transaksi masa nyata yang efisien dan selamat merentasi pelbagai sektor, seterusnya menyediakan peluang untuk inovasi disruptif.

Sehubungan itu, ASM telah membentuk *Malaysian Alliance on Blockchain Technology* yang diketuai oleh Datuk Fadilah Baharin FASc. Inisiatif utama pakatan tersebut adalah untuk menghasilkan kertas putih untuk mempersiap Malaysia dalam bidang teknologi *blockchain* dan ELDT dari segi hala tuju dasar strategik, rangkaan kawal selia, piawaian dan sebagainya.

Pakatan tersebut terdiri daripada 17 agensi/ kementerian/entiti neutral seperti berikut:

- ASM
- Bank Negara Malaysia (BNM)
- CyberSecurity Malaysia (CSM)
- Jabatan Perlindungan Data Peribadi (JPDP)
- Universiti Islam Antarabangsa Malaysia (UIAM)
- Perbadanan Ekonomi Digital Malaysia (MDEC)
- Unit Pemodenan Tadbiran dan Perancangan Pengurusan Malaysia (MAMPU)
- Suruhanjaya Komunikasi dan Multimedia Malaysia (MCMC)
- Kumpulan Industri-Kerajaan Malaysia bagi Teknologi Tinggi (MiGHT)
- MIMOS
- Kementerian Hal Ehwal Ekonomi (MEA)
- MESTECC
- Kementerian Kewangan (MOF)
- Kementerian Perdagangan Antarabangsa dan Industri (MITI)
- Encik A Fattah Yatim (entiti neutral)
- Suruhanjaya Sekuriti Malaysia
- Universiti Malaya (UM)

Objektif kertas putih tersebut adalah untuk membolehkan MESTECC menyelaras pelan tindakan pembangunan teknologi *blockchain* di Malaysia dengan menubuhkan Jawatankuasa *Blockchain* Kebangsaan untuk memastikan pelaksanaan berintergrasi dan pelaksanaan yang dipantau di peringkat kebangsaan.

HALAL

TASK FORCE ON THE SCIENCE OF HALAL INITIATIVE IN MALAYSIA

"Halal" - secara amnya bermaksud dibenarkan dalam Islam - meliputi kedua-dua produk dan perkhidmatan. Dengan jangkaan peningkatan populasi Muslim global sebanyak 2.2 bilion menjelang 2030, permintaan barangan dan perkhidmatan halal dijangka akan turut meningkat. Nilai pasaran global untuk perdagangan halal bagi produk makanan dan bukan makanan dianggarkan sebanyak USD2.3 trilion setahun, menjadikan ia salah satu pasaran yang berkembang pesat di dunia.

Menyedari potensi dan impak besar industri halal bagi Malaysia dan keperluan untuk memposisikan industri halal Malaysia secara strategik, ASM pada tahun 2017 menubuhkan *Task Force on the Science of Halal Initiative* yang dipimpin oleh Academician Tan Sri Dato' Ir Ts Ahmad Zaidee Laidin FASc. Objektif badan bertindak ini adalah untuk merumuskan kertas posisi mengenai sains halal.

Berdasarkan penemuan awal, ASM telah menyedari keperluan bagi menyatukan data dan inisiatif sains halal di Malaysia, termasuk maklumat mengenai status penyelidikan semasa dan saintis terlatih dalam bidang berkaitan sains halal dalam negara, serta memahami isu semasa yang dihadapi oleh pemain industri halal yang berpotensi untuk ditangani melalui sains, teknologi dan inovasi.

Dalam mengembangkan industri halal Malaysia agar ia boleh memenuhi permintaan barangan dan perkhidmatan di masa depan, pendekatan halal terbina *(built-in halal approach)* perlu dipertimbangkan di mana STI boleh digunakan melangkaui kawalan kualiti dan ujian.
Pasaran khusus seperti logistik halal perlu dipertimbangkan, di mana teknologi memuncul seperti *blockchain* dapat membantu pengeluar untuk mengesan dan memantau dan memastikan kualiti produk halal lagi baik.

21 Februari 2018:
Halal Science Strategic Planning Workshop 2.0

Bengkel ini bertujuan untuk mengenal pasti isu, cabaran dan cadangan untuk meningkatkan pembangunan STI dalam sektor utama yang dikenal pasti untuk sains halal:

- **Farmaseutikal**
- **Makanan dan minuman**
- **Perubatan dan kesihatan**
- **Kosmetik dan penjagaan diri**

MEMAHAMI PEMBELAJARAN MESIN

Peningkatan penggunaan Kecerdasan Buatan (AI) memberi pelbagai faedah sosial dan ekonomi yang melangkau pelbagai sektor ekonomi. AI membolehkan sistem komputer menganalisis, mempelajari, dan memproses maklumat dengan kelajuan yang luar biasa, jauh melebihi kebolehan manusia.

Kebelakangan ini, kemajuan dalam pembelajaran mesin (ML), salah satu cabang AI yang membolehkan sistem komputer untuk belajar secara terus dari contoh dan pengalaman untuk melaksanakan tugas-tugas tertentu, telah menarik perhatian bidang akademik dan industri.

Menyedari potensi ML untuk Malaysia, ASM telah menubuhkan *Special Interest Group on Machine Learning* (SIG ML) pada Mei 2017. Tujuan inisiatif ini adalah:

- Untuk menentukan perubahan utama di peringkat tempatan, serantau dan global yang akan menggalakkan penggunaan pembelajaran mesin di Malaysia
- Untuk menentukan aplikasi pembelajaran mesin yang boleh dilaksanakan di Malaysia
- Untuk meneroka faktor-faktor utama yang membolehkan penggunaan Pembelajaran Mesin
- Memangkinkan hubungan antara akademia dan industri yang dibantu oleh kerajaan ke arah penggunaan pembelajaran mesin
- Untuk membincangkan cara meneruskan penggunaan pembelajaran mesin di Malaysia

SIG ML terdiri daripada 25 penyelidik dari universiti awam dan swasta serta institusi penyelidikan, dengan bidang penyelidikan berkaitan ML.

3 Mei 2018: SIG ML, dengan kerjasama *Collaborative Research in Engineering, Science & Technology* (CREST), telah menganjurkan bengkel *Strategic Enablement of AI and ML in Malaysia* di USM, Pulau Pinang, dan dihadiri oleh 170 peserta.

2 November 2018: Satu sesi kongsi ilmu bersama Profesor Dr Sarah Barman, pensyarah *Computer Vision* di *Kingston University*, mengenai *Role of AI in Transforming Healthcare* telah diadakan di UIAM.

13 November 2018: SIG ML dengan kerjasama CREST telah menganjurkan syarahan umum bertajuk *Machine Learning for Small and Big Data Analytics in Healthcare and Manufacturing* di UNITEN.

DASAR SAINS, TEKNOLOGI DAN INOVASI NEGARA (DSTIN)

KAJIAN SEMULA DAN FORMULASI

Bagi menyokong aspirasi kerajaan untuk menjadikan Malaysia sebuah negara maju yang berpendapatan tinggi dengan mengarusperdanakan STI, MESTECC telah mengarahkan ASM untuk mengkaji semula DSTIN 2013-2020 dan merangka DSTIN 2021-2030 yang baru. Dato' Profesor Dr Awang Bulgiba Awang Mahmud FASc telah dilantik sebagai Pengarah Projek bagi kajian ini.

Kajian ini dibahagikan kepada dua fasa:
Fasa 1: Kajian Semula (Jul 2017 - Feb 2018)

Semasa proses kajian semula, dasar semasa didapati komprehensif, tetapi ia memerlukan penambahbaikan selanjutnya untuk lebih holistik dan sesuai dengan peredaran masa.

Kajian ini mendapati terdapat 48 dasar dengan elemen STI yang telah diperkenalkan oleh kementerian yang berlainan di negara ini. DSTIN sepatutnya menjadi sebuah dasar mengenai STI yang menyeluruh; namun kementerian lain tidak menyedari bahawa dasar sedemikian telah dirangka. Di samping itu, hanya tiga daripada 48 dasar ini mengandungi penanda boleh ukur. Kekurangan kejelasan juga terbukti dalam pemerolehan beberapa data statistik. Dokumen ini boleh menyampaikan langkah-langkah dasarnya dengan lebih jelas.

Kajian semula juga mendapati sistem semasa tidak mempunyai badan tadbir urus yang berdedikasi untuk memastikan sistem pengawasan yang lebih teratur. Untuk memastikan pendekatan yang lebih berkesan, adalah penting bagi dasar ini untuk menerangkan peranan dan tanggungjawab agensi yang terlibat.

Fasa 2: Kajian Formulasi (Mac - Dis 2018)

Dikenali sebagai *Future Acceleration through Science, Technology and Research Excellence* 2021-2030, dasar baru ini digubal ketika Fasa 2 dengan matlamat memperkaya kehidupan, mengembangkan minda, dan membentuk masa hadapan. Ia direka untuk meneraju Malaysia ke arah menjadi sebuah negara yang mahir dan lebih berdaya saing yang dibina dengan asas STI yang kukuh.

Future Acceleration through Science, Technology and Research Excellence (FASTREx) *2021-2030*

6 TERAS STRATEGIK

MENGINSTITUSIKAN TADBIR URUS STI

Menginstitusikan Tadbir Urus STI Negara melalui Rangka Kerja Perundangan dan Pengawalseliaan

01

MEMAJUKAN P, P & P

02 Merealisasikan Output P, P & P yang Ditambah Nilai

MEWUJUDKAN BAKAT ALIRAN STEM UNTUK MALAYSIA YANG MAJU

Memperkukuhkan Bakat STEM untuk Tenaga Kerja Masa Hadapan

03

MENTENAGAKAN INDUSTRI

04 Mengasah Daya Saing ke arah Ekonomi Berasaskan Inovasi yang Dipercepat

PEMBUDAYAAN STI

Memupuk Masyarakat Berfikiran Sains dalam Kehidupan

05

MENCAPAI KEUNGGULAN GLOBAL MELALUI PAKATAN STRATEGIK ANTARABANGSA

06 Rakan Kongsi STI Global Pilihan dalam Pakatan Antarabangsa

KAJIAN PELAN INDUK SAINS, TEKNOLOGI & INOVASI NEGARA (STIMP) 2020-2030

Dalam usaha mengarusperdanakan STI untuk kemajuan sosio-ekonomi negara, MESTECC telah dimandatkan oleh Kerajaan untuk merangka Pelan Induk STI Negara untuk menyokong pelaksanaan semua dasar yang berkaitan STI (STI untuk Dasar) serta merealisasikan Agenda Sains Negara dan memanfaatkan peluang STI untuk mencapai pertumbuhan ekonomi berpaksikan Rakyat.

ASM sebagai agensi bersifat bebas dan terdiri dari Felo berkepakaran tinggi telah dilantik sebagai rakan strategik dalam merangka Pelan Induk STI Negara 2020-2030 dari 1 Julai 2017 hingga 31 Disember 2018. Dato' Dr Rahmah Mohamed FASc telah dilantik sebagai Pengarah Projek pada tahun 2016.

Kajian tersebut telah dijalankan berdasarkan lima bidang fokus yang dikenal pasti daripada laporan *Organisation for Economic Co-operation and Development* (OECD) tentang Profil Inovasi Malaysia (2013) iaitu Tadbir Urus, Bakat, Industri, Infrastruktur serta Ekonomi dan Kewangan. Bidang fokus ini perlu ditambahbaik untuk memajukan STI negara. Setiap bidang fokus diketuai oleh Felo dan *Associates* ASM. Sepanjang tahun 2018, beberapa sesi bersama pelbagai pemegang taruh seperti ahli industri, akademia, penggubal dasar serta ahli masyarakat telah diadakan dengan objektif berikut:

- Mengenal pasti isu, kelemahan dan cabaran STI dalam lima Bidang Fokus.
- Mengesahkan strategi dan pelan tindakan untuk menangani isu yang dikenal pasti.

Teras utama pelan induk ini adalah untuk mengenal pasti situasi di mana kolaborasi dan kerjasama antara pelbagai pemegang taruh dapat dipraktikkan sepenuhnya tanpa melupakan tujuan utama pelan induk tersebut iaitu untuk menjaga kesejahteraan rakyat Malaysia.

Tadbir Urus
Struktur tadbir urus yang kukuh adalah penting untuk memandu dan menambahbaik spektrum pengurusan STI, pembiayaan, pemantauan, penilaian dan ideasi serta mengenal pasti teknologi dan trend pasaran global. Penyelarasan usaha oleh semua pemegang taruh dan instrumen sokongan amat penting dalam membentuk ekosistem STI berintegrasi yang berprestasi tinggi, berkolaborasi tinggi serta mengurangkan penindihan.

Bakat
Bakat merupakan pemacu ekosistem STI yang kukuh dan dinamik untuk menyokong pencapaian visi Malaysia sebagai negara berpendapatan tinggi. Perubahan signifikan perlu dibawa dari segi pembangunan bakat, kemahiran semula, serta meningkatkan kemahiran bakat sebelum dan setelah memasuki bidang pekerjaan.

Industri
Industri perlu berubah dengan mempraktikkan teknologi pintar dan berhubung melangkau Industri 4.0. Selain itu, industri juga perlu melabur dalam tenaga kerja berkemahiran tinggi. Kerjasama industri-akademia juga merupakan ciri penting yang perlu untuk menyokong penyelidikan dan pembangunan berasaskan keperluan agar jurang inovasi dapat dirapatkan dengan memberi hala tuju yang jelas serta memaksimakan pulangan pelaburan.

Infrastruktur
Infrastruktur STI mengupas tentang pembangunan ekonomi yang adil dan saksama melalui perkhidmatan, kemudahan dan sistem asas dari segi Digital, Fizikal, Alam Sekitar, Penyelidikan, Pembangunan, Pengkomersilan dan Inovasi (RDCI) serta Infrastruktur Sosial.

Ekonomi dan Kewangan
Meneroka mekanisme/model yang baru dan diperbaharui dalam instrumen kewangan untuk STI melibatkan kajian terperinci mekanisme pembiayaan dan ekonomi sedia ada, dan pengenal pastian jurang/ kekurangan yang perlu ditangani dan ditambah baik.

DASAR DAN PELAN INDUK STI MALAYSIA 2021-2030

Sebuah jawatankuasa diketuai oleh Professor Datuk Dr Asma Ismail FASc dan dibantu oleh Dr Helen Nair FASc ditubuh untuk melaksanakan sesi pemurniaan bagi kajian NPSTI 2021-2030 dan STIMP 2020-2030. Tujuan sesi pemurnian ini dilaksanakan adalah untuk menghasilkan dasar dan pelan induk STI negara yang saling melengkapi (seperti *Malaysia Policy and Master Plan on STI* 2021-2030). Sesi pemurnian ini akan dilaksanakan dalam suku pertama 2019.

Pasca PRU ke-14, Menteri dan Timbalan Menteri MESTECC, YB Puan Yeo Bee Yin and YB Puan Isnaraissah Munirah Majilis, yang baru dilantik, melawat ASM pada 19 Julai 2018. Mereka diberi pengenalan mengenai fungsi dan peranan ASM sebagai Badan Pemikir untuk STI. Ahli EXCO ASM yakin dan sedia bekerjasama dengan Kementerian dalam mengarusperdanakan Agenda STI melalui sains untuk polisi dan polisi untuk sains.

TINJAUAN SEPARUH PENGGAL PELAN PEMBANGUNAN PENDIDIKAN MALAYSIA 2015-2025 (PENDIDIKAN TINGGI)

Pelan Pembangunan Pendidikan Malaysia 2015 -2025 (Pendidikan Tinggi) merupakan pelan transformasi 11 tahun pendidikan tinggi Malaysia yang direka untuk mendorong pemegang taruhnya seiring, jika bukan lebih awal, dengan cabaran dan trend global melalui sepuluh lonjakan yang akan direalisasikan melalui 32 strategi dan 71 inisiatif.

Kajian ini dijalankan bagi mengkaji semula tahap dan keberkesanan pelaksanaan, pencapaian semasa, dan cabaran dari sepuluh lonjakan pelan ini. Kajian ini juga akan memberikan pandangan kepada kajian dasar peringkat kebangsaan dan mencadangkan penambahbaikan kepada hala tuju, strategi dan inisiatif pelan ini.

Penemuan kajian yang diketuai oleh Profesor Ir Abdul Aziz Abdul Raman FASc ini akan dibentangkan kepada Jawatankuasa Kajian Dasar Pendidikan Negara (JKD), sebuah badan bebas yang ditubuhkan oleh Kementerian Pendidikan Malaysia (KPM). JKD adalah sebuah jawatankuasa yang dianggotai oleh 13 orang pakar untuk mengkaji dasar pendidikan negara dari Oktober 2018 hingga April 2019.

10 LONJAKAN

1. Graduan Holistik, Berciri Keusahawanan dan Seimbang
2. Kecemerlangan Bakat
3. Menghayati Pembelajaran Sepanjang Hayat
4. Graduan Pendidikan dan Latihan Teknikal dan Vokasional (TVET) Berkualiti
5. Kemampanan Kewangan
6. Pemantapan Tadbir Urus
7. Ekosistem Inovasi
8. Keunggulan Global
9. Pembelajaran dalam Talian Tahap Global
10. Transformasi Penyampaian Pendidikan Tinggi

KAJIAN IMPAK PELAKSANAAN UNIVERSITI PENYELIDIKAN MALAYSIA

Universiti Penyelidikan Malaysia (MRU) adalah penggerak utama ekosistem inovasi kebangsaan dan ekonomi pengetahuan Malaysia. Universiti-universiti ini juga menggalakkan pertumbuhan ekonomi, daya saing industri tempatan, dan meningkatkan kesejahteraan sosioekonomi rakyat. Pada September 2006, UKM, USM, UM dan Universiti Putra Malaysia (UPM) dinamakan sebagai kumpulan perintis MRU. UTM mencapai status MRU kelima pada tahun 2010.

Kajian yang dipengerusikan oleh Profesor Dr Mahendhiran Sanggaran Nair FASc ini bertujuan untuk menilai semula peranan, impak dan hala tuju MRU. MRU adalah pemangkin utama dalam mengubah Malaysia menjadi pusat kecemerlangan pendidikan dan penyelidikan serantau dan global. Oleh itu, analisa kritikal mengenai pencapaian semasa, prestasi, isu, cabaran dan jurang akan disediakan.

Tinjauan perbandingan berkenaan impak dan hasil global RU luar negara akan dijalankan dan cadangan untuk memperkukuhkan ekosistem penyelidikan dalaman MRU akan dilaksanakan. Kajian ini juga akan mencadangkan satu rangka kerja strategik untuk mengukuhkan kerjasama penyelidikan antara MRU bagi mengukuhkan keupayaan jaringan pengetahuan yang akan meningkatkan ekosistem inovasi kebangsaan dan daya saing global Malaysia.

KHIDMAT INPUT STRATEGIK

Akademi memberikan input strategik kepada kementerian dan agensi kerajaan berdasarkan kajian ASM terdahulu dan semasa yang diketuai oleh Felo ASM yang pakar dalam bidang berkaitan.

MESTECC
- MJM Kementerian Belia dan Sukan: Semakan Semula Jawatankuasa Kabinet Pembangunan Belia
- Draf Akhir Laporan Kajian Pembangunan Pelan Induk Kebangsaan Pendidikan dan Latihan Teknikal dan Vokasional (TVET) ke Arah Negara Maju
- Mesyuarat Penyelarasan Status Pencapaian Semasa KPI 500 Set Data Terbuka
- NJM MESTECC: Pembangunan Industri Mobiliti Elektrik
- *MESTECC ICoE Nexus Initiative*
- Bahan Rujukan atau Maklumat Berkaitan STI Enculturation
- MJM KeTTHA: Pelan Halatuju Industri Solar Malaysia 2030
- *Minister of STI's Column 'Recognising Scientists'*
- Bengkel Pengukuhan Tadbir Urus Ekosistem RDCI Negara
- Bengkel Pemurnian Senarai Pekerjaan S&T dan STEM

Malaysia Power Nuclear Corporation
- Kaji Selidik Penerimaan Awam Terhadap Penggunaan Tenaga Nuklear Sebagai Salah Satu Sumber Janaan Elektrik Negara

PEMANDU Associate
- *Discussion on TN50 Study for Plantation and Commodities Sector*

TN50 OGEE Committee Members
- *Discussion on TN2050 Oil, Gas, Energy and Environment (OGEE)*

Agensi Keselamatan Siber Negara
- Bengkel Semakan Semula Dasar Keselamatan Siber Negara dan Pembangunan Strategi Keselamatan Siber Negara

Invest Selangor
- Sesi Percambahan Fikiran untuk Kajian dan Penyediaan Pelan Tindakan Hala Tuju Industri Halal Negeri Selangor

MIGHT
- *Malaysia Blockchain and Distributed Ledger Technology Outlook 2019 Report: Blockchain in Government Consultative Session*

MITI
- *Workshop on Developing the Implementation Plan of National Industry 4.0 Policy Framework (Industry 4WRD)*

Kementerian Air, Tanah dan Sumber asli
- Bengkel Penyediaan Terma Rujukan bagi Kajian Dasar Air Negara

MyIPO
- Sesi Konsultansi Penambahbaikan Dasar Harta Intelek Negara

Malaysian Water Partnerships
- *Malaysia Water Resources Management Forum*

MESTECC dan Malaysian Green Technology Corporation
- Input mengenai Kereta Nasional ketiga kepada YB Menteri MESTECC

KHIDMAT NASIHAT KEPADA KERAJAAN

ASM telah merangka tiga memorandum dalam usaha menyempurnakan mandat sebagai peneraju pemikir dalam STI.

MEMORANDUM TADBIR URUS STI

ASM percaya bahawa tadbir urus STI sangat penting bagi memimpin dan meneraju agenda strategik STI negara untuk meningkatkan produktiviti, pertumbuhan dan transformasi sosial. Memorandum ini mengenal pasti tiga cabaran utama: tadbir urus STI yang lemah, landskap STI yang terbahagi dan tidak bersambung, dan pengagihan sumber yang tidak sekata dan tidak memberi impak yang signifikan.

Memorandum ini telah disampaikan kepada YAB Perdana Menteri pada 11 Jun 2018.

Presiden ASM telah bertemu dengan YAB Perdana Menteri pada 24 Julai 2018.

MEMORANDUM EKOSISTEM INOVASI MALAYSIA

Memorandum ini menekankan keperluan ekosistem inovasi yang berfungsi sepenuhnya bagi merapatkan jurang inovasi untuk Malaysia yang progresif, makmur, harmoni dan mampan berdasarkan kemajuan S&T. Ia turut menyatakan bahawa peranan STI adalah kritikal dalam memulakan dan mengekalkan pembangunan ekonomi dan masyarakat berasaskan pengetahuan. Di samping itu, rangkaian kolaboratif inovasi dapat menggabungkan kepakaran kreatif yang kebanyakannya tidak diterokai dalam lingkaran empat pihak, untuk pembangunan ekonomi pesat yang akan memulakan transformasi sosial yang meluas.

Memorandum ini telah disampaikan kepada Majlis Penasihat Kerajaan (CEP) pada 9 Julai 2018.

ASM telah membentangkan Memorandum tersebut kepada CEP pada 19 Julai 2018.

INPUT REFORMASI INSTITUSI TADBIR URUS STI YANG LEBIH BERKESAN

Input ini menekankan keperluan pembaharuan institusi yang diperlukan untuk tadbir urus STI yang lebih baik bagi mewujudkan ekosistem STI negara yang berkesan dan cekap. Input ini juga berfungsi untuk mengkaji semula dan menyelaraskan mandat, peranan dan fungsi institusi utama dalam landskap STI Malaysia dengan tujuan menghasilkan tadbir urus, amalan membuat keputusan dan pengagihan sumber yang lebih efektif.

Input ini telah disampaikan kepada Jawatankuasa Pembaharuan Keinstitusian pada 25 Mei 2018.

PENGLIBATAN SAINTIS, MEMPERKASA MASYARAKAT

ASM MENEKANKAN PERANAN PENTING SAINS TERHADAP KESEJAHTERAAN MASYARAKAT DENGAN MELAKSANAKAN PROGRAM SAINTIFIK DEMI KEBAIKAN MASYARAKAT.

Sains sentiasa dikaitkan sebagai bidang yang sukar dan berasaskan buku teks, menjadikan masyarakat hilang minat terhadap subjek itu. Sebenarnya, sains adalah satu subjek yang menarik, yang mendorong kehidupan seharian kita – dan inilah mesej yang ASM cuba sampaikan melalui inisiatif yang dijalankan.

ASM juga memperkasakan komuniti saintifik dengan menganjurkan pelbagai program melalui kerjasama dengan institusi dan organisasi kebangsaan dan antarabangsa.

MEMBENTUK BAKAT STEM MASA HADAPAN

National Science Challenge (NSC) telah mengalami pelbagai perubahan dan penambahbaikan dari segi isi kandungannya, seiring dengan perkembangan bidang sains terkini. Sebagai salah sebuah pertandingan sains yang signifikan di peringkat sekolah menengah, NSC bertujuan membangunkan kapasiti, keupayaan dan kompetensi generasi muda dalam bidang STEM, bagi melahirkan pemimpin yang mempunyai kemahiran yang diperlukan untuk menempuh cabaran di masa depan.

PERINGKAT NEGERI: Pasukan *Wild Card* (gabungan tiga pelajar dengan markah individu tertinggi dalam satu pasukan) serta sesi pembentangan topik STEM dalam tiga minit telah meningkatkan lagi keupayaan berkomunikasi.

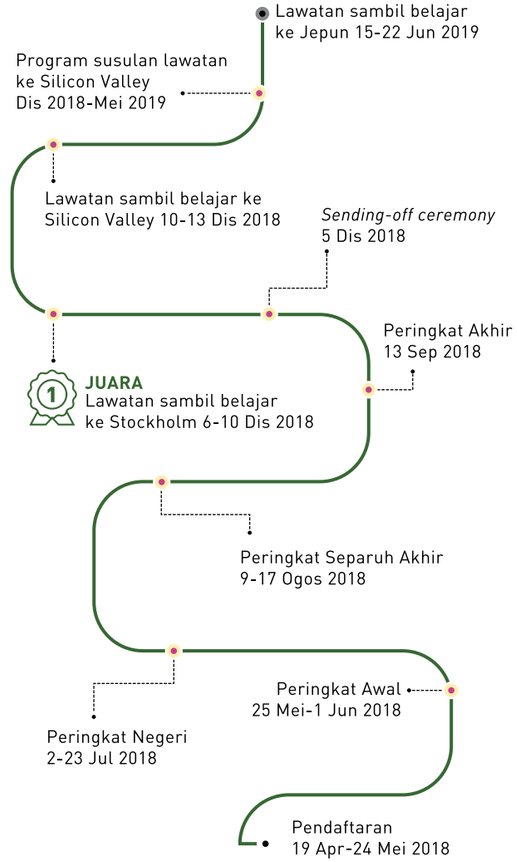
PERINGKAT SEPARUH AKHIR: Tahun ini, kem sains bertemakan "Komuniti Pintar" telah diadakan selama tujuh hari. Peserta telah berpeluang mempelajari teknik pemikiran saintifik, meneroka falsafah dan aplikasi topik berkaitan komuniti pintar, serta membangunkan ciptaan yang boleh membentuk dan menyokong komuniti pintar. Peserta juga telah mempelajari teknik penyampaian efektif melalui sesi pembentangan ciptaan mereka bersama sekumpulan saintis muda.

PERINGKAT AKHIR: Empat kumpulan terbaik akan mara ke peringkat akhir, di mana mereka akan diuji melalui kuiz sains yang interaktif, dan juga menunjukkan kebolehan penyampaian umum secara efektif.

Tempat pertama: Piala Pusingan Perdana Menteri, hadiah wang tunai serta lawatan sambil belajar ke Stockholm, Sweden.

Tempat kedua: Hadiah wang tunai dan lawatan sambil belajar ke *Silicon Valley*, USA.

Tempat ketiga dan keempat: Hadiah wang tunai, dan peluang lawatan sambil belajar ke Jepun di bawah *Sakura Science Exchange Programme*.



6,450
PENYERTAAN PELAJAR 2018

JUARA
SMK KING GEORGE V, SEREMBAN

TEMPAT KE-2
MRSM TUN ABDUL RAZAK, PAHANG

TEMPAT KE-3
KOLEJ YAYASAN SAAD, MELAKA

TEMPAT KE-4 PASUKAN *WILD CARD*
KEDAH, DIWAKILI PELAJAR DARI SMJK SIN MIN, MRSM LANGKAWI & MRSM KUBANG PASU

• Lawati galeri foto. • Baca liputan akhbar. • Ikuti media sosial NSC.

MEMUPUK PERSAHABATAN ANTARA NEGARA ASEAN MELALUI SAINS

Malaysia telah dilantik menjadi tuan rumah untuk *7th ASEAN Plus Three Junior Science Odyssey* (APT JSO). Peserta dari negara ASEAN serta Korea Selatan telah tiba di Malaysia untuk pertandingan selama empat hari yang terdiri daripada *Great Science Pitch, Great Science Quest* dan *Great Science Ideas*. Ahli YSN-ASM turut menyokong program ini dengan mengajar para peserta teknik komunikasi sains yang efektif.

Pertandingan tersebut telah dianjurkan oleh MESTECC, ASM dan YSN-ASM dengan kerjasama UPM dan beberapa kementerian dan agensi kerajaan.

Selain daripada aktiviti di atas, APT JSO turut mengadakan Malam Kebudayaan. Kepelbagaian budaya negara-negara ASEAN dan Korea Selatan diraikan semasa *Great Cultural Night* melalui tarian, nyanyian, pakaian tradisional.

APT JSO telah memupuk minat peserta dalam bidang STEM, serta memberi peluang untuk mereka meluaskan rangkaian, memupuk persahabatan serta pertukaran budaya.

Great Science Pitch | ***Great Science Ideas*** | ***Great Science Quest*** → **Modul APTJSO ke-7**

7th APT JSO // 29 Julai - 3 Ogos 2018 // UPM

- Peserta dari sembilan buah negara:
  - 19 pasukan
  - 18 orang guru
  - 57 orang pelajar
  - 3 orang pemerhati

1

JUARA
Filipina
Pasukan B
(Philippines Science High School, Soccsksargen Region)

2

TEMPAT KE-2
Malaysia
Pasukan D
(Sekolah Menengah Sains Kuching)

3

TEMPAT KE-3
Korea Selatan
Pasukan B

• Lawati galeri foto. • Tontoni video sorotan. • Baca liputan ASM.

MEMBENTUK MINDA, MENGHASILKAN CIPTAAN

SAINS MENYATUKAN, INOVASI MENENTUKAN

Buat kali kedua, Malaysia telah dijemput untuk menyertai *2nd One Belt One Road Teenager Maker Camp & Teacher Workshop*, oleh *China's Children & Youth Science Center of CAST* (CYSC).

Pelajar dari Sekolah Menengah Sains Kuching yang telah meraih kemenangan semasa *7th APT JSO* telah dipilih untuk mewakili Malaysia ke pertandingan ini.

Pelbagai ciptaan telah dihasilkan melalui pertandingan ini, sebagai contoh: model skala rumah yang diilhamkan oleh senibina Turki, dan juga penghasilan video dengan menggunakan teknologi realiti maya. Wakil Malaysia dari Bumi Kenyalang telah banyak mempelajari kaedah dan kemahiran membangunkan rekacipta STEM. Mereka juga telah memenangi Anugerah Semangat Berpasukan Terbaik dan Pencipta Terbaik tahun ini.

Tahun ini, delegasi Malaysia turut berpeluang untuk berkongsi kisah kejayaan tentang inisiatif Pendidikan Sains Berasaskan Inkuiri (IBSE) melalui forum yang bertemakan pendidikan sains.

2nd One Belt One Road Teenager Maker Camp & Teacher Workshop // 15-21 November 2018 // Beijing, China

• Lawati galeri foto.
• Tonton video sorotan.
• Baca liputan ASM.

PENCIPTA MUDA

Minda generasi muda mengandungi idea-idea yang masih menunggu untuk dicungkil dan dipraktikkan. Idea-idea yang terkandung ini mungkin merupakan kunci kepada menyelesaikan isu-isu global dan serantau. Sumber berharga ini perlu dimanfaatkan dan direalisasikan sebaiknya. Sehubungan itu, *Young Makers Programme* merupakan salah satu acara untuk menemui bakat-bakat muda dalam bidang inovasi.

Young Makers Programme terdiri daripada kem inovasi yang mengajar peserta kemahiran membangunkan projek-projek inovasi, pengaturcaraan, pemikiran reka bentuk, dan pemprototaipan. Peserta dapat berinteraksi dengan pakar-pakar dari industri dan universiti yang bertindak sebagai mentor dan menyampaikan pengetahuan dan kepakaran bidang masing-masing. Di samping itu, pakar-pakar ini juga mengajar menyelaraskan kehendak pasaran dengan pembangunan STI terkini.

DUA KATEGORI:

5 Sekolah

ARDUINO

SMK Abdullah Munshi
- Kit pengawasan untuk golongan warga emas

SM Sains Tun Syed Sheikh Shahabudin
- Alat Pengukur Aras Minyak dalam Tangki Bawah Tanah

MICROSCALE CHEMISTRY

MRSM Transkrian
- Tahap pH yang Optimum untuk Sabun Kalamin Menyembuhkan Penyakit Kulit

MRSM Balik Pulau
- *The Safest Water during Drought*

SMK Penang Free
- Kit Skala Mikro ke Atas Pelbagai Ujian Kimia

14 Sekolah

4 Sekolah

Fasa 1
Pre-bootcamp 2018
10-11 Okt 2018

- Taklimat program
- Pemikiran Pengkomputeran
- Latihan Teknikal
- Ceramah Kesedaran STEM

Fasa 2
Makers Innovation Challenge
20 Okt 2018

- *Makers Innovation Makeathon*
- Penutup dan Majlis Penyampaian Hadiah

69 ORANG PELAJAR DARI
23 BUAH SEKOLAH (BAHAGIAN UTARA)

• Lawati galeri foto. • Baca liputan ASM.

"STEM" UP YOUR GAME!

Apabila sebuah syarikat berhasrat memupuk minat STEM dalam kalangan kanak-kanak bertemu dengan sebuah organisasi yang berusaha mengarusperdanakan STEM dalam negara, sebuah program yang memenuhi hasrat kedua-dua pihak dan seterusnya memperkaya pelajar terhasil.

ASM percaya bahawa industri memainkan peranan yang penting dalam memupuk minat terhadap STEM dalam kalangan pelajar sekolah. Melalui YSN-ASM, ASM telah menyokong Syarikat CCM dalam menganjurkan *STEM Up Challenge* dengan jayanya.

Peserta program tersebut telah menduduki kuiz STEM yang komprehensif serta perlu menyiapkan projek sains masing-masing. Sekolah Menengah Perempuan Temenggong Ibrahim tampil sebagai juara program ini. Selain itu, Sekolah Menengah Kebangsaan Seri Gading telah meraih anugerah *Most Outstanding Science Project.*

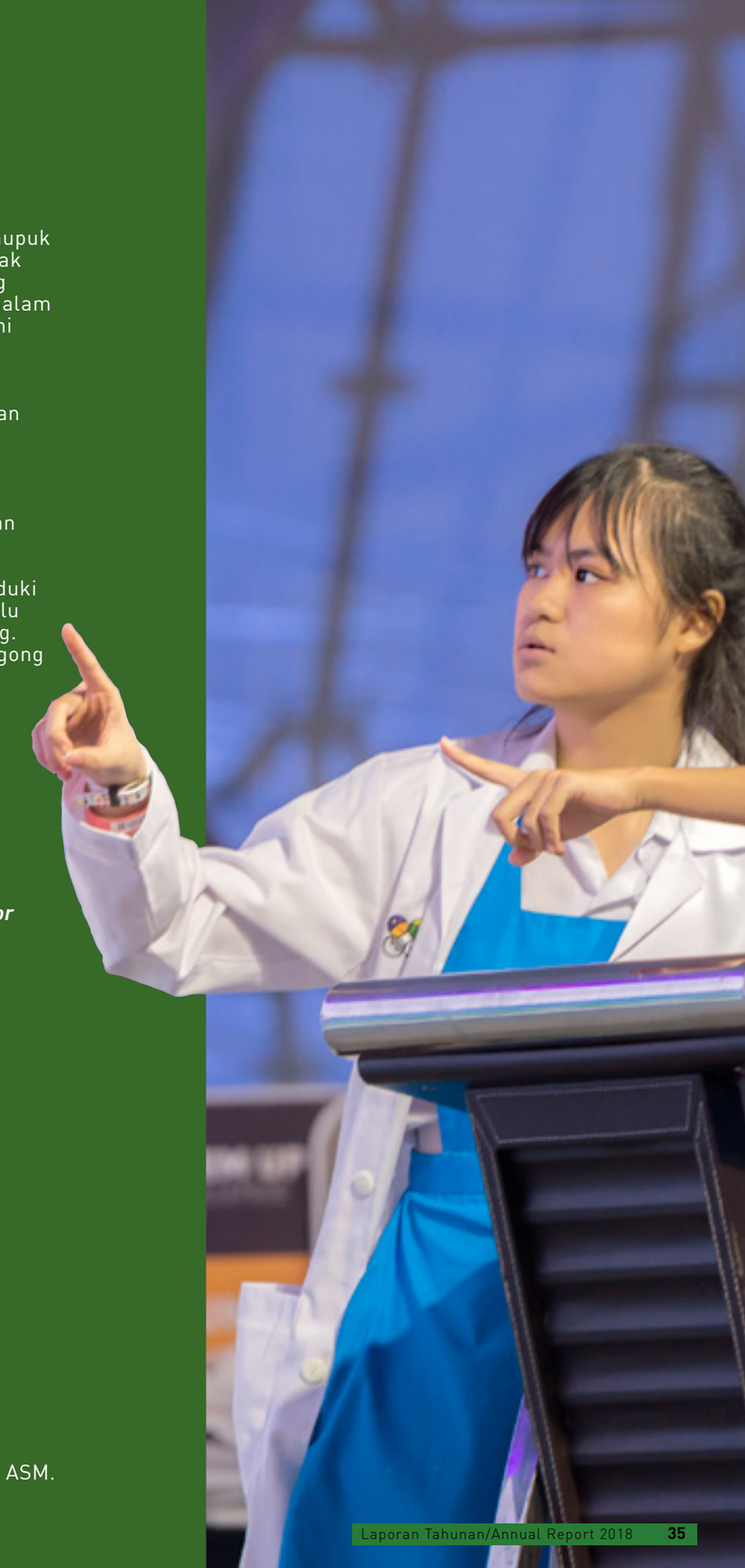
Peringkat Awal: 2–14 April 2018 // Minggu Sains Negara

Peringkat Separuh Akhir dan Akhir: 24 April 2018 // Stadium Batu Pahat, Johor

1,550 PELAJAR (PERINGKAT AWAL)

600 PELAJAR (PERINGKAT SEPARUH AKHIR & AKHIR)

• Lawati galeri foto. • Baca liputan ASM.



MERAPATKAN JURANG ANTARA SAINS DAN MASYARAKAT

Sains adalah menyeronokkan dan menarik. Ia boleh menjadi hala tuju kerjaya yang berdaya maju. Malangnya, ia tidak menarik perhatian masyarakat. Minat rakyat Malaysia terhadap sains didapati rendah berbanding negara lain.

Sains merupakan penerokaan dan penemuan. Tiada cara yang lebih baik untuk menarik minat orang ramai terhadap sains, terutamanya generasi muda, selain dari aktiviti *hands-on* dan eksperimen secara langsung. Dengan ini, MESTECC telah melancarkan Minggu Sains Negara 2018 untuk kali pertama, dengan tema "Negaraku Berinovasi".

ASM telah bekerjasama dengan Kerajaan Negeri Johor dan 15 rakan strategik dalam menganjurkan Minggu Sains Negara Peringkat Negeri Johor di Sekolah Menengah Kebangsaan Agama Segamat. Bertemakan "Luaskan Inovasimu", pelawat dan pelajar telah menerokai keseronokan aktiviti berasaskan sains yang berinteraktif.

1,550 pelajar sekolah menengah sekitar Segamat telah menyertai kuiz dan menghantar projek ciptaan semasa *CCM STEM Up Challenge.*

32 pelajar sekolah menengah telah menampilkan cara penyelesaian yang kreatif untuk masalah harian melalui *Innovation Competition.*

85 pelajar sekolah menengah menyertai *I-STEM Challenge.*

50 guru yang yang telah dilatih untuk meningkatkan mutu pembelajaran pelajar dalam mata pelajaran STEM melalui IBSE & *STEMazing Workshop.*

YSN-ASM telah menganjurkan program *Science Café* dan Sembang Sains untuk berinteraksi dengan para hadirin tentang topik-topik sains.

4,000 anggaran jumlah pelawat yang telah hadir ke acara yang berlangsung selama tiga hari tersebut.

Minggu Sains Negara // 2-7 April 2018 // seluruh Malaysia

- Lawati galeri foto.
- Baca liputan ASM.

MEMELIHARA ALAM SEKITAR UNTUK PEMBANGUNAN LESTARI

Alam sekitar merupakan komoditi penting yang membawa kebaikan kepada semua elemen dalam ekosistem. Oleh itu, alam sekitar perlu dilindungi agar sentiasa terpelihara. Pada masa yang sama, masyarakat perlu dididik tentang kepentingan alam sekitar serta menjana kewangan untuk penduduk setempat.

Sehubungan itu, *geopark* dibangunkan sebagai konsep perlindungan, pendidikan dan pembangunan lestari yang holistik. Kawasan simpanan ini mempraktikkan pendekatan bawah-ke-atas untuk menggabungkan pemuliharaan dengan pembangunan lestari yang melibatkan komuniti tempatan.

Malaysian Technical Cooperation Programme (MTCP) *Global Geopark Planning and Development Workshop* telah diadakan untuk mendidik peserta tentang asas-asas perancangan dan pembangunan *geopark*.

Seramai 16 orang peserta dari dalam dan luar negara telah menghadiri sesi kuliah, bengkel dan lawatan padang ke beberapa *geosite* sekitar Langkawi dan *Jerai Geopark*. Penceramah dan pengajar telah berkongsi pengetahuan dan teknik pengurusan geopark untuk membantu peserta membangunkan geopark di negara masing-masing.

MTCP Global Geopark Planning and Development Workshop // 16-20 September 2018

- Lawati galeri foto.
- Baca liputan ASM.
- Layari laman sesawang.

MENGGALAKKAN BUDAYA *SAFE AND SECURE SCIENCE*

Para saintis dan penyelidik dari rantau MESA berkumpul di *Conference to Promote Safe and Secure Science in the Middle East/North Africa and South/ Southeast Asia* untuk berbincang dan berkongsi amalan terbaik dalam mempromosikan kesedaran tentang amalan sains yang selamat dan terjamin di rantau ini. Menekankan topik sains hayat yang relevan dengan rantau MESA, para peserta membincangkan isu utama seperti penyelidikan, dasar sains, etika, tanggungjawab dalam sains, integriti penyelidikan, dan penglibatan orang ramai.

Modul Pendidikan *Responsible Conduct of Research* (RCR) juga telah dilancarkan bersempena dengan persidangan ini.

93 Peserta dari 13 negara

6 Penceramah jemputan dari Algeria, Malaysia, dan Indonesia

6 Peserta dari Malaysia memenangi *Best Poster Award*

Conference on Safe and Secure Science // 5-9 Februari 2018 // Sunway University

- Lawati galeri foto
- Baca liputan media.
- Baca liputan ASM.

ANUGERAH DAN GERAN

Anugerah dan geran adalah galakan utama kecemerlangan dalam kalangan masyarakat saintifik yang menandakan sumbangan dan pencapaian mereka. Pengiktirafan sebegini adalah penting untuk para saintis dan penyelidik yang telah menjalankan penyelidikan saintifik yang signifikan bagi menangani isu tempatan dan global, selain dari memposisikan Malaysia secara strategik di mata dunia.

ASM memanfaatkan kepakaran Felo sebagai ahli panel penilaian dan pemantauan untuk pelbagai anugerah dan geran. Dengan kepakaran dalam bidang masing-masing, Felo-felo ini memilih saintis dan ahli teknologi yang mempamerkan kecemerlangan dalam usaha penyelidikan mereka.

BOLEHKAH KANSER **DILENYAPKAN** SELAMANYA?

Kanser: Perkataan yang menimbulkan perasaan mendalam – kebiasaannya 'ketakutan'.

Malaysia mempunyai ramai penyelidik dalam bidang penyelidikan kanser yang berusaha memahami, memperbaiki sistem pengesanan dan mencari kaedah baharu untuk menyembuhkan penyakit tersebut. Untuk memastikan usaha murni komuniti penyelidik ini berterusan, peluang dan dana perlu disediakan sebaiknya.

Setiap tahun, Felo ASM menyumbangkan pengalaman dan pengetahuan mereka kepada MAKNA untuk menganugerahkan geran kepada penyelidik muda negara dalam bidang penyelidikan kanser. Penyelidik yang menunjukkan pencapaian cemerlang dalam bidang ini dianugerahkan insentif untuk meneruskan penyelidikan mereka.

Penerima Anugerah Tahun 2018

1) Dr Tee Yee Kai, Universiti Tunku Abdul Rahman (UTAR)
Novel Chemical Exchange Saturation Transfer Magnetic Resonance Imaging (CEST MRI) for Brain Cancer Diagnosis and Treatment Monitoring

2) Dr Amirah Abdul Rahman, Universiti Teknologi MARA (UiTM)
Identification of the role of equilibrative nucleoside transporter 2 (ENT2) in modulating colorectal cancer cell death by RNA interference

3) Vimalan Rengganaten, UTAR
Elucidation of candidate circular RNAs as predictive molecular markers of chemoresistance in colorectal cancer and colorectal cancer stem cells

• Lawati galeri foto. • Baca liputan ASM.

MENERUSKAN LEGASI **DR RANJEET BHAGWAN SINGH**

Penemuan santifik yang hebat mungkin bermula daripada penyelidikan yang terkecil. Mendiang Dr Ranjeet Bhagwan Singh menyedari kepentingan menyokong penyelidik awal kerjaya dalam bidang penyelidikan mereka. Oleh itu, beliau telah menyumbangkan sebahagian harta beliau untuk menyediakan geran sebagai dana tambahan bagi menyokong penyelidikan saintis-saintis ini.

Penerima Geran Tahun 2017
Dr Sharmili Vidyadaran, UPM
Mesenchymal stem cells ameliorate microglia-driven neuronal damage

GERAN KHAS UNTUK **PENYELIDIKAN SAINTIFIK STRATEGIK**

Program Utama DSTIN
Projek *Moving up the Value Chain and Environmentally Friendly Processes in Silicon Photovoltaic Technology: Non-toxic Processes, Wafering and Crystal Growth* telah diterima sebagai program yang bakal memberi impak pada pembangunan STI serta seiring dengan Program Transformasi Kerajaan (GTP) dan Program Transformasi Ekonomi (ETP).

Projek ini telah menyumbang kepada perkembangan teknologi tempatan dalam pengeluaran sel solar dan *wafer* yang turut membawa manfaat kepada ekonomi negara.

Profesor Dato' Dr Kamaruzzaman Sopian FASc telah dianugerahkan geran ini pada tahun 2014 dan projek tersebut telah disiapkan pada bulan Mei 2018.

Peruntukan Khas Agensi MESTECC
Projek *Development of Yeast System for Flavonoid Production* dikenal pasti sebagai sebuah projek yang memberi impak kepada pembangunan STI negara seiring dengan Model Ekonomi Baharu (NEM).

Projek ini telah memajukan teknologi dalam penghasilan flavonoid tumbuhan daripada sistem yis.

Emeritus Profesor Dr Normah Mohd Noor FASc telah menerima anugerah ini pada tahun 2014 dan projek ini telah disiapkan pada Februari 2018.

ANUGERAH **SAINTIS MUDA NEGARA 2018**

Anugerah ini diberikan oleh MESTECC kepada saintis muda Malaysia yang cemerlang dalam penyelidikan dan pembangunan saintifik.

Penerima Anugerah Tahun 2018
Dr Oon Chern Ein , USM
A novel sirtuin inhibitor: Co-targeting cancer cells and the tumour vasculature as a therapeutic strategy in cancer

ANUGERAH **JURUTEKNOLOGI NEGARA 2018**

Anugerah ini diberikan oleh MESTECC kepada juruteknologi dan golongan semi-profesional seperti juruteknik dan pembantu makmal yang telah memberi sumbangan dan memperoleh pencapaian dalam bidang S&T.

Penerima Anugerah Tahun 2018
Wan Saridah Wan Omar, Malaysian Palm Oil Board (MPOB)
Peningkatan nilai sawit melalui pembangunan produk hiliran

PENYAMPAIAN PROJEK BERKUALITI

Pasukan Pemantauan Projek (PMT) memastikan projek dilaksanakan mengikut garis masa yang ditetapkan serta sumber-sumber diuruskan dengan bijak. Felo ASM mempraktikkan pengetahuan dan pengalaman mereka dalam membimbing projek supaya ia disiapkan dengan sempurna.

ASM telah dilantik untuk memantau beberapa projek P&P sejak tahun 2007. Pada tahun 2018, sebanyak 17 projek telah disiapkan.

Projek penyelidikan yang dipantau ASM sejak tahun 2007-2018:

10	***TechnoFund***
3	***Community Innovation Fund***
4	***Flagship***
17	**Jumlah projek**

NEWTON-UNGKU OMAR FUND (NUOF)

Kerjasama antara Kerajaan Malaysia dan UK diteruskan lagi tahun ini dengan NUOF. Dana tersebut bertujuan untuk membangunkan rangkaian antara penyelidik multi-disiplin dan inter-disiplin melalui integrasi pengetahuan STI yang mengenal pasti isu-isu sosio-ekonomi Malaysia.

Aktiviti yang dijalankan di bawah dana tersebut termasuk:
a) Meningkatkan kapasiti dalam komuniti sains dan inovasi Malaysia melalui biasiswa, skim mobiliti dan pusat kerjasama
b) Membentuk kerjasama penyelidikan dalam topik pembangunan
c) Mewujudkan rakan kongsi inovasi dan dana cabaran untuk membentuk penyelesaian berinovasi dalam topik pembangunan

ASM sebagai salah satu badan pelaksana NUOF telah menjalankan beberapa program dengan kerjasama badan pelaksana dari UK yang lain.

Newton Advanced Fellowships
Menyediakan geran untuk latihan, kerjasama, dan lawatan kerja dua hala untuk membangunkan kebolehan dan keupayaan kumpukan penyelidik.

Newton Mobility Grants
Menyediakan geran untuk lawatan, perbelanjaan sara diri dan penyelidikan, dan lawatan untuk mengukuhkan keupayaan penyelidikan dan inovasi penyelidik tempatan.

2018 Mobility Grant in Natural Sciences
• Dua orang penerima anugerah
• Jumlah geran yang diberi: £24,000

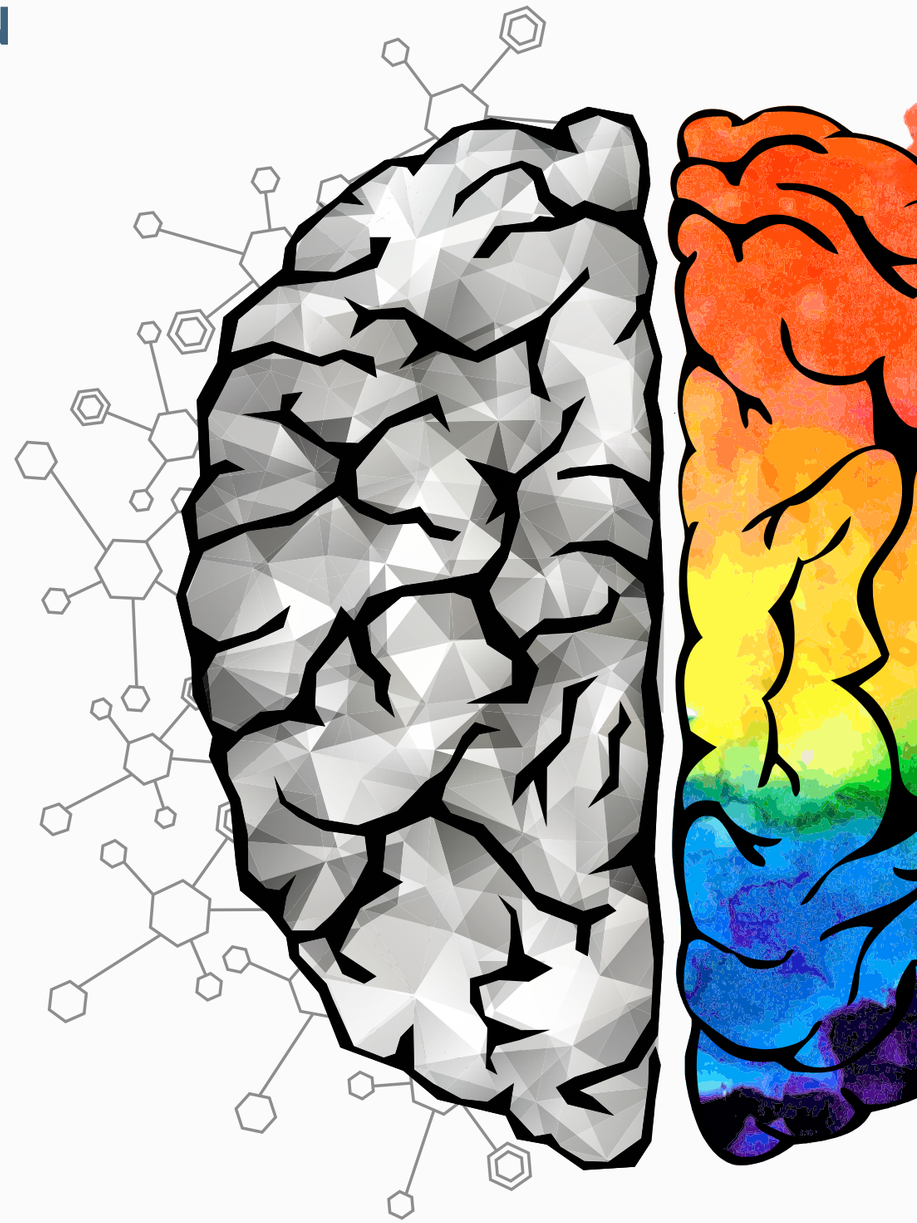
2018 Mobility Grant in Social Sciences and Humanities
• Seorang penerima baru
• Jumlah geran yang diberi: £12,000

UK-Malaysia Bilateral Health Research Collaboration Programme in Non-communicable Diseases (NCDs)
Kolaborasi dua hala antara penyelidik Malaysia dan UK dalam bidang Sains Kesihatan dan Perubatan untuk menyelesaikan masalah kesihatan yang kian meruncing di Malaysia.

Newton Researcher Links
Mempergiat perhubungan dan keupayaan sokongan dalam kalangan penyelidik awal kerjaya.

Lima projek inovasi sosial berikut telah dijalankan melalui *Newton Researcher Links Workshop on Social Innovation through Team Entrepreneurial Learning:*

TITIK PERTEMUAN **DUA ALIRAN**



BOLEHKAH DATA DAN EKSPRESI BERSATU?

Bagi mereka yang tidak mengenali dunia seni atau sains, keduanya kelihatan sangat berbeza; satu didorong data, manakala satu lagi didorong emosi. Kebiasaannya, seni dilihat sebagai hasil ekspresi manakala sains pula merupakan penerokaan alam realiti untuk mencari kebenaran.

ASM *ArtScience Prize* adalah satu inisiatif untuk memberi penghargaan kepada hasil karya seni gunaan yang menggabungkan sains dan kesenian.

Sesi *Coffee Chat* yang menampilkan Pengerusi Badan Bertindak *ArtScience Prize*, Ar Hijjas Kasturi FASc telah diadakan untuk memperkenalkan inisiatif *ArtScience* serta menarik minat orang ramai untuk memberi sumbangan kepada inisiatif ini. Para hadirin turut berpeluang berkongsi pengalaman masing-masing dalam menganjurkan, menyumbang serta menghadiri program dan acara bertemakan sains dan kesenian. Di samping itu, mereka juga telah mencadangkan kaedah untuk menarik perhatian dan minat orang ramai dalam inisiatif tersebut.

Sesi Coffee Chat bersama Ar Hijjas Kasturi FASc // 13 Oktober 2018

IMPAK GLOKALISASI

YSN-ASM telah membawa penambahbaikan secara giat melalui pelbagai inisiatif oleh ahli dan ahli gabungannya. YSN-ASM juga telah memberi impak yang tinggi di peringkat antarabangsa.

Impak dan pengaruh positif YSN-ASM terbukti melalui kejayaan melaksanakan lebih daripada 50 program jangkauan luar sains, pendidikan sains, komunikasi sains, kepimpinan sains, dasar sains, integriti sains, dan rangkaian antarabangsa.

***Malaysian Educational Module on Responsible Conduct of Research* (RCR)**

Memupuk budaya integriti penyelidikan dalam ekosistem saintifik Malaysia

***7th ASEAN Plus Three Junior Science Odyssey* (APT JSO)**

Merekabentuk dan membangunkan isi kandungan dan meneraju pelaksanaan program tersebut

National Science Challenge

Bilangan ahli yang teramai menyumbangkan ilmu dan tenaga dalam penyediaan soalan dan modul

Minggu Sains Negara & *2018 Kuala Lumpur Engineering & Science Fair* (KLESF)

Pameran STEM dan *Science Talks*

KOLOKIUM YSN-ASM 2018

Bertemakan *"Glocalise the Impact"*, Kolokium YSN-ASM 2018 menghimpunkan 86 ahli dan ahli gabungan dan telah diadakan di Bukit Tinggi, Pahang dari 7 hingga 9 Disember 2018. Acara tahunan dianjurkan untuk meraikan pencapaian profesional dan peribadi serta impak kolektif YSN-ASM. Di samping itu, ia juga diadakan untuk merangka program dan aktiviti YSN-ASM bagi tahun 2019.

Kolokium tahun ini menyaksikan Dr Chai Lay Ching menyandang jawatan sebagai pengerusi baru YSN-ASM yang diambil alih dari Profesor Dr Abhi Veerakumarasivam, dan menjadi wanita pertama yang mempengerusikan YSN-ASM. Usaha yang lebih fokus dan bersepadu pada program perdana akan dilaksanakan untuk memaksimumkan impak yang bertujuan untuk mempelopori pemimpin untuk melaksanakan pelbagai aktiviti atau inisiatif oleh YSN-ASM.

2018 : 10 AHLI BARU YSN-ASM TELAH DILANTIK

40 AHLI GABUNGAN BARU TELAH DIPILIH

KONSORTIUM SAINS KEBANGSAAN

Dalam usaha memperkukuh P&P Malaysia untuk mentransformasikan sosio-ekonomi negara, Konsortium Sains Kebangsaan telah diwujudkan sejak 2013 untuk memperkasakan usaha bersepadu negara dalam bidang strategik STI. Inisiatif ini telah dijalankan melalui penubuhan pusat tumpuan untuk kerjasama antara institusi dan antarabangsa.

Misi penubuhan konsortium ini adalah untuk mengantarabangsakan P&P Malaysia dan pada masa yang sama meningkatkan output penyelidikan berimpak tinggi. ASM juga ingin mencari rakan kerjasama tempatan dan antarabangsa untuk meneraju bidang strategik STI bagi membangunkan saintis cemerlang. Selain itu, program ini bertujuan untuk memudahkan Pusat Kecemerlangan (COE) luar negara yang sedang mencari pusat kerjasama tempatan agar ASM berpeluang untuk mengambil bahagian dalam projek saintifik berskala global.

MALAYSIA INSTITUTE FOR INNOVATIVE NANOTECHNOLOGY (NanoMITe)

Sebagai konsortium penyelidikan global yang terdiri daripada 100 saintis nano peringkat tertinggi dari institusi dan pusat akademik bertaraf dunia, Malaysia Institute for Innovative Technology (NanoMITe) berusaha untuk:

- Menyediakan platform global untuk penyelidikan, membangunkan dan mengukuhkan keupayaan dan kapasiti tempatan terhadap nanoteknologi
- Memacu industri berasaskan nanoteknologi untuk pertumbuhan ekonomi dan kesejahteraan masyarakat
- Menyokong pelaksanaan Kerajaan ke atas Ekonomi Distributif dengan memberi tumpuan kepada penyertaan aktif para saintis nano kelas dunia tempatan dan global
- Menggalakkan sains, budaya penyelidikan dan ekonomi berasaskan pengetahuan

NanoMITe sedang menjalankan 19 projek dalam lima bidang utama:

- Tenaga
- Kesihatan, Perubatan dan Penjagaan Kesihatan
- Makanan dan Pertanian
- Elektronik, Peranti dan Sistem
- Alam Sekitar

Pada tahun 2018, NanoMITe telah mengambil bahagian dalam *Educational Research Cluster under the Indonesia-Malaysia Research Consortium* (IMRC) bersama beberapa universiti di Indonesia. Di samping itu, Pasukan Penyelidikan Elektronik, Peranti dan Sistem telah melawat *Harvard University* dan *Massachusetts Institute of Technology* (MIT) dari 10 Julai - 8 Ogos 2018 untuk tujuan kolaborasi.

PUSAT FIZIK ZARAH NEGARA (NCPP)

Pusat Fizik Zarah Negara (NCPP) menerajui penyelidikan fizik zarah eksperimental melalui kerjasama dengan pusat penyelidikan fizik teoretikal terkemuka dan pusat kecemerlangan dalam bidang fizik zarah dan tenaga tinggi. NCPP berkolaborasi dengan empat buah pusat kecemerlangan terkemuka:

- *Compact Muon Solenoid* (CMS), *European Organization for Nuclear Research* (CERN), Geneva, Switzerland
- *Deutsches Elektronen Synchrotron* (DESY), *Hamburg*, Germany
- *High Energy Accelerator Research Organization* (KEK), Tsukuba, Jepun
- *Osaka University*, Osaka, Jepun

PENYELIDIKAN HUTAN HUJAN TROPIKA LEMBAH IMBAK

Yayasan Sabah telah membangunkan Imbak *Canyon Studies Centre* (ICSC), sebuah fasiliti di zon teras di Kawasan Pemuliharaan Imbak Canyon (ICCA) di Tongod, Sabah. ICSC menyediakan fasiliti penyelidikan bertaraf antarabangsa untuk para penyelidik menjalankan kajian berkaitan ekosistem hutan hujan tropika dan biodiversiti merangkumi taksonomi hutan hingga ke perubahan iklim.

Pada tahun 2018, ASM telah menganjurkan bengkel *Imbak Canyon: Producing Internationally Acclaimed Leaders in Tropical Rainforest Research* untuk memperkenalkan dan menggalakkan komuniti saintifik Malaysia untuk mengambil peluang menjalankan penyelidikan di ICSC.

Imbak Canyon: Producing Internationally Acclaimed Leaders in Tropical Rainforest Research // 4 April 2018

• Lawati galeri foto. • Baca liputan ASM.

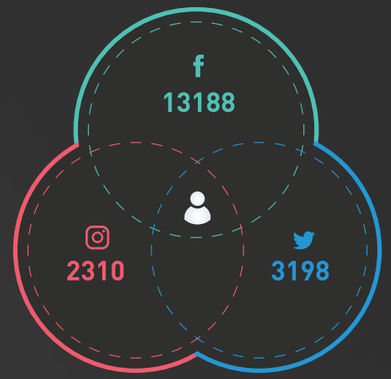
LIHAT. DENGAR. ALAMI.

ASM percaya dengan penyampaian maklumat melalui komunikasi ringkas. Di ASM, persoalan **"kenapa ia penting?"** akan dijawab melalui teknik visual dan penulisan yang kreatif untuk berkongsi kepuasan penemuan dengan semua. Setiap sukaan dan ulang kicau adalah hasil minat masyarakat, dan kami menghargai setiap interaksi tersebut. Penyampaian usaha saintifik dalam bahasa yang mudah difahami merupakan usaha yang berterusan bagi ASM. Kami akan sentiasa berkongsi pencapaian kami di alam maya dengan anda.

KAMI MENGALU-ALUKAN KERJASAMA DENGAN ANDA !

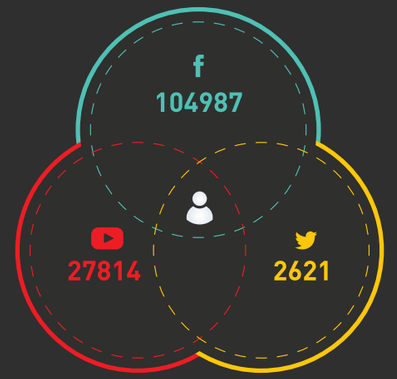
Emelkan kepada:
science_comm@akademisains.gov.my

Komuniti Media Sosial



JUMLAH: 18,835

Tontonan Video



JUMLAH: 135,422

Meningkatkan Pemahaman Melalui Estetika

Setiap kajian mempunyai nilai signifikan yang tersendiri; tiada kajian yang lebih tinggi nilainya berbanding yang lain. ASM berhasrat meningkatkan kesedaran tentang pencapaian Malaysia dalam bidang STI melalui penerbitan. Penerbitan kami juga boleh digunapakai oleh para penggubal dasar untuk membuat keputusan yang bijak. Hasil penerbitan ASM dibuka kepada semua lapisan masyarakat, dengan harapan agar rakyat Malaysia akan menjadi lebih celik sains.

Jumlah penerbitan:

Laporan Nasihat 4

Kertas Posisi 2

Buku Saintifik 2

Laporan Persidangan 1

Artikel *ASM Science Journal* 17

Laporan Tahunan 1

Pembaca dalam talian (ISSUU):

Pembaca
30,587

Capaian
339,478

MENGHUBUNG SAINS SECARA GLOBAL

MENEMPUH CABARAN GLOBAL UNTUK MASA DEPAN YANG CERAH

Pembelajaran merupakan suatu proses sepanjang hayat. Saintis masa kini aktif mencari jalan untuk mencapai SDG secara pembelajaran bersama *(co-learn)* dan mencipta bersama *(co-create)* menjelang tahun 2030. Antara isu global yang sering dibangkitkan pada tahun 2018 adalah kesihatan, pendidikan, kesamaan jantina, produktiviti, inovasi, perubahan iklim, sumber air dan teknologi memuncul. ASM telah menghadiri 34 mesyuarat dan persidangan antarabangsa yang berkaitan isu-isu tersebut, malah menyumbangkan input dalam bentuk pengisytiharan rasmi, resolusi dan membentuk platform serantau agar semua pihak berkepentingan dapat bekerjasama.

Isu Air Tanggungjawab Semua

Pada tahun 2015, *World Health Organisation* (WHO) menyatakan bahawa seramai 1.8 juta penduduk dunia masih mendapatkan bekalan air daripada sumber yang tercemar. Justeru, seramai 250,000 kanak-kanak di bawah umur lima tahun mendapat penyakit cirit birit lalu meninggal dunia. Untuk membendung masalah ini, *Association of Academies and Societies of Sciences in Asia* (AASSA) yang terdiri daripada 34 akademi serta persatuan saintifik dan teknologi dari Asia dan Australasia telah memilih topik penyakit bawaan air sebagai agenda utama untuk diatasi pada tahun 2018. Sehubungan itu, ASM telah menganjurkan *International Waterborne Infectious Diseases Conference* yang menampilkan barisan pakar dari pelbagai bidang berkaitan dengan air untuk berkongsi ilmu dan pengalaman dalam menangani masalah bekalan air.

Selain daripada persidangan di atas, ASM turut menyertai *8th World Water Forum* yang membincangkan sumber air mampan melalui pengurusan dan pengagihan bekalan air global dengan efektif. Dianggarkan bahawa tua daripada tiga orang akan menghuni kawasan yang dilanda masalah air menjelang tahun 2025. Masalah kekurangan bekalan air merupakan masalah serantau. Oleh itu, kerjasama antara semua pihak perlu wujud dalam mencari penyelesaian.

International Waterborne Infectious Diseases Conference // 15-16 Ogos 2018 // Kuala Lumpur, Malaysia

» • Lawati galeri foto. • Baca resolusi rasmi.
• Baca liputan ASM.

Melentur Pucuk Kepimpinan Masa Depan

Sebahagian besar komuniti rantau ASEAN terdiri daripada golongan belia. Dianggarkan bahawa 60% populasi rantau ASEAN berumur di bawah 35 tahun. Golongan belia adalah pemacu perubahan di rantau ini. Oleh itu, ekosistem dan platform yang sesuai perlu dibentuk untuk memanfaatkan potensi dan impak dalam STI untuk membentuk masa depan yang lebih baik.

Pemimpin muda ASEAN perlu terlibat secara aktif dalam program kolaborasi untuk mencipta sebuah ekosistem pembelajaran sepanjang hayat di rantau ASEAN. Melalui pendekatan ini, kita akan mampu berdaya saing dengan negara maju yang sentiasa selangkah di hadapan. Seterusnya, kita juga boleh menjadi pemimpin dan bukan sekadar pengikut.

Tahun ini, ASM telah mencadangkan *ASEAN Young Scientists Network* dan pembentukan *ASEAN Foresight Alliance*. Selain itu, ASM juga telah menganjurkan *ASEAN Young Leaders Forum* di Cebu, Filipina untuk membincangkan kepentingan membentuk masa hadapan yang mampan untuk rantau ASEAN menerusi *foresight*. Lebih dari 40 orang ketua ASEAN berhimpun di forum yang menyediakan mereka untuk menghadapi masa depan yang disruptif dan menggalakkan kepimpinan yang mampan untuk ASEAN yang progresif.

Bersempena dengan forum tersebut, *ASEAN Young Scientists Network* juga telah dilancarkan dengan harapan platform ini meningkatkan penglibatan pemimpin muda ASEAN dengan penggubal dasar dalam melakar masa depan rantau tersebut.

ASEAN Young Leaders Forum // 18 Oktober 2018

» • Tonton video pelancaran ASEAN YSN.
• Baca liputan ASM.

Semangat Kolaborasi

Tahun ini, ASM mengambil satu lagi langkah bagi mempertingkat konsep kolaborasi ke peringkat seterusnya dengan perkongsian data, maklumat, ilmu pengetahuan dan kepakaran dalam STI. ASM berhasrat untuk menyambungkan semua elemen tersebut pada peringkat serantau untuk menangani isu seperti kesihatan, perubahan iklim dan konflik bio-neksus di peringkat global dan serantau. Dalam dunia yang serba pantas, keperluan untuk sesebuah rangkaian dan perniagaan mengadaptasi perubahan ke arah transformasi adalah penting.

Tiada seseorang individu, organisasi mahupun negara yang mempunyai jawapan untuk persoalan ini. Oleh itu, budaya bekerjasama dengan visi yang dikongsi adalah sangat diperlukan. Oleh itu, ASM telah mencadangkan agar APEC mempelopori Open Science Initiative semasa *12th APEC Policy Partnership for STI Meeting*. Inisiatif ini bertujuan membentuk jaringan akademia, badan kerajaan, industri dan masyarakat di rantau Asia Pasifik. Objektif inisiatif adalah:

- Mempraktikkan teknologi digital untuk mencari penyelesaian inklusif dan lestari untul cabaran global dan serantau
- Menggalakkan penyelidikan bertanggungjawab
- Menghapuskan halangan bagi membolehkan aliran ilmu pengetahuan secara bebas melalui pemeliharaan, kebolehcapaian dan kebolehgunaan semula data

12th APEC Meeting on Policy Partnership for STI // 12-1 Ogos 2018 // Papua New Guinea

» • Lawati galeri foto • Baca liputan ASM

Suara Global Sains Sosial dan Semula Jadi

Tahun 2018 menandakan satu peristiwa penting bagi pejabat serantau ini dengan penggabungan *International Council for Science* (ICSU) dan *International Social Science Council* (ISSC) untuk membentuk *International Science Council* (ISC). Pelancaran secara rasmi itu berlansung ketika Perhimpunan Agung yang telah diadakan di Paris bagi memperingati peristiwa bersejarah tersebut. Visi utama ISC adalah untuk menjadi suara global bagi kedua-dua sains semula jadi dan sosial. Kini, program akan mula dirancang dengan mengambil kira input dari kedua bidang tersebut bagi mencapai SDG.

Regional Office for Asia and the Pacific (ROAP) akan meneruskan pengurangan risiko bencana dan kesihatan bandar sebagai bidang utama. ROAP turut mengekalkan kerjasama dengan IRDR ICoE-Taipei, dan menganjurkan tiga *Advanced Institutes* dalam bidang bencana iklim yang terjadi secara perlahan *(slow-onset)*, pengurangan risiko tanah runtuh, serta bahaya gempa bumi. Dana permulaan juga disediakan kepada ahli Advanced Institutes tersebut untuk memperkukuh penyelidik antara-disiplin serta memupuk semangat kerjasama antara negara serantau.

Dari segi kesihatan dan kesejahteraan bandar, *Science Planning Group on Epigenetics* di bawah ROAP telah menghasilkan Pelan Saintifik bertajuk *The Impact on Health and Well-Being as a Consequence of Rapid Urbanisation in the Asia-Pacific Region: The Role of Epigenetics.* Pelan sains tersebut bertujuan untuk membina kapasiti serantau dalam mengkaji kesan perubahan epigenetik yang disebabkan pembandaran pesat ke atas kesihatan manusia.

Untuk memberi impak yang lebih meluas di rantau ini, ROAP perlu bekerjasama dengan organisasi dan institusi serantau. Beberapa peluang sinergi telah diteroka oleh ROAP melalui lawatan ke UNESCAP serta UNISDR di Bangkok. Selain itu, ROAP juga telah mengadakan mesyuarat semasa Persidangan DBAR di Tengchong, China.

ROAP bersama dengan IPCC dan *Asian Network on Climate Science and Technology* (ANCST) telah menganjurkan bengkel *Status of Climate Science and Technology in Asia.* Bengkel tersebut telah menjemput saintis dari serata Asia untuk berkongsi ilmu pengetahuan dan teknologi berkatitan perubahan iklim, pengurangan risiko bencana serta pernglibatan mereka dalam pembangunan lestari.

10 Tahun dan Seterusnya

International Science, Technology and Innovation Centre for South-South Cooperation under the Auspices of UNESCO (ISTIC) merupakan pusat kategori II di bawah UNESCO melaksanakan program-program yang dirancang bagi memenuhi objektif dan agendanya sebagai platform antarabangsa untuk kerjasama antara negara-negara selatan dalam bidang STI. Pada tahun 2018, ISTIC:

- Telah menjalankan **9** program pembangunan kapasiti
  - 357 peserta dari **47** negara
- Bekerjasama dengan **31** organisasi
- Tambahan dua rakan strategik melalui MoU *Forum of Small Medium Economics AFRICA ASEAN* (FORSEAA) dan *United Nations Office for South-South Cooperation* (UNOSSC)

Meraikan 10 tahun kecemerlangan dalam STI, ISTIC menganjurkan *International Conference on Climate Change Education* yang menghimpunkan 127 perwakilan pakar, penggubal dasar, pegawai kerajaan, dan ahli akademik dari 20 buah negara.

Persidangan dua hari itu dibahagikan kepada empat sesi, di mana para pakar membincangkan mekanisme yang berkesan bagi mengintegrasikan pendidikan perubahan iklim dalam kurikulum, mengenal pasti sumber pembelajaran dan amalan yang baik yang akan menambah baik pendidikan perubahan iklim, dan mendapatkan sokongan untuk melatih guru mengenai pendidikan perubahan iklim menerusi Pendidikan Sains Berasaskan Inkuiri (IBSE).

Menyedari tindakan yang diperlukan bagi menangani cabaran dalam pendidikan perubahan iklim, satu dokumen yang menggariskan cadangan dan pelan tindakan mengenai pentingnya pendidikan perubahan iklim telah dirumuskan.

Tiga cadangan utama yang diutarakan:

- Pendidikan perubahan iklim perlu diintegasikan di dalam kurikulum sekolah. IBSE yang menggalakkan pemikiran kritikal dan analitikal harus diguna pakai sebagai pendekatan pengajaran.
- Industri perlu terlibat dalam mempromosikan kesedaran dan menyediakan input untuk amalan terbaik.
- Acara susulan mengenai topik ini mesti dimulakan oleh ISTIC dengan kerjasama pihak pemegang taruh yang berkaitan, sesuai dengan peranannya sebagai platform antarabangsa untuk *south-south cooperation.*

International Conference on Climate Change Education // 7-8 Mei 2018

JARINGAN IDEA

PERHIMPUNAN
MINDA BERNAS

Dalam era pengetahuan dan maklumat, aksesori yang paling penting bagi seseorang adalah idea. Perbincangan di alam realiti masih kekal relevan walaupun penggunaan internet makin meluas. Perhimpunan pakar saintifik memudahkan perkongsian pengetahuan, pembelajaran, perhubungan, dan penciptaan kandungan. ASM mengekalkan rekod seperti tahun-tahun sebelumnya dalam menyediakan output saintifik yang berkualiti dan bermanfaat kepada semua.

SAINS KELESTARIAN:
DUNIA YANG KITA INGINKAN

Modenisasi telah membawa perkembangan teknologi dan ekonomi yang menaikkan taraf hidup masyarakat. Namun begitu, dalam mengejar perkembangan tersebut, alam semula jadi turut mengalami kemusnahan seperti penyusutan sumber alam, perubahan iklim dan kepupusan spesis. Untuk mengurangkan kesan negatif tersebut, kita perlu mengambil langkah proaktif untuk menjaga kelestarian alam semula jadi.

ASM sentiasa berusaha untuk memasukkan elemen sains kelestarian dalam proses penggubalan dasar bertumpukan kepada penyelesaian masalah tempatan, sekali gus menyesuaikan dasar tersebut kepada perspektif rantau dan global. ASM telah menjalankan beberapa kajian yang menyiasat isu-isu alam sekitar masa kini dan masa hadapan. Walau bagaimanapun, masa hadapan Bumi tetap berada dalam genggaman golongan belia. Dengan keadaan semasa, masa hadapan yang bagaimanakah yang bakal dialami oleh golongan belia?

Penganjuran Perhimpunan Agung ke-11 (11th GA) ini bertujuan menjemput pakar-pakar untuk menyampaikan pendapat mereka tentang peranan sains kelestarian dalam membentuk masa hadapan Malaysia, serta mengenal pasti cabaran dan halangan dalam membentuk masa hadapan yang ideal.

Perhimpunun tersebut dimulakan dengan pembentangan mengenai kepentingan keselamatan siber dalam dunia yang hiper-hubung *(hyper-connected)* dan hiper-global *(hyper-globalised)*, serta ketersediaan Malaysia dalam menangani cabaran dan halangan yang mendatang.

Seterusnya, barisan pakar yang terdiri daripada Felo ASM telah membincangkan isu berkaitan sains kelestarian secara holistik dari pelbagai sudut pandangan.

Perhimpunan Agung ke-11 // 28 April 2018

Para hadirin mengambil bahagian dalam memberikan input tentang topik yang dibentangkan. Menerusi laman sesawang Menti, mereka memberi pandangan dan maklum balas tentang kelestarian, peranan saintis dalam kelestarian, serta masyarakat lestari yang ideal.

• Lawati galeri foto. • Tonton video soroton. • Baca liputan ASM.

ASM ideaXchange

together we make a difference

Bagi komuniti saintifik, perbincangan idea dan penyebaran ilmu pengetahuan merupakan satu tradisi. ASM juga tidak terkecuali dalam mengamalkan tradisi ini. Dianjurkan buat julung kalinya pada tahun 2011, sesi IdeaXchange ASM adalah sebuah platform untuk komuniti saintifik dan ahli-ahli ASM bertukar-tukar idea, membincangkan hal-hal merentasi bidang, dan membahaskan isu-isu topikal yang berkaitan dengan STI.

IDEAXCHANGE KE-28: PELAN INDUK STI

Kajian dan tanggapan umum yang telah diperoleh melalui lima Bengkel Strategik Perundingan Pemegang Taruh Kajian Pelan Induk STI (2020-2030) telah dikongsikan di sesi IdeaXchange ini. Maklum balas dari para hadirin berkenaan objektif, rangka kerja, topik, teras, strategi, matlamat, dan pelan tindakan dikumpulkan. Maklum balas ini akan digunakan dalam usaha penambahbaikan STIMP.

8 Mac 2018

ASM telah dilantik oleh MOSTI untuk menjalankan kajian untuk menyediakan Pelan Induk Sains, Teknologi dan Inovasi (STIMP) 2020-2030, setelah diluluskan oleh Majlis Sains Negara pada bulan Disember 2016.

Lawati galeri foto.

IDEAXCHANGE KE-29: KAJIAN DSTIN

Dihadiri oleh Felo ASM, wakil-wakil dari insititusi pengajian tinggi, kerajaan dan industri, IdeaXchange ini merupakan sesi pembentangan hasil kajian NPSTI 2021-2030 bagi mengumpul maklum balas mengenai rangka kerja yang telah dicadangkan.

Maklum balas dan cadangan daripada para hadirin telah dikumpulkan bagi setiap teras strategik, strategi, tindakan dasar, penunjuk dan sasaran. Input yang sesuai akan disertakan dalam Laporan Kajian NPSTI 2021-2030.

1 Ogos 2018

Draf dasar rangka kerja ini mengekalkan enam teras strategik dari dasar terdahulu, dan mengutarakan 27 strategi yang boleh diguna pakai untuk membina kebolehan dan keupayaan STI di Malaysia, pada tahun 2020 dan seterusnya.

Lawati galeri foto.

IDEAXCHANGE KE-30: KOMODITI EKSPORT ALTERNATIF UNTUK MALAYSIA

Malaysia perlu mempelbagaikan komoditi pertanian serta aplikasinya untuk kekal berdaya saing dan memacu industri asas tani yang progresif. Ini seiring dengan kenyataan YAB Perdana Menteri Tun Dr Mahathir Mohamad untuk meningkatkan usaha penyelidikan dan pembangunan dalam komoditi pertanian. Oleh itu, ASM telah mengadakan sesi ideaXchange yang bertajuk "Komoditi Eksport Alternatif untuk Malaysia".

Sesi ideaXchange tersebut telah dimulakan dengan gambaran keseluruhan tentang industri perladangan dan komoditi di Malaysia, yang telah disampaikan oleh Encik Othman Asmaon dari Kementerian Industri Utama Malaysia. Pembentangan beliau memfokuskan kepada komoditi ladang yang sedia ada seperti kelapa sawit, getah, kayu balak, koko, lada hitam dan kenaf.

Selepas pembentangan beliau, Datuk Dr Abdul Rahim Nik FASc telah mengendalikan perbincangan tentang komoditi eksport alternatif untuk Malaysia.

8 Oktober 2018

Malaysia merupakan pengeksport terbesar sarung tangan getah di dunia, juga pengeksport minyak dan lemak kelapa sawit kedua terbesar di dunia.

Lawati galeri foto.

SYARAHAN FELO


19 Mac 2018

BERPATUTAN ≠ TERUK

Perumahan mampu milik sering dianggap berkualiti rendah, tidak mampan dengan kebolehsesuaian yang rendah. Konsep D3 telah diperkenalkan yang menggabungkan prinsip moden STI dengan rekabentuk praktikal rumah kampung.

Konsep D3 membolehkan rumah berkualiti tinggi dihasilkan dengan rekabentuk serta teknik pembinaan berinovasi, yang mempunyai nilai pada skala besar. Tambahan pula, D3 mengamalkan Sistem Binaan Berindustri (IBS) seiring dengan *National Construction Industry Roadmap* untuk meningkatkan kualiti pembinaan di samping mengurangkan kos dan tempoh pembinaan. D3 mampu membawa kebaikan kepada pemilik, pemaju serta industri pembinaan.

Ir Dr Zuhairi Abd Hamid FASc // Sains Kejuruteraan

ADAKAH SEMUA CACING PARASIT BERBAHAYA?

Sebenarnya, tidak semua cacing parasit yang menjangkiti tubuh badan kita berbahaya.

Walaupun kebanyakan cacing parasit membawa kemudaratan, namun segelintir daripadanya membawa kebaikan. Kajian mendapati bahawa cacing parasit turut bertindak melindungi perumahnya untuk terus hidup. Oleh itu, dapat disimpulkan bahawa terdapat sinergi antara kehadiran cacing parasit, peningkatan mikrobiota usus serta sistem imun yang baik. Hasil daripada kerjasama saintis dan organisasi, masalah kecacingan dalam beberapa komuniti telah berjaya dibendung, terutamanya dalam komuniti Orang Asli.

Profesor Dr Yvonne Lim Ai Lian FASc // Sains Perubatan dan Kesihatan


5 April 2018


2 Oktober 2018

KELAPA SAWIT : SATU ALTERNATIF

Minyak sayur yang boleh diperbaharui seperti minyak kelapa sawit berpotensi menjadi bahan mentah industri dengan pelbagai penggunaan, yang menyumbang kepada pengurangan pelepasan gas rumah hijau yang berkesan. Ia lebih mudah didapati berbanding dengan petrokimia, yang tidak mampan dengan stok yang semakin berkurangan. Walaupun bukan polimer, tindak balas kimia yang sesuai dengan minyak sawit boleh menghasilkan perantaraan dengan fungsi yang berbeza yang dapat berinteraksi dengan monomer lain, untuk membentuk bahan dengan sifat dan aplikasi yang menarik.

Dr Gan Seng Neon FASc // Sains Kimia

PEMIKIRAN NOBELIS

Cara pemikiran Nobelis perlu diinstitusikan untuk membina kapasiti dan memupuk penyelidik, saintis, jurutera serta ahli teknologi ke arah Malaysia 2030. Namun, apakah yang diperlukan untuk memupuk pemikiran nobelis?

Tiga soalan perlu diajukan pada diri untuk memupuk pemikiran nobelis: "Siapakah Kita", "Di Manakah Kita" dan "Apa yang Perlu Kita Lakukan". Menginstitusikan pemikiran nobelis dapat membawa kebaikan pada semua pihak, termasuk individu, institusi, perusahaan serta badan kerajaan.

Dr Zainal Ariffin Ahmad FASc // Sains Sosial dan Kemanusiaan


18 Oktober 2018


18 Oktober 2018

MENGURANGKAN KEMATIAN MATERNAL

Malaysia telah berjaya mengurangkan kadar kematian maternal kini, melalui beberapa usaha termasuk mengaudit kematian maternal melalui *Confidential Enquiry into Maternal Deaths* (CEMD).

CEMD menyimpan data kematian maternal secara aktif untuk meningkatkan mutu pelaporan. Kualiti dan kuantiti data juga ditingkatkan melalui kerjasama rapat dengan Jabatan Pendaftaran serta pengumpulan data tanpa nama dan tidak bersifat punitif. Dengan itu, CEMD mampu memberi impak yang besar pada dasar-dasar yang sedia ada, serta mampu membantu dalam penggubalan dasar baharu.

Profesor Dato Dr Ravindran Jegasothy FASc // Sains Perubatan dan Kesihatan

JARINGAN BERKELAJUAN TINGGI

5G mempunyai kadar kependaman yang rendah, ketersediaan yang tinggi, dan ciri-ciri keselamatan yang mantap membolehkan ia digunakan dalam perkhidmatan kritikal. Ciri-ciri seperti kos rendah dan penggunaan tenaga yang rendah boleh memberi kelebihan ke arah memperluaskan IoT.

Untuk memanfaatkan *5G, National Fiberisation and Connectivity Plan* (NFCP) telah dilancarkan untuk menambahbaik kualiti dan liputan jalur lebar, mengurangkan kos, membolehkan semua lapisan masyarakat untuk mengakses internet serta meluaskan jaringan fiber yang sedia ada.

Profesor Dr Tharek Abd Rahman FASc // Teknologi Maklumat dan Sains Komputer


15 November 2018


29 November 2018

HYPER-CONVERGENT ECONOMY

Ekonomi dunia semakin bersifat hiper-konvergen, yang bergantung pada sistem pintar dan algoritma yang menghasilkan maklumat, idea dan inovasi baharu berasaskan data dan pembelajaran mesin.

Tanah, buruh dan modal yang merupakan pemandu ekonomi utama suatu ketika dahulu kini beransur berubah kepada sistem terbenam, algoritma pintar dan sistem berautonomi yang membentuk jaringan ilmu pengetahuan. Ekosistem teknologi yang mantap dijana oleh pelaburan modal dan bakat, sepuluh teras kesediaan rangkaian serta keupayaan dinamik akan memberi impak sosio-ekonomi yang signifikan.

Profesor Dr Mahendhiran Sanggaran Nair FASc // Sains Sosial dan Kemanusiaan

• Lawati galeri foto. • Baca liputan ASM.

PENGIKTIRAFAN MINDA TERULUNG MALAYSIA

Majlis penganugerahan Felo ASM dan pengumuman penerima Anugerah TRSM merupakan acara penting bagi ASM setiap tahun. Tahun ini, ASM berbesar hati menerima kehadiran Perdana Menteri Malaysia, YAB Tun Dr Mahathir Mohamad selaku dif kehormat bagi merasmikan majlis tersebut.

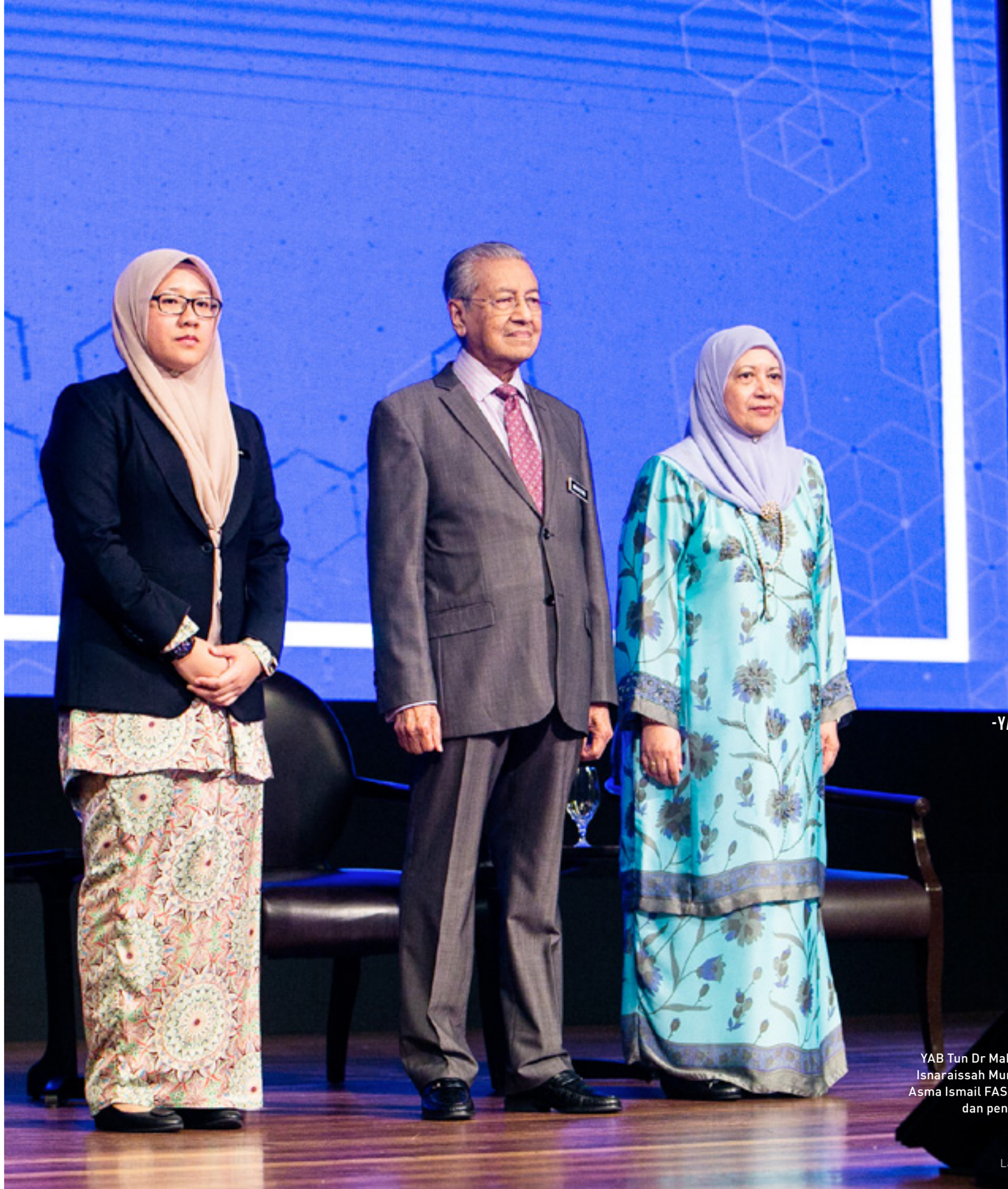
Tahun ini, seramai 24 orang penyelidik seluruh negara telah menerima penganugerahan TRSM 2018 dari YB Puan Isnaraissah Munirah Majilis, Timbalan Menteri MESTECC. Dilancarkan pada tahun 2010, jumlah penerima anugerah ini telah mencapai 157 orang.

Majlis Penganugerahan Felo tahun ini menganugerahkan 29 Felo baru, menjadikan jumlah Felo ASM seramai 352 orang. Penerima anugerah ini akan membawa gelaran "FASc" di hujung nama sebagai pengiktirafan dan penghargaan jasa serta pencapaian dalam bidang masing-masing.

Selain daripada itu, salah seorang Felo ASM yang telah menonjolkan ciri-ciri kepimpinan dan memberikan sumbangan individu yang cemerlang turut diberi pengiktirafan sebagai Felo Kanan. Tahun ini, YM Academician Datuk Dr Tengku Mohd Azzman Shariffadeen FASc telah dianugerahkan gelaran Felo Kanan bagi menghargai jasa dan usaha beliau dalam bidang ICT tempatan dan antarabangsa serta peranan beliau dalam penggubalan dasar negara.

Majlis Penganugerahan Felo Akademi Sains Malaysia 2018 dan Pengumuman Penerima Anugerah Top Research Scientists Malaysia 2018 // 1 November 2018

- Muat turun ASM Expert Network Edisi 2018.
- Lawati galeri foto/video.
- Baca liputan ASM.



STI MEMAINKAN PERANAN PENTING DALAM MEMACU PERTUMBUHAN EKONOMI DAN PEMBANGUNAN MASYARAKAT. EKONOMI NEGARA AKAN MERAIH MANFAAT DARI ENTITI YANG MENGGUNAPAKAI S&T. OLEH ITU, PERUSAHAAN TEMPATAN PERLU MENINGKATKAN USAHA UNTUK MEMASTIKAN PERTUMBUHAN EKONOMI NEGARA DINAMIK

-YAB TUN DR MAHATHIR MOHAMAD
PERDANA MENTERI MALAYSIA

YAB Tun Dr Mahathir Mohamad diiringi oleh YB Puan Isnaraissah Munirah Majilis dan Professsor Datuk Dr Asma Ismail FASc di Majlis penganugerahan Felo ASM dan pengumuman penerima anugerah TRSM.

DALAM KENANGAN

TAN SRI DATUK SERI LAW HIENG DING

17 NOVEMBER 1936 - 25 DISEMBER 2018

MEMAJUKAN AGENDA S&T NEGARA MELALUI PERKHIDMATAN AWAM

Tan Sri Datuk Seri Law Hieng Ding telah memperoleh Ijazah Sarjana Muda Perdagangan dalam Perakaunan dan Perbankan dari *Nanyang University* pada tahun 1960.

Dedikasi beliau dalam mempertingkat kualiti hidup penduduk setempat amat ketara melalui sumbangan beliau sebagai penjawat awam. Tan Sri Law telah menyertai *Sarawak United People's Party* (SUPP) dalam tahun 1960an dan telah dilantik sebagai anggota Majlis Daerah Bandar Sibu dari tahun 1964 hingga 1981. Seterusnya, beliau dilantik sebagai Pengerusi Majlis Daerah Bandar Sibu dari tahun 1978 hingga 1981.

Dari tahun 1976 hingga 1987, beliau menyandang jawatan sebagai Setiausaha Parlimen di bawah dua kementerian di Malaysia, iaitu, Kementerian Perumahan dan Kerajaan Tempatan pada tahun 1976, dan juga Kementerian Sains, Teknologi dan Alam Sekitar (MOSTE) dari tahun 1976 hingga 1987. Tan Sri Law dilantik sebagai Ahli Parlimen untuk Kawasan Sarikei pada tahun 1982, dan beliau telah memegang jawatan tersebut selama enam penggal. Seterusnya, beliau dilantik sebagai Timbalan Menteri Persekutuan MOSTE selama dua penggal dari 1987 hingga 1990. Setelah itu, beliau dilantik sebagai Menteri MOSTE dari tahun 1990 hingga 2004.

Tan Sri Law juga pernah memegang jawatan Timbalan Presiden SUPP dan Yayasan Pendidikan dan Penyelidikan Nantah, di samping menjadi pengerusi dan pengarah beberapa syarikat awam dan yayasan. Walaupun beliau telah meletakkan jawatan sebagai Ahli Parlimen pada tahun 2004, Tan Sri Law masih bergiat aktif untuk menaikkan taraf hidup penduduk negeri Sarawak.

Tan Sri Law telah menerbitkan beberapa buah buku, seperti *Environmental Governance in Malaysia: Insights and Reflections* yang diterbitkan pada tahun 2003 dan biografi beliau yang bertajuk *In Pursuit of Integrity and Justic*e pada tahun 2012.

Sumbangan dan jasa beliau kepada negeri Sarawak dan negara telah diiktiraf melalui anugerah dan gelaran yang diberikan kepada beliau oleh kerajaan negeri dan persekutuan. Kerajaan Persekutuan telah menganugerahkan beliau dengan Panglima Setia Mahkota Malaysia (PSM) pada tahun 2005, yang memberi beliau gelaran Tan Sri; Darjah Gemilang Pangkuan Negeri (DGPN) telah diberikan oleh Kerajaan Negeri Pulau Pinang pada tahun 2001 dengan gelaran Datuk Seri; serta Panglima Negara Bintang Sarawak (PNBS) daripada Kerajaan Negeri Sarawak pada tahun 1992 yang membawa gelaran Dato' Sri.

Beliau telah dilantik sebagai Felo Kehormat ASM pada tahun 2011 diatas sumbagan beliau dalam memajukan agenda S&T negara.

DR YAP THOO CHAI FASc

1 NOVEMBER 1940 - 24 OKTOBER 2018

PEMBIAK BAKA TUMBUHAN TERKEMUKA DAN PENDIDIK YANG BERDEDIKASI

Dr Yap Thoo Chai FASc telah memperoleh Ijazah Sarjana Muda dari *Department of Agronomy*, *National Taiwan University* sebelum meneruskan pengajian beliau pada peringkat Ijazah Sarjana dan Doktor Falsafah di *Department of Crop Science, University of Saskatchewan*.

Dr Yap berkongsi ilmu dan minat beliau terhadap alam tumbuh-tumbuhan sebagai pensyarah di Fakulti Pertanian, UM dari tahun 1971 - 1975. Beliau menjadi profesor dalam bidang pembiakan tumbuhan di UPM pada 1976. Selepas persaraan pada 1996, beliau menyumbangkan ilmu beliau dalam menyelidik dan mendidik di beberapa buah institusi pendidikan. Pada tahun 2008, beliau telah dilantik sebagai Felo ASM di bawah kumpulan disiplin Sains Biologi, Agrikultur dan Alam Sekitar.

Dr Yap telah berpeluang untuk mendalami minat beliau dalam pembiakan tumbuhan, genetik kuantitatif dan biometrik semasa bertugas sebagai pembantu penyelidik separuh masa di *Statistics and Experimental Design Laboratory, Department of Agronomy, National Taiwan University.* Selain itu, beliau juga pernah bertugas sebagai pembantu penyelidik di *Crop Science Department* di *University of Saskatchewan.* Seterusnya, beliau telah menjalankan penyelidikan sabatikal tentang *genotype x environment interaction di University of Western Australia* serta penyelidikan tentang pembiakan tumbuhan melalui simulasi komputer di *Institute of Genetics Mishima*, Jepun. Beliau telah menjalankan penyelidikan tentang pembiakan kelapa sawit di PORIM, lalu dilantik sebagai Penasihat Teknikal PORIM dari tahun 1982 hingga 1995.

Sepanjang hidup beliau, Dr Yap telah menghasilkan lebih daripada 100 kertas saintifik dalam jurnal tempatan dan antarabangsa. Buku beliau yang bertajuk "Prinsip-prinsip Pembaikbiakan Tanaman" telah diterbitkan pada tahun 1985, diikuti dengan edisi kedua pada tahun 1990. Dr Yap turut mengeluarkan tiga jenis sayur-sayuran untuk penghasilan komersial, iaitu jagung manis Chinta, jagung manis *Super* Bakti dan kacang panjang baka Line 30. Dr Yap turut memberi sumbangan ilmu beliau sebagai perunding perniagaan untuk beberapa projek agrikultur milik syarikat swasta. Selain daripada sumbangan ilmu pengetahuan, Dr Yap turut menunjukkan bakat kepimpinan beliau semasa menjadi Presiden *Malaysian Scientific Association* (1992-1996) dan Presiden *Malaysian Senior Scientists Association* (2009-2011). Beliau juga telah berkhidmat sebagai Setiausaha Rantau dan Ahli Lembaga *Society for the Advancement of Breeding Research in Asia and Oceania* (SABRAO) dari tahun 1989 hingga 2000.

Keluarga, sahabat, rakan sekerja dan kenalan Dr Yap akan sentiasa mengenang jasa beliau.

PROFESOR EMERITUS DR CHIN HOONG-FONG FASc

FEBRUARI 1935 - 19 MAC 2018

MENEROKA ILMU BENIH TUMBUHAN: SATU USAHA SEPANJANG HAYAT

Profesor Emeritus Dr Chin Hoong-Fong FASc telah menyertai Persatuan Sains di *Methodist Boys School*. Ini telah mencambahkan benih minatnya dalam bidang pertanian. Beliau melanjutkan pelajaran di *University High School* di Melbourne, dan kemudian mengambil sains pertanian di *University of Melbourn*e, dan menerima Sarjana Muda Sains Pertanian pada tahun 1960.

Dr Chin bertugas di UPM dari 1960 hingga 2018, dan berkhidmat selama 23 tahun secara sukarela. Di samping bekerja, beliau memperoleh Ijazah Sarjana dan PhD dalam Sains Pertanian dari *University of Melbourne*. Beliau dilantik sebagai Profesor Madya pada tahun 1975, Profesor pada tahun 1981 dan Profesor Emeritus pada tahun 1996 oleh UPM. Sebagai pengiktirafan sumbangan beliau kepada *University of Melbourne* dan pertanian antarabangsa, Dr Chin dianugerahkan Ijazah Kehormat Doktor Sains Pertanian oleh *University of Melbourne* pada tahun 1994. Ia adalah detik kebanggaan dan kegembiraan untuk Dr Chin yang berjaya menggenggam empat ijazah dalam disiplin yang sama dari universiti yang sama, suatu perkara yang jarang berlaku.

Kepakaran Dr Chin terletak pada penemuan penyimpanan dan pemuliharaan spesies rekalsitran. Beliau menumpukan hidupnya untuk membangunkan pelbagai kaedah penyimpanan biji benih dan pengawetankrio sumber genetik tumbuhan. Beliau mengejar pengetahuan sepanjang hayatnya, dipandu oleh keyakinannya untuk mencari, berkongsi dan menyelamatkan. Beliau percaya bahawa mencari ilmu adalah usaha seumur hidup; perkongsian pengetahuan adalah sama dengan menabur benih supaya ia dapat tumbuh dan tersebar; dan dia berusaha menyelamatkan warisan sumber genetik tanaman melalui penyimpanan benih.

Dr Chin adalah seorang penulis yang prolifik. Beliau telah menulis dan menyunting 13 buku mengenai topik yang berkaitan dengan pemuliharaan benih, hortikultur dan pertanian. Sebagai tambahan kepada penulisan akademik, beliau juga mempamerkan cintanya terhadap alam semula jadi melalui usaha kreatif. Selain daripada berkebun dan fotografi, Dr Chin mempamerkan minatnya terhadap tumbuh-tumbuhan dan manusia melalui penulisan puisi.

Dr Chin memulakan inisiatif *National Seed Symposium* pada tahun 1976. Kemudian, *National Seed Association Malaysia* (NSAM) ditubuhkan pada tahun 2008. NSAM memainkan peranan yang sangat penting dalam pertanian Malaysia dengan memberikan input berkenaan bahan penanaman dan benih.

Bagi menghargai perkhidmatan dan sumbangan yang ditaburkan, beliau dianugerahkan pingat Johan Setia Mahkota (JSM) daripada Yang Dipertuan Agong pada tahun 1990. Dr Chin merupakan Felo Asas ASM dilantik pada tahun 1995 di bawah disiplin Sains Biologi, Pertanian dan Alam Sekitar. Beliau telah melibatkan diri dalam ASM *Biodiversity Committee* (2001-2002) dan Jawatankuasa Penerbitan ASM (2001-2002).

ACADEMICIAN DR CHIA SWEE PING FASc

12 NOVEMBER 1945 - 8 MAC 2018

PERMATA DALAM KOMUNITI FIZIK

Dr Chia Swee Ping FASc menerima Ijazah Sarjana Muda Sains (Kepujian) dari UM pada tahun 1967. Setelah itu, beliau memperoleh Ijazah Sarjana Sains pada tahun 1968, dan PhD pada tahun 1972, dari *University of Illinois*. Seterusnya, Dr Chia turut memperoleh PhD dari universiti yang sama. Dr Chia merupakan penerima biasiswa *Fulbright Hayes* pada tahun 1967.

Dr Chia telah menyumbangkan tenaga dan ilmu sebagai seorang pensyarah di UM dari tahun 1972 hingga 1980. Beliau diberikan gelaran Profesor Madya pada tahun 1980, dan gelaran Profesor pada tahun 1992. Setelah berkhidmat di UM, Dr Chia telah berkhidmat di *INTI International University College* sebagai Penasihat Akademik di cawangan Subang Jaya dari tahun 1987 hingga 1999. Selepas itu, beliau telah berpindah ke cawangan Nilai untuk berkhidmat sebagai Timbalan Presiden Hal Ehwal Akademik dari tahun 1999 hingga 2006.

Dr Chia juga pernah bertugas sebagai Pengarah Penyelidikan (Sains & Teknikal) di *Huazi Resource and Research Centre* di Kuala Lumpur dari tahun 1987 hingga 2000. Beliau pernah meluangkan masa di luar negara selama beberapa tahun dalam usaha memantapkan ilmu pengetahuan beliau. Beliau merupakan saintis pelawat *International Centre for Particle Theory* di *University of Texas*. Selain itu, beliau juga merupakan pakar dan saintis pelawat di *Institute of Physics, Academia Sinica Taiwan* sebanyak dua kali pada tahun 1983 dan 1995. Beliau juga merupakan saintis pelawat di *University of Paris* pada tahun 1996.

Dr Chia menyumbangkan ilmu kepakaran beliau semasa berkhidmat sebagai Penolong Penyunting di *Malaysian Journal of Science* dari tahun 1977 hingga 1985. Beliau merupakan penyunting di Jurnal Fizik Malaysia sejak tahun 1984. Dari tahun 1991 hingga 1994, beliau merupakan Pengerusi *Association of Southeast Asian Nations at the Institute of Physics*, seterusnya menjadi Timbalan Presiden organisasi tersebut bermula tahun 1995. Dari tahun 1978 hingga 1982, Dr Chia berkhidmat sebagai Bendahari di *Southeast Asia Theoretical Physics Association.* Beliau juga merupakan ahli majlis *Association of Asia-Pacific Physical Societies* sejak tahun 2000, serta menyandang jawatan sebagai bendahari kehormat sejak tahun 2005.

Dr Chia merupakan ahli *Asian Committe Future Accelerator* pada tahun 1975. Beliau juga merupakan Felo di beberapa buah organisasi: *Malaysian Institute of Physics, Institute Physics United Kingdom, Association of Southeast Asian Nations Institute of Physics, International Centre of Theoretical Physics Southeast Asia* dan *Theoretical Physics Association* pada tahun 1997 beliau dilantik sebagai Felo ASM dibawah disiplin Matematik, Fizik, dan Sains Bumi. Sumbangan beliau diiktiraf dan pada tahun 2013, beliau telah dilantik sebagai Felo Kanan ASM.

Pada masa lapang, Dr Chia meluangkan masa dengan aktiviti yang memastikan minda beliau sentiasa cerdas seperti permainan bridge, catur, catur Cina dan mengamalkan Tai-ji untuk memastikan kesihatan tubuh badan.

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- ArtScience
- Frontier of Science
- Sustainable Development

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AKADEMI SAINS MALAYSIA

2018
ANNUAL REPORT

Scan to read the digital version of this report.

Cover Design Concept

Evidence-based informed decision making is our utmost priority as a Thought Leader in matters pertaining to Science, Technology and Innovation. The cover depicts the Academy as an organisation with unique deliverables yet working together with various entities for a harmonious, prosperous and sustainable Malaysia. Our desire of a Progressive Malaysia begins with giving the best ideas for the benefit of the society at large.

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Written and designed by the Academy of Sciences Malaysia

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THE ACADEMY OF SCIENCES MALAYSIA

THINK SCIENCE,
CELEBRATE TECHNOLOGY,
INSPIRE INNOVATION

ASM strives to be the nation's Thought Leader for matters related to science, engineering, technology and innovation.

ASM is committed to pursue excellence in the fields of Science, Engineering and Technology (SET) for the benefit of all.

Mission

- To be a Thought Leader
- To be an apex Advisory Body on Science, Technology and Innovation (STI) matters
- To be an effective promoter of public understanding and awareness of STI
- To make STI a basis for economic development and societal well-being

Functions

- Providing advice to the Government on matters related to STI of national and international importance
- Fostering a culture of excellence in SET in Malaysia
- Assisting in upgrading technological capabilities of Malaysian industrial sectors
- Promoting public awareness in understanding of science
- Enhancing international networking and collaborations
- Scientific publications

Strategies

- Harnessing scientific minds to charter STI direction for the country
- Fostering culture of excellence in SET
- Ensuring independent, authoritative and timely STI input
- Promoting the utilisation and application of science for societal well-being
- Facilitating the implementation of innovation-led economy strategy

Our Work

STI Strategic Studies
- Malaysia 2050
- Socio-Economics
- Emerging Technology
- Sustainability Science

STI Strategic Programmes
- Capacity Building
- Gateway
- Science Consortiums
- Consultative Fora

Stakeholders

Internal
- Fellows
- Associates
- Members of Young Scientists Network (YSN-ASM)
- Top Research Scientists Malaysia (TRSM)
- ASM Management

External
- Prime Minister's Department and Central Agencies
- MESTECC and its agencies
- Other Ministries and relevant agencies
- Industry
- Research institutions
- Higher Learning Institutions
- STI Professional Bodies
- International STI Organisations
- Urban and Rural communities

Client Charter

- Provide independent, evidence-based, reliable and timely advice
- Committed in initiating quality programmes towards developing strong STI foundation for the nation
- Represent Malaysia and its scientific community at the international arena
- Disseminate scientific knowledge

FROM THE PRESIDENT

PROFESSOR DATUK DR

Asra Jsrail

FASc

HOW WOULD YOU DESCRIBE 2018?

For ASM, 2018 as a whole was equally wonderful and hectic. We have been working determinedly to improve the practices and communication within the Academy's stakeholders, including the scientific experts, industry, media and broader public in delivering our objectives. As hectic as it can get, I am thankful to lead an organisation with the deep pool of experts that are willing to embrace transformation each and every day.

Around the world, governments engage various mechanisms to connect to scientific advice and knowledge. Malaysia is no exception. In fulfilling our role as a Thought Leader in Malaysia's STI arena, we continue to publish studies that are relevant and timely in nature. Led by ASM's Fellows, our studies aim to provide policy recommendations of national importance.

Apart from study, we also maintain a strong focus on SET-based programmes. ASM has always strives to nurture Malaysians towards developing scientific gifted talents for the future. As we continue to execute our strategic plan and programmes, we begin to see the results that we hope to see in our effort for STEM awareness in the country.

Our international team continues to foster strong ties with the international scientific community, allowing us to benefit from global expertise. From attending meeting to organising conference, we persistently position Malaysia as world class leader in science through active participation as a knowledge partner. Our involvement has enabled us to position ourselves as one of the leading science academy in the ASEAN region.

Expanding our Expert Network

This year, we have elected 29 leading individual among leading scientists, engineers and techonlogists as new Fellows and recognised 24 research scientists as TRSM. With more than 581 brilliant minds in our network, we are a force to be reckoned with. I thank the Fellows for their enthusiasm and contribution to growing and improving everything we do and for remaining focused on improving STI in and for Malaysia.

Beyond Thank You

The Academy only succeeds in all these areas through the support from MESTECC, and I am deeply grateful to all stakeholders, Fellows, and Associates who have partnered with us in so many ways. While we know there is more work to be done, we are proud of what we have accomplished thus far. In the upcoming years, we will continue to deliver innovative programmes and impactful studies for the betterment of Malaysia.

Each year, our Annual Report is a chance to highlight the spectacular efforts we all made together toward our objective as nation's Think Tank. I encourage you to explore our annual report to gain a broad understanding of our mission and vision. You will notice that this year's annual report is a little bit different.

Enjoy reading.

“WE WILL CONTINUE TO DELIVER INNOVATIVE PROGRAMMES AND IMPACTFUL STUDIES FOR THE BETTERMENT OF MALAYSIA.”

2018 BY THE NUMBERS

EXPERT NETWORK

352 FASc

8 DISCIPLINE GROUPS

- Information Technology & Computer Sciences
- Biological, Agricultural & Environmental Sciences
- Engineering Sciences
- Science & Technology Development Industry
- Medical & Health Sciences
- Mathematics, Physics & Earth Sciences
- Chemical Sciences
- Social Sciences & Humanities

41 ASSOCIATES

157 TRSM RECIPIENTS

67 YSN-ASM MEMBERS

96 YSN-ASM AFFILIATES

STRATEGIC STUDIES RECOMMENDATIONS UPTAKE

SCIENCE OUTLOOK 2017

15 OUT OF **18** RECOMMENDATIONS UNDER **21** **INITIATIVES** BY MINISTRIES, AGENCIES, INDUSTRIES & ACADEMIA

INDUSTRY 4WRD
1 OUT OF 2
RECOMMENDATIONS

TRANSBOUNDARY HAZE
1 OUT OF 5
RECOMMENDATIONS

CYBER SECURITY
5 OUT OF 5
RECOMMENDATIONS

ACTIVITIES

267 DISCOURSES

82 STAKEHOLDER ENGAGEMENTS

23 KNOWLEDGE SHARING SESSIONS

10 FLAGSHIP PROGRAMMES

10 PUBLICATIONS

370,065 TOTAL READERSHIP

17 ASM SCIENCE JOURNAL
+2 Special Issue

MEDIA COVERAGE

157 ONLINE & PRINT NEWS

18,835 SOCIAL MEDIA COMMUNITY

12 ISSUES OF (NEWSLETTER) ASM FOCUS

UNLOCKING INSIGHTS, MEANINGFUL IMPACT

BETWEEN SPECIALISED KNOWLEDGE AND POLICY-MAKING

The challenging environment today cannot be wished away. Recognising the importance of science in navigating the complex world, ASM plays a critical role in analysing, developing, and providing scientific advice and policy solutions to the government. Backed by decades of scientific knowledge and a roster of science experts, ASM addresses STI-related issues of national and international importance in an independent, credible, relevant and timely manner.

INTEGRATING WATER RESOURCES MANAGEMENT FOR A SUSTAINABLE TOMORROW

ASM Water Committee continued to engage the government in 2018 on the implementation of National Integrated Water Resources Management Plan (NIWRMP). 2018 was a challenging year for the committee due to the restructuring of the Federal ministries post 14th General Election (GE14). The committee has taken stock of these institutional changes and prepared an Addendum to the earlier Transformation of the Water Sector: National Integrated Water Resources Management Plan (NIWRMP) – Strategies and Road Map report launched in December 2016.

A memorandum was sent together with the addendum to the Ministry of Land, Water and Natural Resources (KATS), MESTECC, and Ministry of Agriculture and Agro-based Industry (MOA) respectively in December 2018.

Focus group discussions were held for areas of interest such as Integrated Water Resources Management (IWRM) Awareness, Advocacy & Capacity Building and Water-Energy-Food Nexus with the intention of transforming them into full-fledged studies in 2019.

8TH WORLD WATER FORUM

NIWRMP was presented at the 8th World Water Forum, the world's biggest water-related event organised by the World Water Council (WWC).

17TH WORLD LAKE CONFERENCE

NIWRMP was presented at the 17th World Lake Conference, a globally recognised conference on sustainable management of lakes and basins.

ASM presentation on NIWRMP at both the events showcase Malaysia's readiness to impliment the plan at national level.

- Read the NIWRMP report.
- Read the addendum.

UNITING THE MALAYSIAN DISASTER RISK REDUCTION (DRR) SCIENTIFIC COMMUNITY THROUGH A FORGED ALLIANCE

The Disaster Risk Reduction Research Alliance Committee (DRR Research Alliance) was created to support the scientific community in Malaysia on disaster management. Together with the National Disaster Management Agency (NADMA), ASM organised the inaugural National Conference on Science, Technology and Innovation for DRR on 5-6 October 2017 to facilitate interaction among researches, policymakers, practitioners from government, civil society and industry on disaster management.

The DRR Research Alliance serves as the platform to bring together key researchers and other stakeholders in DRR to conduct flagship projects led by ASM. The DRR Research Alliance is chaired by Professor Joy Jacqueline Pereira FASc, with the support of Academician Professor Emerita Datuk Mazlan Othman FASc, and Ir Dr Zuhairi Abd Hamid FASc, as well as representatives from NADMA Malaysia, Meteorology Department of Malaysia, UKM Southeast Asia Disaster Prevention Research Initiative (SEADPRI-UKM), USM, UTM, UUM, UMS and UNITEN.

The DRR Research Alliance met twice in 2018 and key achievements are as follows:

- Papers from the inaugural National Conference on Science, Technology and Innovation for DRR to be published in the ASM Journal in 2019;
- Collation of inputs on the proposed National STI Plan for DRR from scientists engaged in DRR research in the country, where comments obtained have been channelled to NADMA Malaysia;
- Develop plans to highlight Malaysian DRR initiatives at the global level by convening two strategic conferences in Malaysia with NADMA Malaysia, SEADPRI-UKM, UNISDR and other partners; and
- Exploration of collaboration with the International Science Council Regional Office for the Asia Pacific (ISC-ROAP) via ASM, to establish open-access data on DRR to support community based early warning, drawing on S&T.

"THE MORE GOVERNMENT, UN AGENCIES, ORGANISATION, BUSINESSES AND CIVIL SOCIETY UNDERSTAND RISK AND VULNERABILITY, THE BETTER EQUIPPED THEY WILL BE TO MITIGATE DISASTERS AND SAVE MORE LIVES"

-BAN KI-MOON
FORMER UNITED NATIONS SECRETARY-GENERAL

SCIENCE OUTLOOK 2017: CONVERGING TOWARDS PROGRESSIVE MALAYSIA 2050

Driven by an extensive network of ASM Fellows and Associates, Science Outlook 2017 tracked Malaysia's progress in STI to realise our aspiration of becoming one of the top nations in the world in creativity and innovation. As evident from its theme, 'Converging towards Progressive Malaysia 2050', STI proficiency must be increased to transform the way STI is coordinated and propelled in Malaysia.

Malaysia's aspiration to be an advanced nation requires all sectors to have the capacity for developing knowledge capital. STI has underpinned the pillars of our economic growth for the last six decades since independence and should be seen as a catalyst to spur the new economy.

The Science Outlook 2017 retains the six strategic thrusts which were also used in the previous edition of this flagship study. These thrusts are based on the NPSTI 2013-2020. The findings of this study were presented during the launch in April 2018.

Former Minister of MOSTI, Datuk Seri Panglima Wilfred Madius Tangau launched the Science Outlook 2017, accompanied by ASM President, Professor Datuk Dr Asma Ismail FASc, and Science Outlook 2017 Chairperson, Professor Datuk Dr Halimaton Hamdan FASc.

6 STRATEGIC THRUSTS

1 STI GOVERNANCE

Fragmentation in the current STI ecosystem remains to be a significant hindrance that cripples efficiency and function in the service delivery to support a strong innovation ecosystem. Overall, optimal wealth creation and decision-making cannot be reached due to the redundancies present in resource distribution and lack of competencies by multiple stakeholders and support instruments.

The findings under this thrust is hoped to reverse the lack of effective STI governance in the nation in the last 15 years, which has caused the state of STI to become retrogressive.

2 RESEARCH, DEVELOPMENT & COMMERCIALISATION

Malaysia has embarked on a journey to actively harness knowledge to drive its economy since little more than two decades ago.

Despite having received significant annual contributions from both the public and private sector, Malaysia's efforts in R,D&C seems to be stuck in a "valley of death". We may excel in applied research but there is a dearth of experimental development, indicating a relatively miniscule amount of research have been translated into products and services for commercialisation.

3 STI TALENT

The shrinking talent pool entering IHLs for subsequent STEM training is a worrying trend as we may face a possible shortage of technological competent talent as the nation moves towards joining the next industrial revolution bandwagon.

Out of the estimated five million students enrolling in primary and secondary schools, only about 100,000 will choose STEM-related subjects and even fewer will continue their education journey with a STEM-related tertiary course. This number is slated to further reduce if no steps are taken to increase the students' interest in STEM-related subjects.

It was also found that STEM talent utilisation in Malaysia is not a straight forward matter of demand and supply, but rather a shortage of the right proficiencies and unmet compensation expectations.

4 STI ENERGISING INDUSTRIES

Malaysia may fare well in terms of global competitiveness, but we need to take into account that this country is unique as 98.5% of its business establishments are small and medium enterprises (SMEs). Therefore, there is a need to elevate the capacities of our industries, infrastructure, workforce competency as well as technology utilisation to be on par with global players.

From the horizon scanning exercise, this study identified that our national ecosystems are not able to enhance our innovative capabilities. Only 6% of Malaysian companies are creators. Market saturation as a result of being mostly imitators has rendered our products to be impotent globally.

Strategic partnerships models that are imperative to spur technology development, commercialisation and to accelerate the productivity growth of SMEs are lacking in this country, which are essential to turn SMEs into innovation intermediaries. That said, the existing intermediaries are not industry-led to foster demand-driven research, hence rendered ineffective in bridging the innovation chasm as well as to encourage open innovation.

The study also found that there is a weak link between multiple actors and multiple industry related knowledge dissemination channels. This weakness dilutes efforts of creating a successful innovation ecosystem.

5 STI ENCULTURATION

Informal science enculturation appears to have greater impact in nurturing a scientifically literate society. Malaysians are fortunate that there are various designated environments that serve as STI enculturation spaces. However, continuous efforts to keep these spaces current, exciting, and attractive to new and recurrent visitors must be in place.

Study of publicly available broadcast over a three-month period showed that Government television channels offer the most of in terms of STI content; private television channels had little to none.

Apart from regular news with science-related content, Malaysian newspapers have dedicated sections for Science coverage, but this was found to be significantly less content compared to Political and Sports coverage.

The prime choice of YouTube content favoured by Malaysians are entertainment and comedy channels, and not a single STI-related YouTube channel made it to Malaysia's top favourites. In essence, the trend shows Malaysians are inclined towards entertainment-based programmes.

6 STI STRATEGIC INTERNATIONAL ALLIANCE

Globalisation has transformed not just the economy of the world, but also how scientific resources, personnel, and research funding are no longer restricted by geographical borders in advancing scientific knowledge and finding solutions to global challenges. Malaysia and its people need to continue to take the lead in strategising and positioning Malaysia's standing at global platforms.

» • Read the full report. • Watch the launch video.

18 RECOMMENDATIONS

1. **Strengthen science planning and coordination through a centralised dedicated body**
2. **Establish a formal STI platform between federal and states governments in west Malaysia as well as Sabah and Sarawak**
3. **Emphasis on experimental development**
4. **Establish a multifunctional Research Management Agency (RMA) and to consider establishing a Technology Commercialisation Agency (TCA)**
5. **Re-identify national RDC priority areas**
6. **Development of regional innovation clusters**
7. **Attracting and retaining STEM talent through improved remuneration and continuous career development**
8. **Prioritisation of numerically and technically competent talent development**
9. **Development of biennial national STEM talent and skill gap assessment**
10. **Establish industry-led collaborative networks to enhance demand driven research and private sector participation**
11. **Facilitate dissemination and monitoring of industry related information through a virtual centralised knowledge repository and data centre**
12. **Public-private partnership to update and upgrade STI enculturation spaces**
13. **Virtual science media centre to strengthen STI content in various media platforms**
14. **Prioritise development of STI-based creative content**
15. **Leadership in positioning Malaysia's strategic STI international alliances**
16. **Enhance roles of science attaché in Malaysian Embassies**
17. **Strengthen linkages between Ministry of Foreign Affairs (MOFA) and Malaysian Scientific Community**
18. **Leverage Malaysia's trade platforms globally to facilitate market intelligence in STI-based industries**

PRECISION MEDICINE

ONE SIZE DOES NOT FIT ALL

Doctors have been treating patients with the same disease using the same approach – the same drugs and the same dose for the longest time. The difference in outcomes of the treatments especially recovery time and adverse effects strongly suggested that the genetic variants which differ between individuals must be taken into account. The current practice of one-size fits all is no more valid.

Precision medicine is an emerging but growing approach for accurate disease treatment and prevention strategies in which individuals' health care is tailored on the basis of their gene variability, the environment, and lifestyle. The genomics revolution has now paved the way for the practice of medicine to be personalised, predictive, preventive and participatory.

Globally, high-profile initiatives in precision medicine have been launched, allocating millions of dollars on research grants in the field. Countries such as the United Kingdom and the United States have taken the lead, and giant technology companies are also capitalising on the move towards precision medicine, having announced their interest to invest in procurements and foundations that advance artificial intelligence, machine learning, bioinformatics and other next-generation healthcare advancements.

As such, it is time for Malaysia to move along with the current disruptive trends in healthcare. We are fortunate to have such rich diversity of genomic data in our population which to date is perhaps only 0.01% tapped and characterised. In view of this progress, the Special Interest Group (SIG) on Precision Medicine Initiative for Malaysia was approved by the ASM Council on 12 September 2017. Professor Datuk Dr A Rahman A Jamal FASc has been appointed as the Chairman of this SIG.

This SIG will discuss and decide on the importance of the feasibility of the Precision Medicine Initiative for Malaysia. A comprehensive position paper will be submitted to the Government by Q4, 2019. The SIG with six members had its first meeting in November 2018 to scope and embark on this game-changing initiative for a future of healthier Malaysia.

MALAYSIAN ALLIANCE ON BLOCKCHAIN TECHNOLOGY

Blockchain and Electronic Distributed Ledger Technologies (EDLT) have the potential to support efficient and secure real time transactions across a large number of sectors thus present opportunities for disruptive innovation.

ASM established a Malaysian Alliance on Blockchain Technology led by Datuk Fadilah Baharin FASc. The main initiative of the Alliance is to produce a whitepaper to address the need for Malaysia to be prepared for the blockchain technology and EDLT in terms of strategic policy direction, regulatory framework and standards among others.

The Alliance consists of 17 agencies/ministries/ neutral entities which are as follows:

- ASM
- Bank Negara Malaysia (BNM)
- CyberSecurity Malaysia (CSM)
- Department of Personal Data Protection
- International Islamic University Malaysia (IIUM)
- Malaysia Digital Economy Corporation (MDEC)
- Malaysian Administrative Modernisation and Management Planning Unit (MAMPU)
- Malaysian Communications and Multimedia Commission (MCMC)
- Malaysian Industry-Government Group for High Technology (MiGHT)
- MIMOS
- Ministry of Economic Affairs (MEA)
- MESTECC
- Ministry of Finance (MOF)
- Ministry of International Trade and Industry (MITI)
- Mr A Fattah Yatim (Neutral entity)
- Security Commission Malaysia
- University of Malaya (UM)

The objective of the white paper is to enable the MESTECC to co-ordinate the roadmap development for blockchain technology in Malaysia through the establishment of a National Blockchain Committee towards integrated and coordinated implementation at the national level.

HALAL

TASK FORCE ON THE SCIENCE OF HALAL INITIATIVE IN MALAYSIA

"Halal" – which broadly means permissible in Islam – covers both products and services, and with the global Muslim population expected to increase by 2.2 billion by 2030, the demand for halal goods and services are expected to increase as well. The global market value for trade in halal food and non-food products is estimated at US2.3 trillion annually, one of the world's fastest growing markets.

Recognising the potential and enormous impact of halal industry for Malaysia and the need for Malaysia to strategically position its halal industry, ASM in 2017 established a Task Force on the Science of Halal Initiative led by Academician Tan Sri Dato' Ir Ts Ahmad Zaidee Laidin FASc. The objective of the task force is to formulate a position paper on the science of halal.

Based on preliminary findings, ASM has observed a crucial need for consolidated data and initiatives on the science of halal in Malaysia. This includes information on the current status of research and trained scientists related to the science of halal in the country as well as understanding the current challenges faced by the halal industry players that can potentially be addressed through science, technology and innovation.

In order for Malaysia's halal industry to grow and meet the future demands of halal goods and services, a built-in halal approach needs to be considered where STI can be used beyond the typical quality control and testing. Niche markets such as halal logistics need to be looked into, where emerging technologies such as blockchain is able to aid the manufacturers to trace and monitor and ensure the "toyibban" quality of halal products.

21 February 2018: Halal Science Strategic Planning Workshop 2.0

This workshop aimed to identify the issues, challenges and recommendations to improve the development of STI in the identified key sectors for halal science:

- **Pharmaceuticals**
- **Food and beverages**
- **Medical and healthcare**
- **Cosmetics and personal care**

UNDERSTANDING MACHINE LEARNING

The increased use of Artificial Intelligence (AI) has the potential to bring major social and economic benefits that cut across various sectors of the economy. AI enables computer systems to analyse, learn and process information at incredible speeds, far beyond the capabilities of humans.

In recent years, advances in machine learning (ML), a branch of AI that allows computer systems to learn directly from examples and experience to perform specific tasks, has garnered interest in both academia and industry.

Recognising the potential impact of Machine Learning to Malaysia, ASM established a Special Interest Group on Machine Learning (SIG ML) in May 2017. The aims of this initiative are:

- To determine the major changes at local, regional and global level that will promote the adoption of machine learning in Malaysia;
- To ascertain promising applications of machine learning that can be rapidly adopted in Malaysia;
- To explore key enabling factors that will enable adoption of machine learning;
- To catalyse linkages between academia and industry facilitated by government towards adopting machine learning; and
- To discuss way forward on machine learning adoption in Malaysia.

The SIG ML comprises 25 researchers in public and private universities and research institutions whose fields of research are mainly related to Machine Learning (ML).

3 May 2018: The SIG ML, in collaboration with Collaborative Research in Engineering, Science & Technology (CREST), organised the workshop on Strategic Enablement of AI and ML at USM, Penang with a total of 170 participants.

2 November 2018: A knowledge sharing session was held with Professor Dr Sarah Barman, Professor of Computer Vision at Kingston University, on the Role of AI in Transforming Healthcare at IIUM.

13 November 2018: The SIG ML collaborated with CREST to organise the Machine Learning for Small and Big Data Analytics in Healthcare and Manufacturing public lecture at UNITEN.

NATIONAL POLICY ON SCIENCE, TECHNOLOGY AND INNOVATION (NPSTI)

REVIEW AND FORMULATION STUDY

In support of the government's aspiration to make Malaysia a high-income developed country through the mainstreaming of STI, MESTECC has mandated ASM to review the current NPSTI 2013-2020 and formulate the new NPSTI 2021-2030. ASM appointed Dato' Professor Dr Awang Bulgiba Awang Mahmud FASc as the Project Director of the study.

The study is divided into two phases:
Phase 1: Review Study (Jul 2017 – Feb 2018)

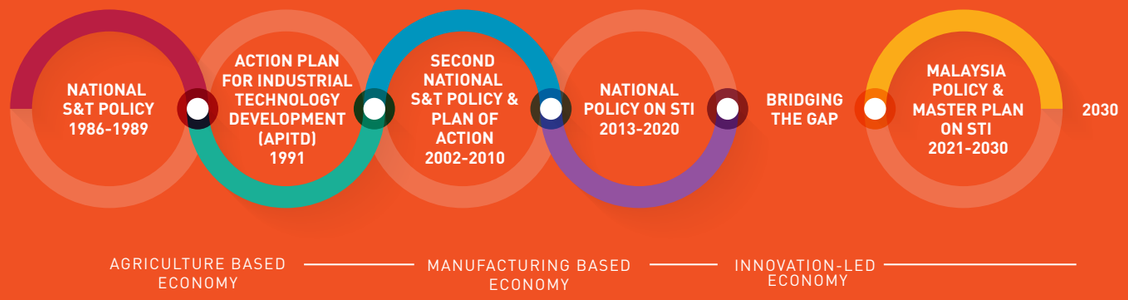
During the review process, it was found that the current policy is already very comprehensive, but it requires further enhancements to be more holistic and befitting with the times.

The review found that there are 48 policies with STI elements that have been introduced by different ministries in the country. Although the NPSTI is supposed to be the overarching policy on STI, other ministries were not aware that such policy is in place. In addition to that, only three out of these 48 policies measures contain measurable indicators. The lack of clarity was also evident in the derivation of some statistical data. The document could stand to be clearer in conveying its policy measures.

The review also found out that the current system does not have a dedicated governing body to ensure a more coordinated monitoring system. It is vital to ensure that the policy articulates the roles and responsibilities of the relevant agencies involved to ensure a more effective approach.

Phase 2: Formulation Study (Mar – Dec 2018)

The new policy was formed during this phase 2. Known as Future Acceleration through Science, Technology and Research Excellence (FASTREx) 2021-2030, the new policy is formulated with the goal of enriching lives, growing minds and shaping the future. It is designed to guide Malaysia towards becoming a more competitive and skilled country that is built with strong fundamentals in STI.



Future Acceleration through Science, Technology and Research Excellence (FASTREx) 2021-2030

6 STRATEGIC THRUSTS

INSTITUTIONALISING STI GOVERNANCE

01 Institutionalising National STI Governance through Legislative and Regulatory Framework

ADVANCING RESEARCH, DEVELOPMENT & COMMERCIALISATION

02 Realising Value-Added R&D Outputs

CREATING A STEM TALENT PIPELINE FOR A DEVELOPED MALAYSIA

03 Fortifying STEM Talent for the Future Workforce

ENERGISING INDUSTRIES

04 Sharpening the Competitive Edge Towards an Accelerated Innovation-driven Economy

STI ENCULTURATION

05 Inculcating a Science-thinking Society in Life and Living

ACHIEVING GLOBAL PROMINENCE THROUGH STRATEGIC INTERNATIONAL ALLIANCES

06 Preferred Global STI Partner in International Alliances

SCIENCE, TECHNOLOGY & INNOVATION MASTER PLAN (STIMP) 2020-2030 STUDY

Towards ensuring STI is mainstreamed for the nation's socio-economic development, MESTECC was mandated by the Government to develop a National STI Master Plan to support implementation of all policies related to STI (STI for Policy) as well as to realise the National Science Agenda and leverage on STI opportunities to achieve Rakyat-centric economic growth.

In view of its independence and the expertise of ASM Fellows, ASM was appointed as a strategic partner to formulate the STI Master Plan 2020-2030 from 1 July 2017 until 31 December 2018. In 2016, ASM appointed Dato' Dr Rahmah Mohamed FASc as the Project Director of the study.

The study is based on the five focus areas of Governance, Talent, Industry, Infrastructure and Economics & Finance, identified from the OECD Report on Malaysia's Innovation Profile (2013) as areas for improvement in the nation's STI development. Each Focus Area is led by ASM Fellows and Associates.

Throughout 2018, extensive stakeholder engagements with members of the industry, academia, policy makers as well as civil society were held with the following main objectives:

- Identify STI issues, gaps, challenges in five Focus Areas, and
- Validate strategies and action plans leading to issues identified

The central pillar of the STIMP is to identify situations in which collaborations and partnerships between various stakeholders can be harnessed, without losing sight of the ultimate need to best serve the people of Malaysia.

Governance
A robust Governance structure is imperative in order to drive and enhance the spectrum of STI management, funding, monitoring, evaluation and ideation as well as identifying global technology and market trends. Coordination of the efforts of multiple stakeholders and support instruments is crucial in creating an integrated STI ecosystem with higher efficiency, higher collaboration, and less duplication.

Talent
Talent is a driver for developing a robust and dynamic STEM ecosystem which supports the attainment of Malaysia's vision to be a high-income nation. Significant changes are needed in how talent is trained, re-skilled and up-skilled both before and after entering the workforce.

Industry
Industries must transform by adopting the smart and connected technologies of Industry 4.0 and beyond, and also invest in high-skilled workforce. Furthermore, industry-academia partnerships would facilitate demand-driven research and development for a more focused direction of near-to-market and return on investments by bridging the innovation chasm.

Infrastructure
Infrastructure for STI looks into fair and just economic development through fundamental services, facilities and systems spanning Digital, Physical, Environmental, R,D, C & I and Social Infrastructure.

Economics and Finance
Exploring new or improved models/ mechanisms of financial instruments for STI entails in-depth examination of the current economic and financial instruments/ mechanisms, and identification of the gaps/ deficiencies that needs to be addressed and improved.

MALAYSIA POLICY AND MASTER PLAN ON STI 2021-2030

A task force led by Professor Datuk Dr Asma Ismail FASc and supported by Dr Helen Nair FASc was established to conduct a harmonisation exercise for both the NPSTI 2021-2030 and STIMP 2020-2030 studies. The ultimate aim of the harmonisation exercise is to come up with a seamless, harmonised policy and master plan for STI in the nation (i.e. Malaysia Policy and Master Plan on STI 2021-2030). This exercise is to be carried out in the first quarter of 2019.

Post GE-14, the newly appointed Minister and Deputy Minister of MESTECC, YB Puan Yeo Bee Yin and YB Puan Isnaraissah Munirah Majilis, respectively, visited ASM on 19 July 2018. They were given an introduction on ASM's role and functions as a Thought Leader for STI-related matters. ASM EXCO members led the discussion on how the Academy can assist MESTECC in mainstreaming the STI Agenda, complementing the Ministry through science for policy and policy for science.

MID-TERM REVIEW OF MALAYSIA EDUCATION BLUEPRINT 2015-2025 (HIGHER EDUCATION)

The Malaysia Education Blueprint 2015-2025 (Higher Education) is an 11-year transformation plan of Malaysia's higher education designed to propel its stakeholders abreast with, if not ahead of, global challenges and trends through ten transformational shifts that are to be realised through 32 strategies and 71 initiatives.

This study intends to perform a thorough review of the level and effectiveness of the implementation, current achievements and challenges of the ten transformational shifts of this Blueprint. This review will also provide insights as input to national level policy studies and suggest improvements to the direction, strategies and initiatives of the present Blueprint.

This review is led by Professor Ir Dr Abdul Aziz Abdul Raman FASc. The findings of this study will be presented to the National Education Policy Committee (NEPC), an independent body set up by MOE. The NEPC is a 13-member Committee comprising experts to study the nation's education policies, from October 2018 to April 2019.

10 TRANSFORMATIONAL SHIFTS

1. Holistic, Entrepreneurial and Balanced Graduates
2. Talent Excellence
3. Nation of Lifelong Learners
4. Quality Technical and Vocational Education and Training (TVET) Graduates
5. Financial Sustainability
6. Empowered Governance
7. Innovation Ecosystem
8. Global Prominence
9. Globalised Online Learning
10. Transformed Higher Education Delivery

AN IMPACT STUDY OF THE IMPLEMENTATION OF THE MALAYSIAN RESEARCH UNIVERSITIES

Malaysia Research Universities (MRUs) are key enablers of Malaysia's national innovation ecosystem and knowledge economy. These universities also promote economic growth, competitiveness of local industries, and improve socioeconomic wellbeing of the Rakyat. In September 2006, UKM, USM, UM and UPM were named as the pioneer group of MRUs. UTM achieved the status of the fifth MRU in 2010.

This study chaired by Professor Dr Mahendhiran Sanggaran Nair FASc aims to re-evaluate the role, impact and direction of MRUs. MRUs are an important catalyst in transforming Malaysia into a regional and global centre of educational and research excellence. As such, a critical analysis of current achievements, performances, issues, challenges and gaps will also be provided.

A comparative overview of global impacts and outcomes of similar universities abroad will be carried out and recommendations to strengthen the internal research ecosystems of the MRUs will be put forth. This study will also propose a strategic framework to strengthen research collaborations between the MRUs to capture knowledge network externalities that will enhance the national innovation ecosystem and Malaysia's global competitiveness.

PROVIDING STRATEGIC INPUT

The Academy has continuously provided strategic input to government ministries and agencies based on ASM's previous and currents studies that were led by ASM Fellows who are experts in the related fields.

MESTECC
- *MJM Kementerian Belia dan Sukan: Semakan Semula Jawatankuasa Kabinet Pembangunan Belia*
- *Draf Akhir Laporan Kajian Pembangunan Pelan Induk Kebangsaan Latihan Teknikal dan Vokasional (TVET) ke Arah Negara Maju*
- *Mesyuarat Penyelarasan Status Pencapaian Semasa KPI 500 Set Data Terbuka*
- *NJM MESTECC: Pembangunan Industri Mobiliti Elektrik*
- MESTECC ICoE Nexus Initiative
- *Bahan Rujukan atau Maklumat Berkaitan STI Enculturation*
- *MJM KeTTHA: Pelan Halatuju Industri Solar Malaysia 2030*
- Minister of STI's Column 'Recognising Scientists'
- *Bengkel Pengukuhan Tadbir Urus Ekosistem R,D,C&I Negara*
- *Bengkel Pemurnian Senarai Pekerjaan S&T dan STEM*

Malaysia Power Nuclear Corporation
- *Kaji Selidik Penerimaan Awam Terhadap Penggunaan Tenaga Nuklear Sebagai Salah Satu Sumber Janaan Elektrik Negara*

PEMANDU Associate
- Discussion on TN50 Study for Plantation and Commodities Sector

TN50 OGEE Committee Members
- Discussion on TN2050 Oil, Gas, Energy and Environment (OGEE)

Agensi Keselamatan Siber Negara
- *Bengkel Semakan Semula Dasar Keselamatan Siber Negara dan Pembangunan Strategi Keselamatan Siber Negara*

Invest Selangor
- *Sesi Percambahan Fikiran untuk Kajian dan Penyediaan Pelan Tindakan Hala Tuju Industri Halal Negeri Selangor*

MIGHT
- Malaysia Blockchain and Distributed Ledger Technology Outlook 2019 Report: Blockchain in Government Consultative Session

MITI
- Workshop on Developing the Implementation Plan of National Industry 4.0 Policy Framework (Industry 4WRD)

Ministry of Water, Land and Natural Resources
- *Bengkel Penyediaan Terma Rujukan bagi Kajian Dasar Air Negara*

MyIPO
- *Sesi Konsultansi Penambahbaikan Dasar Harta Intelek Negara*

Malaysian Water Partnerships
- Malaysia Water Resources Management Forum

MESTECC and Malaysian Green Technology Corporation
- Input for briefing YB Minister MESTECC on 3rd National Car

REACHING OUT TO THE GOVERNMENT

In fulfilling its mandated role as a 'Thought Leader' in STI, ASM forwarded three memoranda to the Government.

MEMORANDUM ON STI GOVERNANCE

ASM believes that STI governance is pivotal in providing leadership and strategic direction to take the STI agenda of the nation forward towards enhancing productivity, growth and social transformation. The Memorandum identified three key challenges: weak STI governance, fragmented and disconnected STI landscape, and ineffective resource allocation and diluted impact.

The Memorandum was forwarded to the Hon. Prime Minister on 11 June 2018

ASM President met the Hon Prime Minister on 24 July 2018

MEMORANDUM ON MALAYSIA'S INNOVATION ECOSYSTEM

The Memorandum highlighted the need for a fully-functioning innovation ecosystem that is able to bridge the innovation chasm for a progressive, prosperous, harmonious and sustainable Malaysia based on advanced S&T. It also mentioned that the role of STI is critical in initiating and sustaining the development of a knowledge-based economy and society. In addition, collaborative innovation networks can bring together the creative forces that lie largely untapped within the quadruple helix, to bring about rapid economic development that will initiate widespread social transformation.

The Memorandum was forwarded to the Council of Eminent Persons (CEP) on 9 July 2018.

ASM presented the memorandum to the CEP on 19 July 2018.

INPUT ON INSTITUTIONAL REFORM FOR BETTER STI GOVERNANCE

This input highlights the need to look into necessary institutional reforms for better STI governance to realise an effective and efficient national STI ecosystem. The input also serves to review the mandates, roles, and functions of key institutions in Malaysia's STI landscape for the purpose of streamlining them for more effective STI governance, decision making and resource allocation.

The input was forwarded to the Committee for Institutional Reforms on 25 May 2018.

ENGAGING SCIENTISTS, EMPOWERING SOCIETY

ASM STRONGLY EMPHASISES THE ESSENTIAL ROLE SCIENCE PLAYS IN THE WELL-BEING OF THE SOCIETY BY MAKING IT RELATABLE TO EVERYONE VIA SCIENTIFIC PROGRAMMES.

Science has long been challenged or misunderstood. It is usually correlated as a difficult and textbook-driven field, making public lose interest in science. In actual fact, science is a fascinating subject that dictates our everyday life – and this is the message that ASM is trying to spread through its initiatives.

ASM also empowers the scientific community by organising a multitude of programmes through collaboration with national and international institutions and organisations.

SHAPING FUTURE STEM TALENT

From a humble beginning, NSC has undergone continuous evolution to improve its quality as well as adapting to the current scientific landscape in curating its content. As one of the most significant science competitions for secondary school students in Malaysia, NSC strives to build the capacity, capability and competency of young generation in STEM to become future leaders that are well-equipped with the necessary skills to meet the challenges ahead.

STATE LEVEL: The introduction of Wild Card Teams (combining three top individual participants into a team) and a three-minute pitching session on STEM topics has contributed in improving the students' presentation and communication.

SEMI-FINAL: An intensive seven-day science camp themed "Smart Community" where participants were trained to adopt scientific thinking, explore the philosophical and applied dimensions of smart community-related topics as well as developing inventions that could support and create a smart community. They also learned effective ways to communicate science and how to pitch an invention from a group of outstanding young scientists.

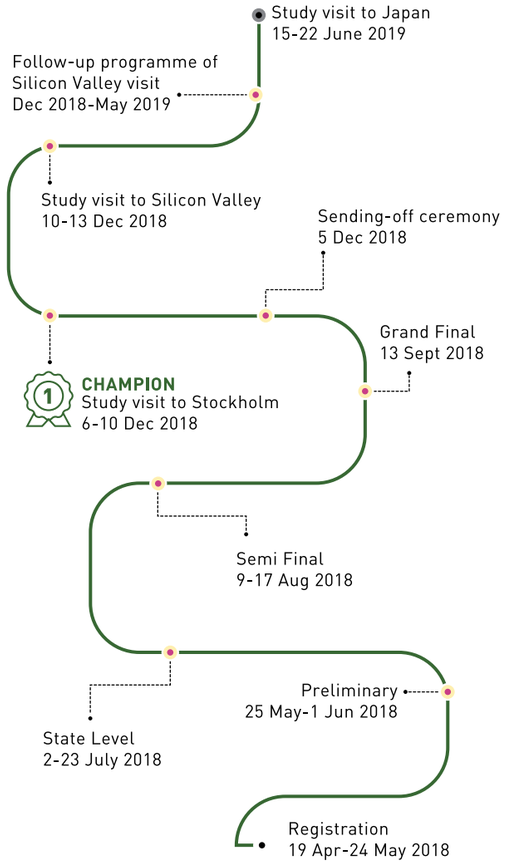
GRAND FINAL: After a week-long at science camp, finalists advanced to the stage where they are tested in the form of an interactive science quiz. Besides that, they have to win the judges with their confidence in presentation skill.

Champion: The Prime Minister's Challenge trophy, cash prize and a study visit to Stockholm, Sweden.

2nd place: Cash prize and a study visit to Silicon Valley, U.S

3rd and 4th place: Cash prize and the opportunity to participate in a study visit to Japan under the Sakura Science Exchange Programme

- View the photos.
- Read the news coverage.
- Follow NSC social media.



6,450
STUDENTS PARTICIPATED IN 2018

CHAMPION
SMK KING GEORGE V, SEREMBAN

2ND PLACE
MRSM TUN ABDUL RAZAK, PAHANG

3RD PLACE
KOLEJ YAYASAN SAAD, MELAKA

4TH PLACE WILD CARD TEAM
KEDAH COMPRISING STUDENTS FROM SMJK SIN MIN, MRSM LANGKAWI & MRSM KUBANG PASU

FOSTERING FRIENDSHIP THROUGH SCIENCE AMONG ASEAN COUNTRIES

In 2018, Malaysia had the honour to host the 7th ASEAN Plus Three Junior Science Odyssey (7th APT JSO). This year, students from ASEAN and the Republic of Korea flew to Malaysia to enjoy four-day competition filled with exciting challenges such as the Great Science Pitch, Great Science Quest, and Great Science Ideas. Members of the YSN-ASM lent a hand in guiding the students in science communication skills.

The competition was organised by MESTECC, ASM and YSN-ASM in collaboration with UPM and several ministries and Government agencies.

A camp is incomplete without a cultural night. The diverse cultural background of ASEAN region was celebrated during the Great Cultural Night, a night of cultural exchange to remember. Dances, songs, traditional attires; it was a night to showcase talent.

The APT JSO piqued the gifted students' interest and fed their curiosity in STEM; it also opened a path for them to build their network, foster friendships and encourage cross-cultural exchange.

Great Science Pitch | **Great Science Ideas** | **Great Science Quest** → **7th APTJSO Modules**

7th APT JSO // 29 July - 3 August 2018 // UPM

- Participation from nine countries:
  - 19 teams
  - 18 teachers
  - 57 students
  - 3 observers

WINNER
Philippines
Team B
(Philippines Science High School, Soccsksargen Region)

1ST RUNNER-UP
Malaysia
Team D
(Sekolah Menengah Sains Kuching)

2ND RUNNER-UP
Republic of Korea
Team B

• View the photo gallery. • Watch the highlights. • Read our coverage of the event.

SHAPING MIND, CRAFTING INVENTIONS

SCIENCE UNITES, INNOVATION DECIDES

2018 marks Malaysia's second participation in the 2nd One Belt One Road Teenager Maker Camp and Teacher Workshop, upon invitation by the China's Children & Youth Science Center of CAST (CYSC).

The stellar performance of students from Sekolah Menengah Sains Kuching during the 7th APT JSO earned them the opportunity to represent Malaysia.

From creating a scale model of a Turkish house, to creating an immersive video using virtual reality technology, the programme has greatly enriched our young talents from the Land of the Hornbills in the knowledge of developing STEM inventions. Continuing Malaysia's excellent performance from the previous year, they have been awarded Best Teamwork and Best Maker of the year.

This year, the delegation had the opportunity to share the success stories of ASM's Inquiry Based Science Education (IBSE) initiatives in a dedicated forum on science education.

2nd One Belt One Road Teenager Maker Camp & Teacher Workshop // 15-21 November 2018 // Beijing, China

• View the photo gallery.
• Read our coverage of the event.

BUDDING INNOVATORS

The minds of the young generation are treasure-trove of ideas that may hold the key to solving global and regional issues. It is never too early to start picking their minds and let these ideas come into realisation. The Young Makers Programme is one such programme for budding innovators to be discovered.

The Young Makers Programme featured an innovation boot camp that equipped participants with the skills in the development of innovation projects, programming, design thinking, and project prototyping. Participants rubbed shoulders with experts from industries and universities, who acted as mentors in sharing their knowledge and expertise, in addition to syncing current market demand with STI development.

TWO CATEGORIES:

5 Schools

ARDUINO

SMK Abdullah Munshi
• Arduino Elderly Health Monitoring System Kits

SM Sains Tun Syed Sheikh Shahabudin
• Underground Fuel Tank Indicator

MICROSCALE CHEMISTRY

MRSM Transkrian
• The Optimum pH Level for Effectiveness of Calamine Soap Bar to Heal Skin Disease

MRSM Balik Pulau
• The Safest Water during Drought

SMK Penang Free
• Application of Microscale Kits on Various Chemical Testing

14 Schools

4 Schools

Phase 1
Pre-bootcamp 2018
10-11 Oct 2018

- Programme briefing
- Computational Thinking
- Technical Training
- STEM Awareness Talk

Phase 2
Makers Innovation Challenge
20 Oct 2018

- Makers Innovation Makeathon
- Closing and Award Ceremony

69 STUDENTS FROM
23 SCHOOLS IN THE NORTHERN REGION

• View the photo gallery. • Read our coverage of the event.

"STEM" UP YOUR GAME!

When an international company with the desire to nurture the interest of children in STEM meets an organisation that has interest in mainstreaming STEM in the country, the result is a programme that benefits both sides, while immensely enriching its students.

ASM believes that industries can be a crucial component in nurturing and instilling the love for STEM in school students. ASM through YSN-ASM showed its full support to CCM in making the STEM Up Challenge a success.

Throughout the programme, students were challenged with a comprehensive STEM quiz and were required to complete science projects. Sekolah Menengah Perempuan Temenggong Ibrahim proved to be the best among the best by becoming the Champion of this competition. Meanwhile, the Most Outstanding Science Project award went to Sekolah Menengah Kebangsaan Seri Gading.

Preliminary: 2 – 14 April 2018 // Minggu Sains Negara

Semi-final and Final: 24 April 2018 // Batu Pahat, Johor

1,550 STUDENTS (PRELIMINARY ROUND)

600 STUDENTS (SEMI FINAL & FINAL)

• View the photo gallery. • Read our coverage.

ADDRESSING THE GAP BETWEEN SCIENCE AND SOCIETY

Science is fun and interesting; better yet, it could be a viable career path. Unfortunately, it does not appeal to everyone. The interest level of Malaysians in science was found to be low compared to other countries.

Science is all about exploration and discovery. There is no better way to get the public, especially the young ones, excited about science than with hands-on activities and experiments. With this in mind, MESTECC launched the National Science Week 2018 for the first time, with the theme *"Negaraku Berinovasi"*.

The result of collaboration between ASM, Johor State Government, and 15 strategic partners, *Minggu Sains Negara* Johor State Level was successfully held at Sekolah Menengah Kebangsaan Agama Segamat, carrying the theme *"Luaskan Inovasimu."* Visitors, especially students, enjoyed the excitement of interactive and stimulating science-related activities.

1,550 secondary school students from Segamat took part in a quiz and delivered their projects in the CCM STEM Up Challenge.

32 secondary school students showcased creative solutions to everyday problems in the Innovation Competition.

85 Secondary school students participated in the I-STEM Challenge.

50 teachers have been educated on how to enrich and enhance their students' learning experience in STEM through the IBSE & STEMazing Workshop.

YSN-ASM engaged the public on science topics via programmes such as Science Café and Sembang Sains.

4,000 estimated number of visitors that came to the three-day event.

Minggu Sains Negara // 2-7 April 2018 // Held Nationwide

- View the photo gallery.
- Read our coverage of the event.

PRESERVING NATURE FOR SUSTAINABLE DEVELOPMENT

The natural environment is an important commodity that benefits all members of an ecosystem. Therefore, it is important to protect these areas of geological significance. At the same time, people should be educated about its importance, while also generating income for its surrounding population.

Hence, geoparks are set up to provide a holistic concept of protection, education and sustainable development. These natural reserves utilise a bottoms-up approach by combining conservation with sustainable development while involving local communities.

The 2018 Malaysian Technical Cooperation Programme (MTCP) Global Geopark Planning and Development Workshop was organised to provide valuable insights on the fundamentals of planning and developing a geopark.

16 local and international participants attended a series of lectures, workshop sessions and field visits to several geosites around Langkawi and Jerai Geopark. Knowledge and skills in the various Geopark management approaches and techniques were shared by the speakers and instructors to facilitate the participants in implementing them in their respective countries.

MTCP Global Geopark Planning and Development Workshop // 16-20 September 2018

- View the photo gallery.
- Read our coverage of the workshop.
- Visit the website to find out more.

PROMOTING A CULTURE OF SAFE AND SECURE SCIENCE

Scientists and researchers from MESA region gathered at the Conference to Promote Safe and Secure Science in the Middle East/North Africa, and South/ Southeast Asia to discuss and share best practices in promoting awareness on safe and secure science among the region. Focused on life science topics of interest and relevance to the MESA region, the participants deliberated on main issues such as research, science policy, ethics, responsible science, research integrity, and public engagement.

The Responsible Conduct of Research (RCR) Educational Module was launched in conjunction to the Conference.

93 Participants from 13 countries

6 Invited speakers from Algeria, Malaysia, and Indonesia

6 Malaysian participants won Best Poster Awards

Conference on Safe and Secure Science // 5-9 February 2018 // Sunway University

- View the photo gallery.
- Read the news coverage.
- Read our coverage of the event.

AWARDS AND GRANTS

Awards and grants are the key boosting factors for excellence among scientific community that signifies their contribution and achievements. This recognition is important for the scientists and researchers who have carried out significant scientific research that addresses local and global challenges, in addition to position Malaysia strategically in the eyes of the world.

ASM draws upon the expertise of Fellows to serve as members of evaluation and monitoring panels for various awards and grants. They are engaged for their expertise in their respective fields, to select outstanding scientist and technologist that exhibited prominence in their research pursuits.

CAN WE KICK CANCER OUT FOR GOOD?

Cancer: A powerful word that evokes strong feelings – usually 'fear'.

Malaysia possesses a pool of scientists in the field of cancer research, who seek to understand the disease, improve its detection and treatment methods. Opportunities and funding must be provided to let them continue their noble work.

Every year, ASM Fellows contribute their expertise to MAKNA in awarding deserving young Malaysian researchers with a research grant towards this cause. Those who exhibited great passion and excellent track record in cancer research have been awarded with an incentive to drive their research further.

2018 Award Recipients

1) Dr Tee Yee Kai, UTAR
Novel Chemical Exchange Saturation Transfer Magnetic Resonance Imaging (CEST MRI) for Brain Cancer Diagnosis and Treatment Monitoring

2) Dr Amirah Abdul Rahman, UiTM
Identification of the role of equilibrative nucleoside transporter 2 (ENT2) in modulating colorectal cancer cell death by RNA interference

3) Vimalan Rengganaten, UTAR
Elucidation of candidate circular RNAs as predictive molecular markers of chemoresistance in colorectal cancer and colorectal cancer stem cells

» • View the photo gallery. • Read our coverage of the event.

CONTINUING THE LEGACY OF DR RANJEET BHAGWAN SINGH

The biggest discoveries could come from the smallest research. Viewing the importance of pushing early career researchers towards success in their research, the late Dr Ranjeet Bhagwan Singh posthumously contributed a portion of his wealth towards providing a grant for them to supplement their research.

2017 Grant Recipient
Dr Sharmili Vidyadaran, UPM
Mesenchymal stem cells ameliorate microglia-driven neuronal damage

SPECIAL GRANTS FOR STRATEGIC SCIENTIFIC RESEARCH

NPSTI Flagship Programme
The project titled "Moving up the Value Chain and Environmentally Friendly Processes in Silicon Photovoltaic Technology: Non-toxic Processes, Wafering and Crystal Growth" was identified to be impactful on the development of STI as well as aligned with the Government Transformation Programme (GTP) and the Economic Transformation Programme (ETP).

This project has led to the indigenous technology enhancement from solar cell manufacturing to wafers with significant economic benefits to Malaysia.

Professor Dato' Dr Kamaruzzaman Sopian FASc received the grant in 2014 and the project has completed in May 2018.

Special Allocation for Agencies under MESTECC
The project titled "Development of Yeast System for Flavonoid Production" was identified to have impact on the development of STI and aligned with the New Economic Model (NEM).

This project has established an advanced production technology for the production of plant flavonoids in yeast system.

Emeritus Professor Dr Normah Mohd Noor FASc received the grant in 2014 and the project was completed in February 2018.

ANUGERAH SAINTIS MUDA NEGARA 2018

This award by MESTECC recognises young Malaysian scientists for their contribution and achievement in research and development.

2018 Award Recipient
Dr Oon Chern Ein , USM
A novel sirtuin inhibitor: Co-targeting cancer cells and the tumour vasculature as a therapeutic strategy in cancer

ANUGERAH JURUTEKNOLOGI NEGARA 2018

This award by MESTECC recognises technologists and semi-professionals, such as technicians and laboratory assistants, for their contribution and achievement in the field of science and technology.

2018 Award Recipient
Wan Saridah Wan Omar, MPOB
Peningkatan nilai sawit melalui pembangunan produk hiliran

DELIVERING QUALITY PROJECTS

Project Monitoring Teams (PMT) make sure that projects are right on track and its resources are well-managed. ASM Fellows share their wisdom and knowledge in guiding the project to completion.

ASM was appointed to monitor selected approved R&D projects since 2007. A total of 17 projects have been completed in 2018.

Research projects monitored by ASM from 2007 - 2018:

10	**TechnoFund**
3	**Community Innovation Fund**
4	**Flagship**
17	**Total number of projects**

NEWTON-UNGKU OMAR FUND

Partnership between the UK and Malaysian Government is continued this year through the NUOF. The fund aims to develop research network among the multi and inter-disciplinary researchers through the integration of STI knowledge that address socio-economic issues in Malaysia.

Activities of the fund range from:
a) Growing capacities of the Malaysian science and innovation community through fellowships, mobility schemes and joint centres.
b) Forging research collaborations on development topics.
c) Establishing innovation partners and challenge funds to develop innovative solutions on development topics.

ASM as one of the local delivery partners of NUOF has implemented few programmes in collaboration with prominent UK delivery partners.

Newton Advanced Fellowships
Grants for training, collaboration, and reciprocal visits to develop the research strengths and capabilities of research group

Newton Mobility Grants
Grants for travel, subsistence, and research expenses for visits to strengthen the research and innovation capacity of local researchers

2018 Mobility Grant in Natural Sciences
- Two awardees
- Grant awarded : £24,000

2018 Mobility Grant in Social Sciences and Humanities
- One new awardee
- Grant awarded : £12,000

UK-Malaysia Bilateral Health Research Collaboration Programme in Non-communicable Diseases (NCDs)
Bilateral collaboration between the Malaysian and UK researchers in Medical and Health Sciences to provide solution on the current rising health issues in Malaysia.

Newton Researcher Links
Stimulate initial links and support capacity building among the early career researchers.

Five social innovation projects were established from Newton Researcher Links Workshop on Social Innovation through Team Entrepreneurial Learning. The projects are:

THE CONVERGENCE OF **TWO DIVERGENT ROADS**

CAN DATA AND EXPRESSION MIX?
To those unfamiliar with either art or science, both disciplines seem like totally opposite; one is data-driven, and the other is emotion-driven. Traditionally, art is viewed as a product of expression while science is an exploration of the reality to find the universal truth.

ASM ArtScience Prize is an initiative to recognise outstanding creations of applied arts that showcase the fusion of art and science.

A Coffee Chat with Ar Hijjas Kasturi FASc, Chairman of the Prize's Task Force, was organised to introduce the ArtScience initiative as well as attract potential sponsors for the Prize. The casual session saw attendees share their experiences in conducting, contributing or attending art and science related programmes and events, as well as suggesting initiatives that can be implemented to reach wider audiences.

A Coffee Chat with Ar Hijjas Kasturi FASc // 13 October 2018

GLOCALISING THE IMPACT

The YSN-ASM has made tremendous contribution in many initiatives through its members and affiliates. They also spread their wings and made an impact at the international level.

The positive impact and influence of YSN-ASM was evident through the successful completion of over 50 programmes in science outreach, science education, science communication, science leadership, science policy, science integrity, and international networking.

Malaysian Educational Module on Responsible Conduct of Research (RCR)

Fostering a culture of research integrity in the Malaysian scientific ecosystem

7th ASEAN Plus Three Junior Science Odyssey (APT JSO)

Designing the competition content as well as driving the implementation of an international science competition

National Science Challenge

Largest group of members prepared this year's questions and modules

***Minggu Sains Negara* & 2018 Kuala Lumpur Engineering & Science Fair (KLESF)**

STEM exhibition booths and Science Talks

2018 YSN-ASM COLLOQUIUM

Carrying the theme "Glocalise the Impact", 2018 YSN-ASM Colloquium brought together 86 YSN-ASM members and affiliates at Bukit Tinggi, Pahang from 7-9 December 2018. The annual event was organised to celebrate every individual's professional and personal accomplishments and YSN-ASM's collective impact. In addition, it was also held to strategise YSN-ASM's programmes and activities in 2019.

The Colloquium witnessed Dr Chai Lay Ching took over as the new chairperson of YSN-ASM from Professor Dr Abhi Veerakumarasivam, becoming the first woman to chair YSN-ASM. More focused and concerted efforts on flagship programmes will be implemented to maximise the impact with the aim to groom leaders to champion various activities or initiatives by YSN-ASM.

2018 : 10 NEW YSN-ASM MEMBERS WERE APPOINTED

40 NEW AFFILIATES WERE SELECTED

NATIONAL SCIENCE CONSORTIUM

In strengthening Malaysian R&D towards the socio-economic transformation of the nation, National Science Consortium initiative was implemented since 2013 to champion national concerted efforts in STI strategic areas. This was carried out through the establishment of a focal point for inter-institutional and international collaboration.

The mission of the establishment is to internationalise Malaysian R&D while simultaneously increase the output of high impact research. ASM also wishes to find local and international partners to champion the STI strategic areas to develop outstanding scientists. Besides that, the programme aims to facilitate Centres of Excellence (COEs) abroad to find "strength-to-strength" centres to collaborate with, for ASM to participate in large global scientific projects.

MALAYSIA INSTITUTE FOR INNOVATIVE NANOTECHNOLOGY (NanoMITe)

As a global research consortium consisting of 100 top-level nano-scientists from the world-class academic institutions and centres, Malaysia Institute for Innovative Technology (NanoMITe) strives to:

- Provide a global platform for research, develop and strengthen local capability and capacity on nanotechnology;
- Drive nanotechnology-based industry for economic growth and societal well-being;
- Support Government implementation on Distributive Economy by focusing on active local and global participation of world-class nano-scientists; and
- Promote science, research culture and knowledge economy.

NanoMITe has 19 projects under five flagship programmes:

- Energy
- Wellness, Medical and Healthcare
- Food and Agriculture
- Electronics, Devices and Systems
- Environment

In 2018, NanoMITe has participated in Educational Research Cluster under the Indonesia-Malaysia Research Consortium (IMRC) with several universities in Indonesia. In addition to that Electronics, Devices and Systems research team visited Harvard University and Massachusetts Institute of Technology (MIT) from 10 Jul–8 Aug 2018 for collaboration purposes.

NATIONAL CENTRE FOR PARTICLE PHYSICS (NCPP)

National Centre for Particle Physics (NCPP) is leading the national exploration in experimental particle physics research through the engagement in impactful theoretical physics research as well as high energy and particle physics efforts with these international centres of excellence:

- Compact Muon Solenoid (CMS), European Organization for Nuclear Research (CERN), Geneva, Switzerland
- Deutsches Elektronen Synchrotron (DESY), Hamburg, Germany
- High Energy Accelerator Research Organization (KEK), Tsukuba, Japan
- Osaka University, Osaka, Japan

IMBAK CANYON RAINFOREST RESEARCH

The Sabah Foundation has built the Imbak Canyon Studies Centre (ICSC), a facility within the core zone of the Imbak Canyon Conservation Area (ICCA) in Tongod, Sabah. ICSC provides world-class research facilities for researchers to carry out research related to rainforest ecosystem and biodiversity ranging from forest taxanomy to climate change.

In 2018, a workshop on Imbak Canyon: Producing Internationally Acclaimed Leaders in Tropical Rainforest Research was organised by ASM to introduce and promote Imbak Canyon and encourage Malaysian scientific community to take on the opportunity to do research at ICSC.

Imbak Canyon: Producing Internationally Acclaimed Leaders in Tropical Rainforest Research // 4 April 2018

• View the photo gallery.
• Read our coverage of the event.

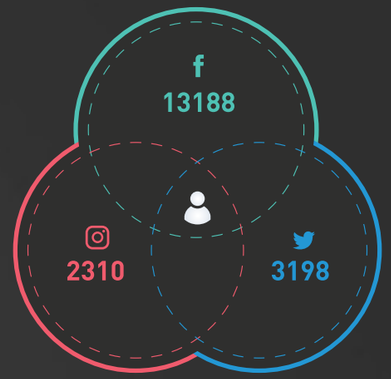
BE SEEN.
BE HEARD.
EXPERIENCE.

We believe in sharing information through simple communication. In ASM, we turn "**why does it matter?**" into captivating visuals and writings to share the joy of discovery to all. Every like or retweet is a result of a garnered interest from the masses, and we value each interaction. Transforming scientific pursuits into relatable stories while keeping its essence unchanged is a life-long venture for us here in ASM. Let us share our milestones on the virtual world with you.

WE WELCOME COLLABORATION WITH YOU !

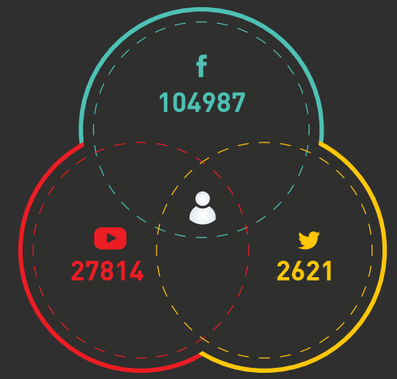
Drop us an email at:
science_comm@akademisains.gov.my

Social Media Communities



TOTAL: 18,835

Video Views



TOTAL: 135,422

Expanding Your Insights with Aesthetics

Each study has its own significance. None is less than the other. Through our publication, we wish to create awareness on the current happenings in the Malaysian STI landscape. We want policy makers to have a better understanding in making informed decisions. By making our publication accessible to the people, we also hope to continue inspiring a cultivated community.

Number of publication:

Advisory Report 4

Position Paper 2

Scientific Book 2

Conference Report 1

ASM Science Journal Articles 17

Annual Report 1

Online readerships (ISSUU):

Read
30,587

Impression
339,478

BRIDGING SCIENCE GLOBALLY

CONNECTING, POSITIONING AND COLLABORATING FOR A BETTER FUTURE IN COMBATING GLOBAL CHALLENGES

It is impossible to stop learning in today's world. Scientists globally are forming the links on how to co-learn and co-create to achieve the SDGs by 2030. Among the global issues that were debated in 2018 were health, education, gender equality, productivity, innovation, climate change, water and emerging technologies. ASM has actively participated in 34 international meetings and conferences related to such issues and has been giving input through international declarations, resolutions and forming regional platforms for all involved to work together.

Making Water Everybody's Business

In 2015, WHO stated that 1.8 billion people are still using water from contaminated sources. This resulted in 250,000 children under the age of five to die each year of diarrhoea. To address this issue, The Association of Academies and Societies of Sciences in Asia (AASSA) comprising 34 scientific and technological academies and science societies in Asia and Australasia chose waterborne infectious diseases as one of the main agenda to be tackled in 2018. With that, ASM hosted the International Waterborne Infectious Diseases Conference, bringing global experts from different water-related disciplines to share their experiences in tackling the issues.

Our commitment towards water issues does not stop there. ASM also participated in the 8th World Water Forum in discussing sustainable water resources through effective global water management and distribution. It is estimated that two out of three people will live in water-stressed areas by the year 2025. There is an understanding that water scarcity is a regional problem; only through collaboration, instead of national interest, would result in a win-win for all.

International Waterborne Infectious Diseases Conference // 15-16 August 2018 // Kuala Lumpur, Malaysia

- View the photo gallery.
- Read the resolution.
- Read our coverage of the event.

Preparing Leaders of Tomorrow

Youths make up a large portion of the ASEAN Community. It is estimated that about 60% of ASEAN population is under 35 years of age. They are the change makers of this region. We need to build the right ecosystem and platform in order to harness their potential and impact in STI that will shape our future.

ASEAN young leaders need to be actively involved in various collaborations to develop a life-long learning ecosystem within ASEAN. Through this approach, we can finally catch up with the developed nations that are always a step ahead. This could also take us from being followers to becoming leaders.

This year, ASM created a major push by proposing an ASEAN Young Scientists Network and formed an ASEAN Foresight Alliance. To engage with the ASEAN Young Leaders in STI, ASM organised the ASEAN Young Leaders Forum in Cebu, Philippines to discuss the importance of designing a sustainable future for the region using foresight as a tool. More than 40 ASEAN leaders gathered at the forum that prepares them to embrace future disruptions and promote sustainable leadership for a progressive ASEAN. In conjunction with the forum, the ASEAN Young Scientists Network was launched; ASM hopes that this platform will be an accelerator for the region's young leaders to have more engagements with policy makers in charting our future.

ASEAN Young Leaders Forum // 18 October 2018

- Watch the ASEAN Young Scientists Network Launch.
- Read our coverage of the event.

The Spirit of Collaboration

This year, we are taking the concept of collaboration to the next level with an in-depth look at sharing of data, information, knowledge and expert in STI. We aim to connect all these elements on a regional level to solve common issues such as health, climate change and bio-nexus conflicts that are a cause for concern regionally and globally.

In today's fast-paced world where the need to adapt and transform network and business processes is critical for survival, no single individual, organisation or nation has all the answers. A culture of collaboration with a shared vision is crucial. Looking into this, ASM at the 12th APEC Policy Partnership for STI Meeting in Papua New Guinea proposed for APEC to initiate the Open Science Initiative to connect academia, governments, industries and civil societies in the Asia Pacific Region. The objectives are:

- Tapping into digital technologies to find inclusive and sustainable solutions for regional and global challenges
- Promoting responsible conduct of research
- Removing barriers for free flow of knowledge by enabling preservation, accessibility and reusability of data.

12th APEC Meeting on Policy Partnership for STI // 12-1 August 2018 // Papua New Guinea

- View the photo gallery.
- Read our coverage of the event.

The Global Voice of Natural and Social Sciences

2018 marked a significant milestone for the Regional Office with the merger of the International Council for Science (ICSU) and the International Social Science Council (ISSC) to form the International Science Council (ISC). The launch was made official during the founding General Assembly held in Paris to commemorate the historical event. The ISC's main vision is to be the global voice of both natural and social sciences. Going forward, programmes would be designed to incorporate input from natural and social sciences, in addressing the SDGs.

Disaster risk reduction and urban health continues to be a priority area for the Regional Office for Asia and the Pacific (ROAP). ROAP maintained its close collaboration with IRDR ICoE-Taipei, having organised three Advanced Institutes in the area of slow-onset climate disasters, landslide risk reduction, and earthquake hazards. Seed grant funding is also made available for participants of the AI, aimed at strengthening multi-disciplinary research in disaster risk reduction, and promoting collaboration between countries in the region.

In urban health and wellbeing, ROAP's Science Planning Group on Epigenetics produced a Science Plan on the Impact on Health and Well-Being as a Consequence of Rapid Urbanisation in the Asia-Pacific Region: the Role of Epigenetics. The Science Plan aims to develop a regional capacity to address the impact of epigenetic changes resulting from rapid urbanisation on human health.

In achieving greater impact in the region, ROAP needs to be engaged with other regional organisations and institutions. Through a visit to UNESCAP and UNISDR in Bangkok, several synergies were explored. ROAP organised a meeting during the DBAR Conference that was held in Tengchong, China.

ROAP also co-sponsored a workshop on the Status of Climate Science and Technology in Asia, together with the IPCC and the Asian Network on Climate Science and Technology (ANCST). The workshop brought together scientists working on Asian issues to share current knowledge and technology on climate change, disaster risk reduction and their interactions with sustainable development.

10 Years and Beyond

International Science, Technology and Innovation Centre for South-South Cooperation under the Auspices of UNESCO (ISTIC) as a UNESCO category II Centre continued to execute programmes in meeting its objective and agenda mainly as an international platform for South-South cooperation in STI. In 2018, ISTIC:

- implemented **9** capacity building programmes
  - **357** participants from **47** countries
- Collaborated with **31** organisations
- Added two strategic partners through MOU: Forum of Small Medium Economics AFRICA ASEAN (FORSEAA) and United Nations Office for South-South Cooperation (UNOSSC)

Celebrating 10 years of excellence in STI, ISTIC has successfully organised International Conference on Climate Change Education, which brought together 127 delegates of subject matter experts, policy makers, government officers, and academia from 20 countries.

The two-day conference was divided into four plenary sessions, where experts discussed the effective mechanism on how to integrate climate change education in the curriculum, identify learning resources and good practices that will enhance climate change education, and seek support for teacher training on climate change education based on Inquiry Based Science Education (IBSE).

Recognising the urgent act needed to address the challenges in climate change education, a document highlighting recommendations and action plans on the importance of climate change education was formulated.

Critical recommendations outlined are:

- Climate change education must be integrated across school curricula and IBSE, which promotes analytical and critical thinking, should be adopted as the teaching approach.
- Industries need to be involved in promoting awareness and provide inputs for best practices.
- Follow-up events on this topic must be initiated by ISTIC in collaboration with stakeholders befitting its role as an international platform for south-south cooperation.

International Conference on Climate Change Education // 7-8 May 2018

NETWORK OF IDEAS

GATHERING OF BRILLIANT MINDS

In the era of knowledge and information, the hottest accessory one can wear is their ideas. With the emergence of the Internet, the art of in-person discussion is not yet lost. The gathering of scientific experts facilitates knowledge sharing, learning, networking, and content creation. ASM continues its track record from previous years in providing quality scientific output that benefits everyone.

SUSTAINABILITY SCIENCE:
THE WORLD WE WANT FOR ALL

Modernisation brings economic and technological advancement that enables improvement in the standard of living. As humanity progresses, environment pays the price of irreversible damage such as depletion of natural resources, climate change and extinction of species. In realising this, we must take proactive actions towards safeguarding our planet and her sustainability.

ASM strives to bring in forward-looking sustainability science into policy-making by concentrating on local challenges, while keeping in mind, regional and global perspectives. ASM embarked several studies that investigated the current environmental issues and the possible future. Nevertheless, the future of our planet will liaise on the hands of youths. What kind of future can today's young people look forward to?

The 11th General Assembly (GA) was organised by ASM to bring together experts to present their thoughts on the role of sustainability science in shaping the future of Malaysia, as well as addressing gaps and challenges in realising a preferred future.

The 11th GA commenced with a scene-setting presentation that elaborated on the importance of cybersecurity in today's hyper-connected and -globalised world, as well as the preparedness of Malaysia in addressing these threats and challenges.

A forum discussion followed the scene-setting, with a panel comprising prominent ASM Fellows that holistically addressed the issue of sustainability sciences from various points of view.

11th ASM General Assembly // 28 April 2018

The audience was also engaged to provide their views throughout the General Assembly. Through the Menti website, the audience were able to provide their feedback on what they think constitutes sustainability; what they think are the important roles of scientists in the pursuit of sustainability; and what they want to see in the ideal world that they would like to live in.

• View the photo gallery. • Read our coverage of the event.

ASM ideaXchange

together we make a difference

Getting together to exchange ideas and disseminate knowledge is a long-standing tradition among scientific communities. ASM is no exception to this tradition. First organised in 2011, ASM IdeaXchange session is a platform for the scientific community and ASM members to exchange ideas, discuss interdisciplinary matters, and debate on topical issues pertaining to STI.

28TH IDEAXCHANGE: STI MASTER PLAN

The IdeaXchange served to share the findings and impressions that have been collected throughout five regional Strategic Stakeholder Consultation Workshops on the STI Master Plan (STIMP) Study (2020 -2030). Audience's feedback was obtained regarding their initial thoughts on the sectoral objectives, framework, thematic areas, thrusts, strategies, goals and action plans. These constructive feedbacks will be used to pave the way forward for improvisation.

8 March 2018

ASM was appointed by MOSTI to undertake the study on preparing STIMP 2020-2030, following a decision of the National Science Council in December 2016.

View the photo gallery.

29TH ASM IDEAXCHANGE: NPSTI STUDY

Attended by an audience that comprises ASM Fellows, representatives from higher learning institutions, government and industry players, the IdeaXchange served as a session for the Study team to present the findings of the NPSTI 2021-2030 Study to obtain feedback on the proposed policy framework.

Responses from the audience were collated in regard to the Study as well as feedback and recommendations for each of the strategic thrusts, strategies, policy measures, indicators and targets. Relevant input obtained from this session will be incorporated in the NPSTI 2021-2030 Formulation Study Report.

1 August 2018

The policy framework draft retains the six strategic thrusts from the previous policy and put forward 27 strategies that need to be taken into consideration in building Malaysia's STI capacity and capability, beyond 2020.

View the photo gallery.

30TH ASM IDEAXCHANGE: ALTERNATIVE COMMODITY EXPORT FOR MALAYSIA

In order to remain competitive in today's world, Malaysia needs to diversify its agricultural commodities and its applications in order to drive progressive agriculture-based industry in the country. This echoes YAB Prime Minister Tun Dr Mahathir Mohamad's statement that called for more research and development into agricultural commodities. On that note, ASM organised an IdeaXchange titled Alternative Commodity Export for Malaysia.

The IdeaXchange session started off with an overview of the plantation industries and commodities industries in Malaysia by Mr Othman Asmaon from the Ministry of Primary Industries Malaysia. He focused on the performance of existing plantation commodities such as oil palm, rubber, timber, cocoa, pepper and kenaf.

Following his presentation, Datuk Dr Abdul Rahim Nik FASc moderated the discussion on alternative commodity export for Malaysia.

8 October 2018

Malaysia is the largest exporter of rubber gloves, and the second largest exporter of palm oil and fat in the world.

View the photo gallery.

FELLOWS' LECTURES

AFFORDABLE ≠ BAD

Typical affordable housing has always been associated with low-quality, poor sustainability and adaptability. D3 was introduced to debunk the idea with an integrated solution for affordable housing that intelligently combines modern STI principles with the old-world sensibilities of a "Kampung" house.

D3 aims to produce higher quality homes via an innovative design and construction method that creates value on a massive scale. Furthermore, D3 adopts a higher Industrial Building System (IBS) content in line with the National Construction Industry Roadmap to enhance construction time, quality and cost. In all, D3 is beneficial to the occupants, developers as well as the construction industry.

Ir Dr Zuhairi Abd Hamid FASc // Engineering Sciences

ARE GUT WORMS ALWAYS HARMFUL?

What if we tell you that gut worms are not as terrible as they sound?

Although they are mostly harmful, gut worms are actually beneficial in some ways. Studies showed the protective effects of gut worms that seek to preserve its own health by keeping its host healthy, on which it depends on for sustenance. In essence, a synergistic effect was found between the prevalence of gut worms with increased gut microbiota and improved immune system. Through various research and cooperative efforts with organisations, various communities have benefitted from the elimination of gut worms, notably disadvantaged ones such as the Orang Asli.

Professor Dr Yvonne Lim Ai Lian FASc // Medical and Health Sciences

PALM OIL: AN ALTERNATIVE

Renewable vegetable oils such as palm oil have the potential as industrial feedstock with a broad spectrum of applications, which contribute to an effective reduction of greenhouse gas emissions. Its more readily available compared to petrochemicals, which are non-sustainable and diminishing in supply. Though not a polymer, suitable chemical reactions upon palm oil can produce intermediates with different functional groups that could interact with other monomers, to form materials with interesting properties and applications.

Dr Gan Seng Neon FASc // Chemical Sciences

NOBELIST MINDSET

The Nobelist mindset can be institutionalised to build capacity and nurture current and future researchers, scientists, engineers (RSE) and technologists for Malaysia 2030. But what does it take for one to adopt the Nobelist mindset?

One must ponder upon three reflections: "Who We Are", "Where We Have Been", and "What Do We Need To Do". Individuals, institutions, business enterprises and the government stand to benefit greatly from the institutionalisation of the Nobelist mindset.

Dr Zainal Ariffin Ahmad FASc // Social Sciences and Humanities

MITIGATING MATERNAL MORTALITY

Over the years, Malaysia has successfully reduced maternal mortality through several efforts including auditing maternal deaths by the Confidential Enquiry into Maternal Deaths (CEMD).

CEMD practices active capture of maternal deaths to improve reporting. Working closely with the Department of Registration as well as being non-punitive and anonymous encourage better data yield. Additionally, CEMD could greatly impact existing policies as well as assist in formulating new ones.

Professor Dato' Dr Ravindran Jegasothy FASc // Medical and Health Sciences

ACCELERATED CONNECTIVITY

5G possesses ultra-low latency, high availability, high reliability, and strong security features, which enables it to be utilised in mission-critical services. Its low cost, ultra-low energy capabilities could be advantageous towards expanding the IoT.

To capitalise on 5G and its benefits, the National Fiberisation and Connectivity Plan (NFCP) was developed in response to the urgent need to improve broadband quality and coverage, reduce broadband prices, enable Internet access for all, and expand existing fibre networks.

Professor Dr Tharek Abd Rahman FASc // Information Technology and Computer Sciences

HYPER-CONVERGENT ECONOMY

The world economy is fast becoming hyper-converged, reliant on smart systems and algorithms that generate new information, ideas and innovation fuelled by data and machine learning.

Economic drivers are slowly moving away from the traditional land, labour and capital, towards embedded systems, intelligent algorithms and autonomous systems, forming knowledge networks. A robust technology ecosystem equipped with capital and talent investment, the ten pillars of network readiness, as well as dynamic capabilities would yield significant socio-economic impact.

Professor Dr Mahendhiran Sanggaran Nair FASc // Social Sciences and Humanities

• View the photo gallery. • Read our coverage of the event.

RECOGNITION FOR MALAYSIA'S BRILLIANT MINDS

Conferment of Fellowship of ASM and the Announcement of the Top Research Scientists Malaysia has become a staple on our calendar throughout the year. This year, we have the utmost honour of having the Prime Minister of Malaysia, YAB Tun Dr Mahathir Mohamad, to officiate the prestigious ceremony.

The ceremony witnessed the announcement of 24 recipients of the 2018 TRSM, presented by YB Puan Isnaraissah Munirah Majilis, Deputy Minister of MESTECC. Since its inception in 2010, TRSM is open to researchers nationwide and the number of recipients has now grown to a total of 157.

29 new Fellows were conferred, making the total number to 352 Fellows from eight discipline groups. The lifetime recognition allows them to carry the title "FASc" after their name. This is truly an important moment of appreciation and recognition of their remarkable efforts and stellar performance in their respective fields.

On the other hand, a Fellow who has exhibited exemplary individual contributions and outstanding leadership both locally and globally will be recognised as a Senior Fellow. Once they have been appointed, the title "Academician" precedes their name, as how their reputation precedes them.

This year, YM Academician Datuk Dr Tengku Mohd Azzman Shariffadeen FASc was appointed as Senior Fellow for his remarkable performance in the national and international ICT field and his role as a strategist in the development of national policies.

2018 Conferment of Fellowship of the Academy of Sciences Malaysia and the Announcement of the 2018 Top Research Scientists Malaysia // 1 November 2018

- Download the 2018 Edition of the ASM Expert Network.
- View the photo/video gallery.
- Read our coverage of the event.

THE ROLE OF STI AND INNOVATION IS CRUCIAL TO DRIVE ECONOMIC ADVANCEMENT AND SOCIETAL PROGRESS; THE NATION'S ECONOMY STANDS TO BENEFIT FROM ENTERPRISES THAT LEVERAGE ON S&T. HENCE, (ENTERPRISES) NEED TO STEP UP TO ENSURE MALAYSIA'S DYNAMIC GROWTH.

YAB TUN DR MAHATHIR MOHAMAD
PRIME MINISTER OF MALAYSIA

YAB Tun Dr Mahathir Mohamad flanked by YB Puan Isnaraissah Munirah Majilis and Professsor Datuk Dr Asma Ismail FASc at the Conferment of Fellowship of ASM and the Announcement of the Top Research Scientists Malaysia.

IN MEMORIAM

TAN SRI DATUK SERI LAW HIENG DING

17 NOVEMBER 1936 - 25 DECEMBER 2018

PASSIONATE TO ADVANCE THE COUNTRY'S S&T AGENDA THROUGH PUBLIC SERVICE

Tan Sri Datuk Seri Law Hieng Ding graduated from Nanyang University in 1960 with a Bachelor's Degree of Commerce in Accountancy and Banking.

His dedication in serving the people and improving their lives was evident through his contributions to the community as a public servant. Tan Sri Law joined the Sarawak United People's Party (SUPP) in the 1960s and was elected as one of the councillors for Sibu Urban District Council from 1964 to 1981. He also served as the Chairman of Sibu Urban District Council from 1978 to 1981.

From 1976 to 1987, he served as the Parliament Secretary under two ministries in Malaysia, namely, the Ministry of Housing and Local Government in 1976 and then the Ministry of Science, Technology and Environment (MOSTE) from 1976 to 1987. He was elected as Member of Parliament for the constituency of Sarikei in 1982, a position which he held for six consecutive terms. Subsequently, he was appointed as Federal Deputy Minister of MOSTE where he served for two terms from 1987 to 1990, after which he was appointed as the Minister of MOSTE from 1990 to 2004.

He was the Deputy President of Sarawak United People's Party (SUPP) and Nantah Education & Research Foundation as well as chairman and director of several public companies and foundations. He continued to serve in the interests of the Sarawak state and its people even after he stepped down as an MP in 2004.

Tan Sri Law also authored several books, such as Environmental Governance in Malaysia: Insights and Reflections, which was published in 2003 as well as his own biography titled In Pursuit of Integrity and Justice published in 2012.

His contributions to the state and country have been acknowledged with titles bestowed upon by state and federal governments. The Malaysian government bestowed the Commander of the Order of Loyalty to the Crown of Malaysia (PSM), earning him the title of Tan Sri in 2005; the Commander of the Order of the Defender of State (DGPN) was given to him by the Penang state government, earning him the title of Datuk Seri in 2001 Penang; and he earned the title Dato' Sri in 1992 from Sarawak by being awarded the Knight Commander of the Order of the Star of Sarawak (PNBS).

In view of his invaluable contribution to the development of S&T, he was elected as ASM Honorary Fellow in 2011.

DR YAP THOO CHAI FASc

1 NOVEMBER 1940 - 24 OCTOBER 2018

A RENOWNED PLANT BREEDER AND A PASSIONATE EDUCATOR

Dr Yap Thoo Chai FASc began his tertiary education with a Bachelor's Degree from Department of Agronomy, National Taiwan University, continuing with a Master's Degree and PhD from the Department of Crop Science, University of Saskatchewan.

As a lecturer, Dr Yap shared his knowledge of plants in the Faculty of Agriculture, UM from 1971-1975. He later became a Professor in plant breeding at UPM in 1976. After his retirement in 1996, he continued to be active in education and research, teaching at various learning institutions. He was elected as an ASM Fellow in 2008, under the Biological, Agricultural and Environmental Sciences discpline.

His interests in crop breeding, quantitative genetics and biometrics brought him to work as a part-time research assistant in the Statistics and Experimental Design Laboratory, Department of Agronomy, National Taiwan University. He was also a research assistant at the Crop Science Department at the University of Saskatchewan. Subsequently, he did a sabbatical research on genotype x environment interaction at University of Western Australia and on computer simulation of plant breeding research at the Institute of Genetics Mishima, Japan. He carried out research on oil palm breeding at PORIM, and later was appointed as a Technical Advisor to PORIM from 1982 to 1995.

Throughout his lifetime, he published over 100 scientific papers in local and international scientific journals. The first edition of his book on plant breeding titled *Prinsip-Prinsip Pembaikbiakan Tanaman* was published in 1985, followed by a second edition in 1990. He also released three varieties of vegetables for commercial production, namely *Chinta* sweet corn, *Bakti* super sweet corn, and the Line 30 variety of long beans.

Dr Yap also sowed the seeds of his knowledge serving as business consultants in agricultural projects of several private companies. His leadership qualities shone through his terms as President of the Malaysian Scientific Association (1992-1996) and President of the Malaysian Senior Scientists Association (2009-2011). He also served dutifully as a Regional Secretary and Board Member of the Society for the Advancement of Breeding Research in Asia and Oceania (SABRAO) from 1989 to 2000.

Dr Yap will be dearly missed and remembered by family, friends, colleagues and acquaintances.

EMERITUS PROFESSOR DR CHIN HOONG-FONG FASc

FEBRUARY 1935 - 19 MARCH 2018

A LIFETIME PERSUANCE OF KNOWLEDGE IN SEED SCIENCE

Emeritus Professor Dr Chin Hoong-Fong FASc participated in the Science Society at the Methodist Boys School. This sowed the seed of his interest in agriculture. He continued his studies at the University High School in Melbourne, and then took up agricultural science in the University of Melbourne, graduating with a Bachelor of Agricultural Science in 1960.

Dr Chin worked in UPM from 1960 to 2018, serving the last 23 years on voluntary basis. While working, he obtained his Master's Degree and PhD in Agricultural Science from the University of Melbourne. He was appointed as an Associate Professor in 1975, Professor in 1981 and Professor Emeritus in 1996 by UPM. In recognition of his contributions to the University of Melbourne and international agriculture, he was awarded the Honorary Degree of Doctor of Agricultural Science by University of Melbourne in 1994. It was a moment of pride and joy for Dr Chin to obtain four degrees in the same discipline from the same university, which was very rare.

Dr Chin's expertise lies in the discovery of storage and conservation of recalcitrant species. He devoted his life in developing various methods of seed storage and the cryopreservation of plant genetic resources. His lifelong pursuit of knowledge was guided mainly by his belief in searching, sharing and saving. He believed that searching for knowledge is a lifelong pursuit; sharing knowledge is akin to sowing seeds so it could grow and propagate, and he believed in saving the legacy of plant genetic resources via seed storage.

Dr Chin was a prolific writer, having written and edited 13 books on topics related to seed conservation, horticulture and general agriculture. In addition to academic writing, he also exhibited his love for nature through other creative pursuits. Aside from gardening and photography, he channelled his passion for plants and people through beautifully-crafted poetry.

Dr Chin first initiated the National Seed Symposium in 1976. With this, the seeds for the establishment of a National Seed Association Malaysia (NSAM) in 2008 were sown. NSAM plays a very important role in Malaysian agriculture by providing input on seeds and planting material.

For his long service and contribution, he received the Johan Setia Mahkota (JSM) from the Yang Dipertuan Agong in 1990. Dr Chin was appointed as Foundation Fellow of ASM in 1995 under the Biological, Agricultural and Environmental Sciences discipline. His involvement in ASM was seen in his participation in the ASM Biodiversity Committee (2001-2002) and the ASM Publication Committee (2001-2002).

ACADEMICIAN DR CHIA SWEE PING FASc

12 NOVEMBER 1945 - 8 MARCH 2018

THE BRIGHTEST STAR IN MALAYSIAN PHYSICS COMMUNITY

Dr Chia Swee Ping FASc graduated from UM with a Bachelor of Science (Honours) in 1967. Following that, he graduated from the University of Illinois with a Masters of Science in 1968 and PhD in 1972. He was awarded Fulbright Hayes scholarship by the United States Government in 1967.

Dr Chia contributed to the education field working as a lecturer at UM from 1972 to 1980. Following that, he became an Associate Professor in 1980, and then a Professor in 1992. Following his tenure at UM, Dr Chia extended his experience and expertise to INTI International University College, working at the Subang Jaya branch as an Academic Advisor from 1987 to 1999; he then relocated to the Nilai branch to become the Vice-President of Academic Affairs from 1999 to 2006.

Dr Chia worked as a Director of Research (Science and Technical) at the Huazi Resource and Research Center in Kuala Lumpur between 1987 and 2000. He spent several years abroad, honing his skills and expertise in the field as a visiting scientist at the International Center for Theoretical Physics and Center for Particle Theory at the University of Texas. He was a Visiting Expert and Scientist at the Institute of Physics, Academia Sinica, Taiwan for two times, in 1983 and then in 1995. Dr Chia was also a Visiting Professor at the University of Paris in 1996.

Harnessing his knowledge in the field, Dr Chia worked as an Assistant Editor at the Malaysian Journal of Science from 1977 to 1985. In addition, he was an Editor at Jurnal Fizik Malaysia since 1984. From 1991 to 1994, he was the Chairman of the Association of Southeast Asian Nations at the Institute of Physics and served as the Vice-President since 1995. From 1978 to 1982, he was a Treasurer at the Southeast Asia Theoretical Physics Association. Since 2000, he was a Council Member of the Association of Asia-Pacific Physical Societies and since 2005.

He was a member of Asian Committee Future Accelerator in 1975. He also served as a Fellow of the Malaysian Institute of Physics, Institute Physics United Kingdom, Association of Southeast Asian Nations Institute of Physics, International Centre of Theoretical Physics and the Southeast Asia Theoretical Physics Association.

He was selected as ASM Fellow in 1997 under the Mathematics, Physics and Earth Sciences discipline. In 2013 he was appointed as ASM Senior Fellow.

Dr Chia spent his free time practicing Tai-ji, playing bridge, chess, and Chinese chess to sharpen his mind and strengthen his body.

Dr Chia will forever be loved and missed by his family, friends, and acquaintances.

FINANCIAL STATEMENTS

ASM's financial statements provide a bird's eye view of its financial results, performance and cash flow.

ASM Financial Overview

The 2018 ASM Financial Statements is prepared according to the Malaysia Public Sector Accounting Standard (MPSAS). The adoption of this standard aims to strengthen public finance management for better informed assessments of the resource allocation decisions made by governments, thereby increasing transparency and accountability.

For the year ended 31 December 2018, ASM Financial Performance has shown a financial surplus of RM2,776,823 (2017: RM1,249,892). ASM Financial Position was strengthened in 2018 as the total net assets was recorded at RM6,635,502 (2017:RM2,799,790). The increase in net assets was due to decrease of total ASM liabilities compared to 2017, giving significant impact for the year of 2018. The liabilities includes the gain on investment of R,D&C fixed deposit. With approval from MOF, ASM were allowed to use RM4.5mil from this fund to support operational cost.

- **OPEX** 11,521,000
- **DEVELOPMENT GRANT** 4,345,204
- **AMORTIZATION OF DEFERRED GRANT** 9,245,765
- **OTHER INCOME** 1,328,055
- **INTEREST INCOME** 211,381

RM26,651,405

- **EMOLUMENT FOR CONTRACT STAFF, SERVICES & SUPPLIES** 6,545,803
- **CONTRIBUTION & FIXED CHARGES** 3,660,573
- **SCIENCE PROGRAMME EXPENSES** 12,450,496
- **OTHER EXPENSES** 246,333
- **EMPLOYEE BENEFITS** 329,794
- **EMOLUMENT FOR PERMANENT STAFF** 641,583

RM23,874,582

For the year 2018, ASM operational expenditure was RM9,317,292 whereas operational of ISTIC office was RM1,332,625 while ISC ROAP office was RM871,083. Malaysian Government contributed RM11,521,000 for operating expenditure, which is 43% contribution to ASM income. ASM also received external grants from various organisations amounting to RM4,345,204 contributing 16% to ASM income. Apart from this, ASM also records amortization of deferred grants (eg R,D&C fund) amounting to RM9,245,765. However, there were less new grants received from the Malaysian Government to ASM in the year 2018.

The investment of ASM funds in fixed deposits and Opus Shariah Cash Management generated gain on investment of RM211,381 which contributed 1% to ASM income. Other income recorded at RM1,328,055 (5%) are from receivables such as registration fees, programme management fee, rental and profit from disposal of asset. Thus, the overall income of ASM is recorded at RM26,651,405.

Furthermore, ASM expenditure in 2018 shows improvement by a 44% decrease amounting to RM23,874,582 compared to RM42,450,630 in 2017 where major disbursements were for R,D&C fund. The expenditures comprises emoluments for permanent staff of RM641,583 (3%), payments for contract staff, services and supplies amounting to RM6,545,803 (27%), science programme expenses RM12,450,496 (52%), contribution and fixed charges of RM3,660,573 (15%). Other expenses of RM576,127 (2%) consists of payments related to employee benefit, other expenses and depreciation of property, plant and equipment.

LAPORAN KETUA AUDIT NEGARA
MENGENAI PENYATA KEWANGAN
AKADEMI SAINS MALAYSIA
BAGI TAHUN BERAKHIR 31 DISEMBER 2018

Laporan Mengenai Penyata Kewangan

Pendapat Berteguran

Penyata Kewangan Akademi Sains Malaysia telah diaudit oleh wakil saya yang merangkumi Penyata Kedudukan Pada 31 Disember 2018 dan Penyata Prestasi Kewangan, Penyata Perubahan Dalam Aset Bersih, Penyata Aliran Tunai serta Penyata Perbandingan Bajet dan Sebenar bagi tahun berakhir pada tarikh tersebut, ringkasan polisi perakaunan yang signifikan dan nota kepada penyata kewangan seperti dinyatakan pada muka surat 3 hingga 19.

Pada pendapat saya, penyata kewangan ini memberikan gambaran yang benar dan saksama mengenai kedudukan kewangan Akademi Sains Malaysia pada 31 Disember 2018 dan prestasi kewangan serta aliran tunai bagi tahun berakhir pada tarikh tersebut selaras dengan Piawaian Perakaunan Sektor Awam Malaysia (MPSAS) dan Akta Akademi Sains Malaysia 1994 (Akta 524) kecuali perkara yang dinyatakan di perenggan Asas Kepada Pendapat Berteguran.

Asas Kepada Pendapat Berteguran

i. **Pelunasan Hasil – RM1,483,900**
Perbezaan antara pelunasan di Penyata Pendapatan dengan perbelanjaan program sejumlah RM1.48 juta bagi program *DSTIN Flagship, Newton Ungku Omar Fund (NUOF), NPSTI, Science Outlook, MOSTI Social Innovation (MSI)*-Duta Sains, *STI Master Plan, ICSU ROAP* dan *ISTIC*.

ii. **Kumpulan Wang Projek – RM1,906,813**
Baki Kumpulan Wang Projek di Aset Bersih/Ekuiti sejumlah RM1.9 juta bagi projek RMK-8, RMK-9, RMK-10 dan aktiviti Program Sains, Teknologi dan Inovasi tidak direkodkan sebagai Liabiliti selaras dengan MPSAS 23, Hasil daripada Urus Niaga Bukan Pertukaran (Cukai dan Pindahan).

Pengauditan telah dilaksana berdasarkan Akta Audit 1957 dan *The International Standards of Supreme Audit Institutions*. Tanggungjawab saya dihuraikan selanjutnya di perenggan Tanggungjawab Juruaudit Terhadap Pengauditan Penyata Kewangan dalam laporan ini. Saya percaya bahawa bukti audit yang diperoleh adalah mencukupi dan bersesuaian untuk dijadikan asas kepada pendapat berteguran saya.

Kebebasan dan Tanggungjawab Etika Lain

Saya adalah bebas daripada Akademi Sains Malaysia dan telah memenuhi tanggungjawab etika lain berdasarkan *The International Standards of Supreme Audit Institutions*.

Maklumat Lain Selain Daripada Penyata Kewangan dan Laporan Juruaudit Mengenainya

Majlis Akademi Sains Malaysia bertanggungjawab terhadap maklumat lain dalam Laporan Tahunan. Pendapat saya terhadap penyata kewangan Akademi Sains Malaysia tidak meliputi maklumat lain selain daripada Penyata Kewangan dan Laporan Juruaudit mengenainya dan saya tidak menyatakan sebarang bentuk kesimpulan jaminan mengenainya.

Tanggungjawab Majlis Terhadap Penyata Kewangan

Majlis bertanggungjawab terhadap penyediaan penyata kewangan Akademi Sains Malaysia yang memberi gambaran benar dan saksama selaras dengan Piawaian Perakaunan Sektor Awam Malaysia (MPSAS) dan Akta Akademi Sains Malaysia 1994 (Akta 524). Majlis juga bertanggungjawab terhadap penetapan kawalan dalaman yang perlu bagi membolehkan penyediaan penyata kewangan Akademi Sains Malaysia yang bebas daripada salah nyata yang ketara sama ada disebabkan fraud atau kesilapan.

Semasa penyediaan penyata kewangan Akademi Sains Malaysia, Majlis bertanggungjawab untuk menilai keupayaan Akademi Sains Malaysia untuk beroperasi sebagai satu usaha berterusan, mendedahkannya jika berkaitan serta menggunakannya sebagai asas perakaunan untuk usaha berterusan.

Tanggungjawab Juruaudit Terhadap Pengauditan Penyata Kewangan

Objektif saya adalah untuk memperoleh keyakinan yang munasabah sama ada penyata kewangan Akademi Sains Malaysia secara keseluruhannya adalah bebas daripada salah nyata yang ketara, sama ada disebabkan fraud atau kesilapan, dan mengeluarkan Laporan Juruaudit yang merangkumi pendapat saya. Jaminan yang munasabah adalah satu tahap jaminan yang tinggi, tetapi bukan satu jaminan bahawa audit yang dijalankan mengikut *The International Standards of Supreme Audit Institutions* akan sentiasa mengesan salah nyata yang ketara apabila ia wujud. Salah nyata boleh wujud daripada fraud atau kesilapan dan dianggap ketara sama ada secara individu atau agregat sekiranya boleh dijangkakan dengan munasabah untuk mempengaruhi keputusan ekonomi yang dibuat oleh pengguna berdasarkan penyata kewangan ini.

Sebagai sebahagian daripada pengauditan mengikut *The International Standards of Supreme Audit Institutions*, saya menggunakan pertimbangan profesional dan mengekalkan keraguan profesional sepanjang pengauditan. Saya juga:

a. Mengenal pasti dan menilai risiko salah nyata ketara dalam penyata kewangan Akademi Sains Malaysia, sama ada disebabkan fraud atau kesilapan, merangka dan melaksanakan prosedur audit yang responsif terhadap risiko berkenaan serta mendapatkan bukti audit yang mencukupi dan bersesuaian untuk memberikan asas kepada pendapat saya. Risiko untuk tidak mengesan salah nyata ketara akibat daripada fraud adalah lebih tinggi daripada kesilapan kerana fraud mungkin melibatkan pakatan, pemalsuan, ketinggalan yang disengajakan, representasi yang salah, atau mengatasi kawalan dalaman.

b. Memahami kawalan dalaman yang relevan untuk merangka prosedur audit yang bersesuaian tetapi bukan untuk menyatakan pendapat mengenai keberkesanan kawalan dalaman Akademi Sains Malaysia.

c. Menilai kesesuaian dasar perakaunan yang diguna pakai dan kemunasabahan anggaran perakaunan dan pendedahan yang berkaitan oleh Majlis.

d. Membuat kesimpulan terhadap kesesuaian penggunaan asas perakaunan untuk usaha berterusan oleh Majlis dan berdasarkan bukti audit yang diperoleh, sama ada wujudnya ketidakpastian ketara yang berkaitan dengan peristiwa atau keadaan yang mungkin menimbulkan keraguan yang signifikan terhadap keupayaan Akademi Sains Malaysia sebagai satu usaha berterusan. Jika saya membuat kesimpulan bahawa ketidakpastian ketara wujud, saya perlu melaporkan dalam Laporan Juruaudit terhadap pendedahan yang berkaitan dalam penyata kewangan Akademi Sains Malaysia atau, jika pendedahan tersebut tidak mencukupi, pendapat saya akan diubah. Kesimpulan saya dibuat berdasarkan bukti audit yang diperoleh sehingga tarikh Laporan Juruaudit.

e. Menilai sama ada keseluruhan persembahan termasuk pendedahan penyata kewangan Akademi Sains Malaysia memberi gambaran yang saksama.

Saya telah berkomunikasi dengan Majlis, antaranya mengenai skop dan tempoh pengauditan yang dirancang serta penemuan audit yang signifikan, termasuk kelemahan kawalan dalaman yang dikenal pasti semasa pengauditan.

Laporan Mengenai Keperluan Perundangan dan Peraturan Lain

Berdasarkan keperluan Akta Akademi Sains Malaysia 1994 (Akta 524), saya juga melaporkan bahawa pada pendapat saya, rekod perakaunan dan rekod lain yang berkaitan telah diselenggara dengan teratur oleh Akademi Sains Malaysia kecuali perkara yang dinyatakan di perenggan Asas Kepada Pendapat Berteguran.

Hal-hal Lain

Laporan ini dibuat untuk Majlis dan bukan untuk tujuan lain. Saya tidak bertanggungjawab terhadap pihak lain bagi kandungan laporan ini.

(MOHD NASRI BIN MOHD NASIR)
b.p. KETUA AUDIT NEGARA
MALAYSIA

PUTRAJAYA
8 APRIL 2019

Academy of Sciences Malaysia

PENYATA PRESIDEN DAN BENDAHARI KEHORMAT
AKADEMI SAINS MALAYSIA

Kami, **PROFESSOR DATUK DR. ASMA BINTI ISMAIL F.A.Sc** dan **DATUK DR. ABDUL RAZAK BIN MOHD ALI F.A.Sc,** yang masing-masing merupakan Presiden dan Bendahari Kehormat AKADEMI SAINS MALAYSIA (ASM) dan juga Ahli-Ahli Majlis, dengan ini menyatakan bahawa, pada pendapat Majlis ASM, Penyata Kedudukan Kewangan, Penyata Prestasi Kewangan, Penyata Perubahan Aset Bersih, Penyata Aliran Tunai dan Penyata Perbandingan Bajet dan Sebenar ASM berserta dengan nota-nota didalamnya adalah disediakan mengikut Piawaian Perakaunan Sektor Awam Malaysia bagi memberikan pandangan yang benar dan saksama mengenai kedudukan kewangan ASM pada 31 Disember 2018 dan hasil kedalliannya serta perubahan kedudukan kewangan bagi tempoh yang berakhir pada tarikh tersebut.

Bagi pihak Majlis

PROFESSOR DATUK DR. ASMA BINTI ISMAIL F.A.Sc
Presiden
Akademi Sains Malaysia

Bagi pihak Majlis

DATUK DR. ABDUL RAZAK BIN MOHD ALI F.A.Sc
Bendahari Kehormat
Akademi Sains Malaysia

KUALA LUMPUR, MALAYSIA
Tarikh : 29 JAN 2019

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PENGAKUAN OLEH KETUA PEGAWAI EKSEKUTIF KE ATAS PENGURUSAN KEWANGAN AKADEMI SAINS MALAYSIA

Saya, **HAZAMI BINTI HABIB**, No. K/P 660619-08-5516 pegawai utama yang bertanggungjawab ke atas pengurusan kewangan AKADEMI SAINS MALAYSIA (ASM), dengan ikhlasnya mengakui bahawa Penyata Kedudukan Kewangan, Penyata Prestasi Kewangan, Penyata Perubahan Aset Bersih, Penyata Aliran Tunai dan Penyata Perbandingan Bajet dan Sebenar ASM berserta dengan nota-nota didalamnya, mengikut sebaik-baik pengetahuan dan kepercayaan saya, adalah betul, dan saya membuat ikrar ini dengan sebenarnya mempercayai bahawa ianya adalah benar dan atas kehendak-kehendak Akta Akuan Berkanun 1960.

Sebenarnya dan sesungguhnya
diakui oleh penama di atas di
Kuala Lumpur, Malaysia

HAZAMI BINTI HABIB

Pada : 29 JAN 2019

Di hadapan saya,

PESURUHJAYA SUMPAH
W465
KAPT (B) JAINI BIN YUSOFF
1 JAN 2019 - 31 DIS 2023
MALAYSIA

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STATEMENT OF FINANCIAL POSITION
as at 31 December 2018

	Note	2018 RM	2017 RM *As Restated*
ASSETS			
Current Assets			
Cash and Cash Equivalents	3	53,451,178	57,528,367
Debtors	4	3,693,687	853,311
Other Current Assets	5	785,665	900,354
Total Current Assets		**57,930,530**	**59,282,032**
Non-current Assets			
Property, Plant and Equipment	6	395,570	376,716
Total Non-current Assets		**395,570**	**376,716**
TOTAL ASSETS		**58,326,100**	**59,658,748**
LIABILITIES			
Current Liablilities			
Creditors	7	4,836,324	7,980,691
Employee Benefits	8	329,794	240,689
Total Current Liabilities		**5,166,118**	**8,221,380**
Non-current Liabilities			
Deferred Grant	9	46,299,341	48,499,882
Employee Benefits	8	225,139	137,696
Total Non-current Liabilities		**46,524,480**	**48,637,578**
Total Liabilities		**51,690,598**	**56,858,958**
NET ASSETS		**6,635,502**	**2,799,790**
NET ASSETS/ EQUITY			
Operational Fund	10	4,428,897	1,652,074
Endowment Fund	11	245,202	171,856
Project Fund	12	1,906,813	920,240
Capital Reserve Fund	13	54,590	55,620
TOTAL NET ASSETS/ EQUITY		**6,635,502**	**2,799,790**

STATEMENT OF FINANCIAL PERFORMANCE
for the year ended 31 December 2018

	Note	2018 RM	2017 RM
INCOME			
Non-Exchangeable Transactions	14	25,111,969	42,811,772
Exchangeable Transactions	15	211,381	299,485
Other Income	16	1,328,055	589,265
TOTAL INCOME		**26,651,405**	**43,700,522**
EXPENSES			
Emoluments		641,583	602,760
Services and Supplies		6,545,803	6,197,905
Contribution and Fixed Charges		3,660,573	3,344,786
Employee Benefits	8	329,794	188,074
Other Expenses		86,652	282,643
Doubtful Debts		-	19,472
Science Programme Expenses		12,450,496	31,616,580
Depreciation of Property, Plant and Equipment	6	159,681	198,410
TOTAL EXPENSES		**23,874,582**	**42,450,630**
SURPLUS FOR THE YEAR		**2,776,823**	**1,249,892**

The acompanying notes from an integrated part of the Financial Statement

STATEMENT OF CHANGES IN NET ASSETS/ EQUITY

for the year ended 31 December 2018

	Operational Fund	Endowment Fund	Project Fund	Capital Reserve Fund	Total
	RM	RM	RM	RM	RM
Balance as at 01 January 2017 - As stated earlier	403,004	60,100	977,050	56,650	1,496,804
Income in 2017	-	111,756	-	-	111,756
Amortization of development grants	-	-	-	-	-
Lease payments	-	-	-	(1,030)	(1,030)
Deficit for the year	1,249,892	-	-	-	1,249,892
Expenses for 2017	-	-	(56,810)	-	(56,810)
Adjustment	(822)	-	-	-	(822)
Balance as at 31 December 2017 - As stated earlier	1,652,074	171,856	920,240	55,620	2,799,790
Adjustment	-	-	-	-	-
Balance as at 31 December 2017 - As stated earlier	1,652,074	171,856	920,240	55,620	2,799,790
Income in 2018	-	73,346	1,503,128	-	1,576,474
Lease payments	-	-	-	(1,030)	(1,030)
Surplus for the year	2,776,823	-	-	-	2,776,823
Expenses for 2018	-	-	(516,555)	-	(516,555)
Adjustment	-	-	-	-	-
Balance as at 31 December 2018	**4,428,897**	**245,202**	**1,906,813**	**54,590**	**6,635,502**

The acompanying notes from an integrated part of the Financial Statement

STATEMENTS OF CASH FLOWS

for the year ended 31 December 2018

	2018 RM	2017 RM
CASH FLOWS FROM OPERATING ACTIVITIES		
Surplus for the year	2,776,823	1,249,892
Adjustment:		
Depreciation of Property, Plant and Equipment	159,681	198,410
Interest from Short Term Deposits, Fixed Deposits and Investments	(211,381)	(299,485)
Adjustment from Property and Equipment Write off	2,391	-
Profit of Disposal	(2,395)	-
GST Adjustment	-	(5,053)
Fixed Deposit Interest Adjustment	-	4,231
Surplus before Changes of Working Capital	2,725,119	1,147,995
(Surplus)/ Deficit in Receivables	(2,725,687)	391,982
(Deficit)/ Surplus in Payables	(2,967,819)	(3,018,310)
Net Cash from Operating Activities	**(2,968,387)**	**(1,478,333)**
CASH FLOWS FROM INVESTMENT ACTIVITIES		
Income from Sale of Property, Plant and Equipment	2,419	-
Purchase of Property, Plant and Equipment	(180,950)	(24,884)
Interest Received	211,381	299,485
Net cash from Investment Activities	**32,850**	**274,601**
CASH FLOWS FROM FINANCING ACTIVITIES		
Project Fund	986,573	(56,810)
Capital Reserve Fund	(1,030)	(1,030)
Endowment Fund	73,346	111,756
Deferred Grant	(2,200,541)	(22,522,794)
Net Cash Used in Financing Activities	**(1,141,652)**	**(22,468,878)**
(DECREASE) IN CASH AND CASH EQUIVALENTS	**(4,077,189)**	**(23,672,610)**
CASH AND CASH EQUIVALENTS AT BEGINNING OF THE FINANCIAL YEAR	**57,528,367**	**81,200,977**
CASH AND CASH EQUIVALENTS AT THE END OF THE FINANCIAL YEAR	**53,451,178**	**57,528,367**
CASH AND CASH EQUIVALENTS		
Fixed Deposits	52,296,394	56,779,778
Cash and Bank Balances	1,154,784	748,589
	53,451,178	**57,528,367**

The acompanying notes from an integrated part of the Financial Statement

STATEMENTS OF COMPARISON BUDGET AND ACTUAL
for the year ended 31 December 2018

	Budget Amount		Actual Amount	Budget Variance
	Actual RM	Final RM	2018 RM	RM
RECEIPT				
Government Grant	7,021,000	11,521,000	11,521,000	-
Interest Income	-	-	211,381	211,381
External Contributions	5,041,805	6,244,313	5,026,826	(1,217,487)
Other Income	-	409,062	1,328,055	918,993
	12,062,805	**18,174,375**	**18,087,262**	**(87,113)**
PAYMENTS				
Emoluments	458,292	636,122	626,585	(9,537)
Services and Supplies	8,871,265	12,588,569	12,362,374	(226,194)
Assets	-	65,000	55,278	(9,722)
Contribution and Fixed Changes	2,722,748	4,584,857	2,348,420	(2,236,437)
Employee Benefits/ Rewards	-	-	-	-
Other Expenses	10,500	299,827	112,553	(187,274)
	12,062,805	**18,174,375**	**15,505,211**	**(2,669,164)**
NET RECEIVABLES/ (PAYMENT)	**-**	**-**	**2,582,051**	**2,582,051**

The acompanying notes from an integrated part of the Financial Statement

NOTES TO THE FINANCIAL STATEMENTS
for the year ended on 31 December 2018

1 GENERAL INFORMATION
a) Main Activity

ASM was established under the Act 524. The main objective of ASM is to pursue, encourage and enhance excellence in the fields of SET for the development of the nation and benefit of mankind.

b) This Financial Statements are presented in Malaysian Ringgit currency (MYR).

c) ASM Financial Statements for the year ended 31 December 2018 was presented and approved by ASM Council on 29 January 2019.

2 ACCOUNTING POLICIES
a) Basis of Preparation of Financial Statements

The Financial Statements of ASM is prepared under the conventional historical cost complying with the Malaysian Public Sector Accounting Standards (MPSAS) issued by the Accountant General's Department.

This Financial Statements is the third Financial Statements prepared based on MPSAS. ASM adopted MPSAS before the actual effective date as stated in Note 2(b) of the Financial Statements. Previously, ASM Financial Statements was prepared based on Public Entity Reporting Standards (PERS).

b) Early Adoption of MPSAS

ASM has adopted the following MPSAS for the Financial Statements for the year ended 31 December 2016. The actual effective date is:-.

		Effective date
MPSAS 1	- Presentation of Financial Statements	1 January 2017
MPSAS 2	- Cashflow Statements	1 January 2017
MPSAS 3	- Accounting policies, changes in accounting, estimates and errors	1 January 2017
MPSAS 17	- Property, Plant and Equipment Provisions	1 January 2017
MPSAS 19	- Contingent Liabilities and Contingent Assets	1 January 2017
MPSAS 20	- Related Party Disclosures	1 January 2017
MPSAS 24	- Presentation of Budget Information in Financial Statements	1 January 2017
MPSAS 25	- Employee Benefits	1 January 2017
MPSAS 30	- Financial Instruments: Disclosure	1 January 2017
MPSAS 33	- First-time Adoption of Accrual Basis MPSAS	1 January 2017

c) Income Recognition

Income from Non Exchangeable Business Transactions

Non exchangeable business transactions will be recognised as an asset when there is future economic benefits or potential services that is predicted to be channelled to the entity and it is a result from a historical event as well as the true value of asset can be exchanged reasonably. Non exchangeable business transactions recognised as asset shall be recognised as income except for liability that is also being recognised for the same transaction as delayed transaction in the Financial Statements. When the obligations towards liabilities are met, the entity shall reduce the liabilities amount and recognise the income amount as equivalent to the amount reduced.

i. Government Grants which are not subjected to a specific future performance terms such as the operating grant are recognised as income in the Financial Statements.
ii. Funding received for programmes/ projects with duration of less than a year is recognised as income within the same year. Whereas, funding for implementing development programme/ projects more than a year, the receivables will be debited into the respective Project Fund and the access of the receivable from the expenditures is recognised as income for the respective year when the project term or durations expires. Vice versa, if there is additional expenses beyond the amount received, then this amount shall be recognised as ASM expenses.
iii. Deferred Grant is access of income or allocation received after expenses made within the respective year, which is then, brought forward to the following year to bear the expenses of programme/project in the following year (programme /project with duration more than one financial year).

Income from Exchange Transactions

Income from exchange transactions are recognised when there are possibilities for future economy or potential services which may be channelled to the entity and the benefits can be measured and realised.

i. Income derived from interest and other investment
Income derived from fixed deposits is recognised based on current exchange rates taking into considerations of effective return of investment. The return of investment on asset is the profit rate required to discount the future incoming cash flow expectation throughout the life expectancy of the respective asset to be equalised with the brought forward value of the asset.

Income derived from interest gained from conventional deposit and investment are recognised on the accrual basis.

Other Revenue/ Income

i. Income from rental is recognised when it is received in accordance with the rental agreement.
ii. Other incomes are recognised when services are provided.

d) Property, Plant and Equipment
Property, Plant and Equipment are stated at a cost less than accumulated depreciation.

Depreciation for Property, Plant and Equipment are calculated based on a straight line basis over their accumulated useful life at the following rates:-

Land (leasehold)	According to lease period
Office Renovation	10%
Motor Vehicles	20%
Office Equipment	20%
Computers	20%

Lease land owned valuated at RM 61,800.00 was obtained on 21 June 2012 with lease period of 60 years and yearly payment of RM 1,030.00 is required to be paid on 7th January of each year.

Property, Plants and Equipment listed in the inventory are in good conditions with value of RM1,000 or more per unit.

Full depreciation is subjected on the same year of purchase of the Real Estate or equipment. Net balance of each Real Estate and equipment shall not be valued less than RM1.00.

e) Impairment of Property and Equipment
The net book value of ASM property and equipment is analysed on the date which account is prepared to determine the existence of impairment on the property and equipment. If there are evidences of impairment which could be recouped and the value is lesser than the net book value, then the net book value of the respective real estate or equipment will be reduced to the value which the property or equipment could be obtained again.

The amount (known as the impairment value of property and equipment) will be recorded as expenditure and in the profit and loss statement of the year.

f) Financial Instrument
Financial Instrument stated in the Financial Statements include fixed deposits, cash in hand and bank balances, debtors and creditors. The accepted financial instruments are stated in the Financial Statements accounting policies separately.

i. Receivables
Receivables are stated at estimated realisable value. Bad debts are written off when they are identified. Doubtful debts are provided for unpaid debts over a period of three years.

ii. Payables
Payables are stated at cost which is the fair value of the payments and services rendered.

iii. Objectives and Financial Risk Management Policies
The ASM objectives and Financial Risk Management Policies is to ensure sufficient or adequate financial resources to carry out its operational development, while managing its financial risks including credit risk, interest rate risk, non-performing loan risk, liquidity and cash flow risks.

iv. Credit Risks
ASM credit risks are from receivables. These accounts are monitored from time to time via existing internal procedures and actions are taken against outstanding debts.

v. Interest Rate Risks
ASM maintains a fixed cash and fixed deposits to meet working capital requirements. The risk exists due to fluctuations of interest rate in the market.

vi. Liquidity and Cash Flow Risks
ASM manages its payable and receivable transactions and collection of debts from clients that has reached the maturity period meticulously to maintain its liquidity and cash flow.

g) Cash and Cash Equivalents
Cash and Cash Equivalents comprise of cash in hand, bank balances and fixed deposits.

h) Employee Benefits
i. Short Term Employee Benefits
ASM as a Federal Statutory Body is governed by employment regulations set by the Public Service Department (PSD). The short-term employee benefits outlined by the PSD are basic salaries, fixed allowances, variable allowances, and various leaves including annual leave, medical benefits and insurance.

Wages, salaries, allowances and statutory contributions are recognised as expenditure of the year in which the services rendered by the respective ASM employee.

ii. Statutory Contribution Plan
ASM contributes to the Employees' Provident Fund (EPF) and the Employees' Retirement Fund for its employees in accordance with the scheme chosen. The contributions are recognised as expenditure in the Income Statements when incurred. ASM contributes 17.5% for pension scheme, 11% for Employees' Provident Fund (EPF) and 4% for Employees' Provident Fund (EPF) for employees of 60 years of age and above on a monthly basis.

The contributions are recognised as expenditure in the Income Statements when incurred.

i) Employee Long-Term Benefits
i. Permanent Employees
For ASM permanent employees, whether they choosed pension scheme or the EPF will receive a reimbursement for annual leave *(Gantian Cuti Rehat)* upon their retirement. This reward is based on the Service Circular issued by the Public Service Department and adopted by ASM.

Reimbursement of annual leave is calculated based on the following formula:

1/30 x number of leave up to a maximum of 150 days x salary + fixed final remuneration received (subject to maximum limit of 150 days).

ii. Contract Employees
ASM provides gratuity payment for contract employees. Gratuity is paid upon completion of employment contract satisfactory. The gratuity is one month salary (excluding the allowances) for each year of service. Gratuity is calculated based on the following formula:

Salary (excluding allowance) x month of service / 12

The maximum limit of reimbursement of annual leave for contract employees is six days.

In addition, ASM uses circulars relevant to employees' benefits or rewards which are adopted by ASM Council, including the Public Service circulars from time to time.

j) Taxation
ASM is exempted from income tax under Section 44 (6) of the Income Tax Act 1967, pursuant to a tax exemption letter dated 2 March 1996 from the Inland Revenue Board of Malaysia (LHDN) with LHDN's reference number 01/35/42/51/179-6.4357 obtained from Director General of Inland Revenue Board of Malaysia.

k) Goods and Services Tax (GST)
The implementation of Goods and Services Tax took effect on 1 April 2015. ASM registered with the Royal Malaysian Customs Department on 29 December 2014 with reference number 001836703744 and later was abolished by government on 30 June 2018 because of re-implementation of Sales and Service Tax on 1 September 2018.

l) Budget Information
The annual budget is prepared on a cash basis. As the Financial Statements are prepared on an accrual basis, a Budget and Actual Comparison Statement is disclosed separately. The statement is prepared using the basis of annual budget prepared and only refers to operational budget.

The budget presented is for ASM reference and was approved by ASM Council.

3) CASH AND CASH EQUIVALENTS

	2018 RM	2017 RM
ASM		
Fixed Deposit		
Short Term Deposit	8,019,270	9,531,034
Cash and bank balances	618,810	109,515
	939,170	366,933
	9,577,250	10,007,482
Research, Development & Commercialisation Fund (R,D & C)		
Fixed Deposit	43,658,314	47,139,229
Cash and bank balances	215,614	381,656
	53,451,178	57,528,367

4) DEBTORS

	2018 RM	2017 RM
Debtors	3,693,687	853,311
	3,693,687	853,311

5) OTHER CURRENT ASSETS

	2018 RM	2017 RM
Advances	8,703	22,668
Receivables	841,867	942,591
Less: Provision for Doubtful Debts	(64,905)	(64,905)
	785,665	900,354

6) PROPERTY, PLANT AND EQUIPMENT

	Office Renovation	Vehicles	Office Equipment	Computer	Land Leasehold	2018	2017
	RM	RM	RM	RM	RM	RM	RM
Cost							
As at 1 January 2018	3,732,914	477,148	888,460	478,713	61,800	5,639,035	5,620,371
Additional	118,726	-	24,319	37,904	-	180,949	24,884
Disposal/Classification	-	-	(30,948)	(182,617)	-	(213,565)	-
31 December 2018	3,851,640	477,148	881,831	334,000	61,800	5,606,419	5,645,255
Accumulated Depreciation							
As at 1 January 2018	3,630,811	440,116	795,750	389,457	6,186	5,262,320	5,070,128
Additional	21,114	31,738	68,747	37,050	1,032	159,681	198,410
Disposal/Classification	-	-	(30,943)	(180,209)	-	(211,152)	-
31 December 2018	3,651,925	471,854	833,554	246,298	7,218	5,210,849	5,268,538
Book Value							
31 December 2018	199,715	5,294	48,277	87,702	54,582	395,570	-
As at 31 December 2017	122,754	68,770	189,664	112,408	56,648	-	376,716
Depreciation for 31 December 2018	24,068	32,854	106,104	58,164	1,032	-	198,410

7) CREDITORS

	2018 RM	2017 RM
General Creditors	1,185,300	1,379,742
Audit Fees	8,563	7,470
	1,193,863	1,387,212
Interest of R,D & C	3,642,461	6,593,479
	4,836,324	7,980,691

Interest of R,D&C are gain on investment derived from R,D&C provisions deposited in fixed deposits which are payable to the government.

8) EMPLOYEE BENEFITS

	2018 RM	As Restated 2017 RM
Current liabilities	329,794	240,689
Non-current liabilities	225,139	137,696

Provision of employees benefits has been allocated RM760,793 in the following years.

	RM	RM
Year 2014 and previous year	30,940	30,940
Year 2015	3,435	3,435
Year 2016	155,936	155,936
Year 2017	240,688	188,074
Year 2018	329,794	-
	760,793	378,385

9) DEFERRED GRANT

Programmes in implementation are as follows:

	2018 RM	As Restated 2017 RM
Study on Rare Earth	207,707	207,707
Asean Science Journal	-	28,201
MOSTI Social Innovation (MSI) - Duta Sains	173,721	211,305
MOSTI Commercialisation Conference Exhibition (MCCE)	-	2,000
Project Monitoring Team R,D&C	18,741	66,789
DSTIN Flagship	-	486,400
Bibliometrik	-	48,000
Newton Ungku Omar Fund (NUOF)	4,336,160	3,490,490
Top STEM Talent Malaysia (TSTM)	-	750,000
NPSTI	480,087	848,305
STI Master Plan	442,284	764,150
Tahun Sains	208,915	-
Science Outlook	100,000	516,468
	5,967,615	7,419,815
R,D&C	40,331,726	41,080,067
	46,299,341	48,499,882

The Deferred Grant is provision for 'special programme' entrusted to ASM by Ministry or any other party which covers a period of more than one accounting period.

10) OPERATIONAL FUND

Operational Fund is as follows:-

	2018 RM	As Restated 2017 RM
As at 1 January	1,652,074	403,004
Surplus/(Deficit) for the year	2,776,823	1,249,892
Adjustment	-	(822)
As at 31 December	4,428,897	1,652,074

11) ENDOWMENT FUND

The Endowment Fund is as follows:-

	2018 RM	As Restated 2017 RM
As at 1 January	171,856	60,100
Current year receivables	73,346	111,756
As at 31 December	245,202	171,856

The Endowment Fund is established to receive donations for ASM activities.

12) PROJECT FUND

The Project Fund is as follows:-

	2018 RM	As Restated 2017 RM
As at 1 January	920,240	977,050
Current year income	1,503,128	-
Current year expenses	(516,555)	(56,810)
As at 31 December	1,906,813	920,240

Projects included the Project Fund are the Tenth Malaysia Plan (10MP), the Ninth Malaysia Plan (9MP) , the Eighth Malaysia Plan (RMK-8) Projects and 2018 STI Programme activities.

	2018 RM	As Restated 2017 RM
Malaysian Antarctica Research Program and International Programme	1,016	1,016
Scientific Expedition	96,898	96,898
National Nobel Laureate Programme and Scientific Advancement Grant Allocation (SAGA)	561	561
Publications	48	1,248
Science Education and National Science Quiz	555,810	711,883
S&T Management Training Programme	88,536	95,568
Mega Science Framework II	12,723	13,066
Impact Study on the Implimentation of the Malaysian Research Universities	553,336	-
Mid - Term Review of Malaysia Education Blueprint 2015 - 2025	597,885	-
Balance as at 31 December	1,906,813	920,240

13) CAPITAL RESERVE FUND

The Capital Reserve Fund is as follows:-

	2018 RM	As Restated 2017 RM
Balance as at 1 January	55,620	56,650
Leasehold Land	-	-
	55,620	56,650
Deduct:		
Lease Payment	1,030	1,030
Balance as at 31 December	54,590	55,620

The Capital Reserve Fund represents the cost of leasehold land acquired on 21 June 2012 with a lease term of 60 years. The lease payment is made annually at a rate of RM1,030.00.

14) NON EXCHANGE TRANSACTION

	2018 RM	As Restated 2017 RM
Operating Grant	11,521,000	11,584,900
Development Grant	13,590,969	31,226,872
	25,111,969	42,811,772

15) EXCHANGE TRANSACTION

	2018 RM	As Restated 2017 RM
Current Account Interest	6,890	5,561
Fixed Deposit Interest	204,491	293,924
	211,381	299,485

16) OTHER INCOME

	2018 RM	As Restated 2017 RM
Other Receivables	924,360	70,452
Registration Fee for Training	16,300	123,813
Programme Management Fee	330,000	330,000
Rental	55,000	65,000
Profit from disposal of asset	2,395	-
	1,328,055	589,265

17) EMPLOYEES INFORMATION

The total number of ASM employees on 31 December 2018 is 79 (31.12.2017: 71).

18) RELATED PARTY DISCLOSURE

	2018 RM	As Restated 2017 RM
ASM Council Member		
Total ASM Council Member Allowances	31,250	40,000
Others Key Management Personnel		
Short-term benefits	234,385	201,523

Council members include the President and Ordinary Council members. Top management personnel is the Chief Executive Officer who has the authority and responsibility for planning, directing and controlling the activities of ASM either directly or indirectly.

19) COMPARATIVE FIGURES

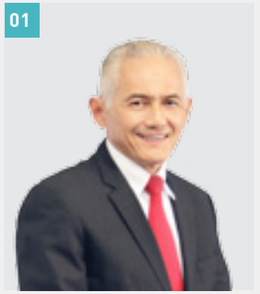
During the financial year, ASM reclassified the following comparatives to comply with the current financial year's presentation:

Statement of Financial Position	As Stated Earlier 2017 RM	As Restated 2017 RM
Current Liability		
Employee Benefits	153,246	240,689
Long Term Liability		
Employee Benefits	225,139	137,696
	378,385	378,385

ASM EXCO MEMBERS




ORDINARY COUNCIL MEMBERS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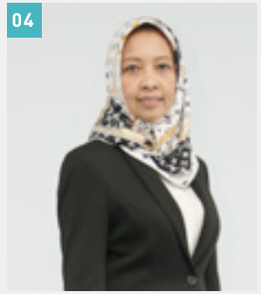
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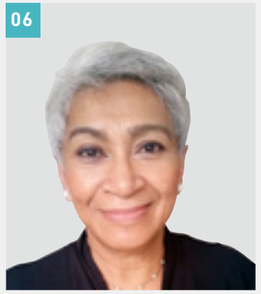
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12

AHLI MAJLIS / COUNCIL MEMBERS

PROFESSOR DATUK DR ASMA ISMAIL FASc
PRESIDENT
DEC 2017 – DEC 2019
MEDICAL AND HEALTH SCIENCES

YM ACADEMICIAN DATUK DR TENGKU MOHD AZZMAN SHARIFFADEEN FASc
VICE-PRESIDENT
APR 2018 - APR 2020
INFORMATION TECHNOLOGY AND COMPUTER SCIENCES

ACADEMICIAN TAN SRI DATO' IR Ts AHMAD ZAIDEE LAIDIN FASc
SECRETARY GENERAL
APR 2017 – APR 2019
ENGINEERING SCIENCES

DATUK DR ABDUL RAZAK MOHD ALI FASc
HONORARY TREASURER
APR 2017 - APR 2019
SCIENCE & TECHNOLOGY DEVELOPMENT AND INDUSTRY

AHLI MAJLIS BIASA / ORDINARY COUNCIL MEMBERS

01) **DATUK IR (DR) ABDUL RAHIM HASHIM FASc**
APR 2017 – APR 2019
ENGINEERING SCIENCES

02) **IR Ts CHOO KOK BENG FASc**
APR 2017 - APR 2019
SCIENCE & TECHNOLOGY DEVELOPMENT AND INDUSTRY

03) **ACADEMICIAN PROFESSOR DATO' DR KHAIRUL ANUAR ABDULLAH FASc**
APR 2017 – APR 2019
MEDICAL AND HEALTH SCIENCES

04) **PROFESSOR DATUK DR HALIMATON HAMDAN FASc**
APR 2017 - MAR 2019
CHEMICAL SCIENCES

05) **ACADEMICIAN DISTINGUISHED PROFESSOR DATUK DR LOOI LAI MENG FASc**
APR 2017 – APR 2019
MEDICAL AND HEALTH SCIENCES

06) **ACADEMICIAN EMERITA PROFESSOR DATUK DR MAZLAN OTHMAN FASc**
APR 2017 – FEB 2019
SCIENCE & TECHNOLOGY DEVELOPMENT AND INDUSTRY

07) **DATUK FADILAH BAHARIN FASc**
APR 2017 – APR 2019
SCIENCE & TECHNOLOGY DEVELOPMENT AND INDUSTRY

08) **PROFESSOR DATO' DR AISHAH BIDIN FASc**
APR 2018 - APR 2020
SOCIAL SCIENCES AND HUMANITIES

09) **PROFESSOR DR AHMAD ISMAIL FASc**
APR 2018 – APR 2020
BIOLOGICAL, AGRICULTURAL AND ENVIRONMENTAL SCIENCES

10) **IR DR AHMAD FAIZAL MOHD ZAIN FASc**
APR 2018 - APR 2020
ENGINEERING SCIENCES

11) **PROFESSOR DATO' DR AWG BULGIBA AWG MAHMUD FASc**
APR 2018 - APR 2020
MEDICAL AND HEALTH SCIENCES

12) **EMERITUS PROFESSOR DATO' DR KHALID YUSOFF FASc**
APR 2018 – APR 2020
MEDICAL AND HEALTH SCIENCES

HONORARY FELLOWS

1995
Tun Dr Mahathir Mohamad
Prime Minister of Malaysia

2005
Tun Abdullah Ahmad Badawi
Former Prime Minister of Malaysia

2009
Tun Ahmad Sarji Abdul Hamid
Former Chief Secretary to the Government

2010
Nobel Laureate Professor Lee Yuan Tseh
Nobel Laureate 1986 (Chemistry)

2014
Dato' Sri Mohd Najib Tun Abdul Razak
Former Prime Minister of Malaysia

Scan here to view the full list of ASM Expert Network

SENIOR FELLOWS

1999
- **Academician Emeritus Professor Tan Sri Datuk Dr Haji Omar Abdul Rahman FASc**
- **Academician Dato' Ir Lee Yee Cheong FASc**
- **Academician Emeritus Professor Tan Sri Datuk Dr Augustine Ong Soon Hock FASc**

2001
- **Academician Tan Sri Dato' Dr Mohd Rashdan Haji Baba FASc**

2002
- **Academician Emeritus Professor Dr Yong Hoi Sen FASc**
- **Academician Tan Sri Dato' Seri Ir Shamsuddin Abdul Kadir FASc**

2004
- **Academician Tan Sri Dr Salleh Mohd Nor FASc**

2005
- **Academician Distinguished Professor Datuk Dr Looi Lai Meng FASc**

2006
- **Academician Tan Sri Dr M. Jegathesan FASc**

2007
- **Academician Datuk Dr Abdul Aziz S.A. Kadir FASc**

2008
- **Academician Tan Sri Ir Shahrizaila Abdullah FASc**

2009
- **Academician Tan Sri Dr Ahmad Mustaffa Babjee FASc**

2010
- **Academician Emeritus Professor Dato' Dr V.G. Kumar Das Govinda Panicker FASc**
- **Academician Emeritus Professor Tan Sri Dato' Dr Syed Jalaludin Syed Salim FASc**

2011
- **Academician Tan Sri Dato' Ir Ts Ahmad Zaidee Laidin FASc**
- **Academician Emeritus Professor Dato' Dr CP Ramachandran FASc**
- **Academician Professor Dato' Ir Dr Chuah Hean Teik FASc**

2012
- **Academician Dr C. Devendra FASc**
- **Academician Datuk Fateh Chand FASc**
- **Academician Dr Ho Chee Cheong FASc**

2013
- **Academician Tan Sri Datuk Dr Yusof Basiron FASc**

2014
- **Academician Datuk Ir Hong Lee Pee FASc**
- **Academician Professor Dato' Dr Khairul Anuar Abdullah FASc**

2015
- **Academician Emeritus Professor Tan Sri Dato' Sri Dr Zakri Abdul Hamid FASc**
- **Academician Emeritus Professor Dato' Dr Lam Sai Kit FASc**

2016
- **Academician Emerita Professor Datuk Dr Mazlan Othman FASc**

2017
- **Academician Tan Sri Datuk Ir Dr Ahmad Tajuddin Ali FASc**

2018
- **Academician Datuk Dr Tengku Mohd Azzman Shariffadeen FASc**

ASM DISCIPLINE GROUP

Sains Perubatan dan Kesihatan
Medical and Health Sciences
Academician Professor Dato' Dr Khairul Anuar Abdullah FASc (Chairperson)
Professor Dato' Dr Awg Bulgiba Awg Mahmud FASc (Alternate Chair)

Sains Kejuruteraan
Engineering Sciences
Professor Dato' Ir Dr A. Bakar Jaafar FASc (Chairperson)
Datuk Ir (Dr) Abdul Rahim Hashim FASc (Alternate Chair)

Sains Biologi, Pertanian dan Alam Sekitar
Biological, Agricultural and Environmental Sciences
Dr Helen Nair FASc (Chairperson)
Professor Dato' Dr Mohamed Shariff Mohamed Din FASc (Alternate Chair)

Matematik, Fizik dan Sains Bumi
Mathematics, Physics and Earth Sciences
Academician Professor Dato' Ir Dr Chuah Hean Teik FASc (Chairperson)
Professor Dato' Indera Dr Rosihan Mohamed Ali FASc (Alternate Chair)

Sains Kimia
Chemical Sciences
Emeritus Professor Dato' Dr Laily Din FASc (Chairperson)
Professor Dr Yang Farina Abdul Aziz FASc (Alternate Chair)

Pembangunan Sains & Teknologi dan Industri
Science & Technology Development and Industry
Dato' (Dr) Ir Andy Seo Kian Haw FASc (Chairperson)
Ir Choo Kok Beng FASc (Alternate Chair)

Sains Sosial dan Kemanusiaan
Social Sciences and Humanites
Professor Dato' Dr Aishah Bidin FASc (Chairperson)
Professor Dr Mahendhiran Sanggaran Nair FASc (Alternate Chair)

Teknologi Maklumat dan Sains Komputer
Information Technology and Computer Sciences
Emeritus Professor Dato' Seri Ir Dr Mashkuri Yaacob FASc (Chairperson)
Professor Dr Mohamed Ridza Wahiddin FASc (Alternate Chair)

WORKING COMMITTEES & TASK FORCE

Jawatankuasa Kewangan dan Pelaburan
Finance and Investment Committee
Datuk Dr Abdul Razak Mohd Ali FASc
(Honorary Treasurer)

Jawatankuasa Audit
Audit Committee
Datuk Dr Mohd Basri Wahid FASc

Jawatankuasa Keahlian
Membership Committee
YM Academician Datuk
Dr Tengku Mohd Azzman Shariffadeen FASc
(Vice-President)

Jawatankuasa Penerbitan
Publication Committee
Academician Tan Sri
Dato' Ir Ts Ahmad Zaidee Laidin FASc
(Secretary General)

Lembaga Editorial Jurnal Sains ASM
ASM Science Journal Editorial Board
Professor Datin Paduka
Dr Khatijah Mohd Yusoff FASc

Badan Bertindak Kajian Semula Akta ASM
Task Force on ASM Act Review
Academician Tan Sri
Dato' Ir Ts Ahmad Zaidee Laidin FASc
(Secretary General)

Jawatankuasa Dana Sumbangan ASM
ASM Endowment Fund Committee
Datuk Dr Mohinder Singh S. Sucha Singh FASc

Jawatankuasa Tatatertib bagi Kumpulan Pengurusan Tertinggi ASM
Disciplinary Committee for ASM Top Management Group
Academician Tan Sri
Dato' Ir Ts Ahmad Zaidee Laidin FASc
(Secretary General)

Jawatankuasa Rayuan Tatatertib bagi Kumpulan Pengurusan Tertinggi ASM
Disciplinary Appeal Committee for ASM Top Management Group
YM Academician Datuk
Dr Tengku Mohd Azzman Shariffadeen FASc
(Vice-President)

Jawatankuasa Felo Kanan
Senior Fellows Committee
Academician Emeritus Professor
Tan Sri Datuk Dr Omar Abdul Rahman FASc

ASM CHAPTERS

ASM Northern Region Chapter
Professor Ir Dr Abdul Rahman Mohamed FASc

ASM Southern Region Chapter
Professor Datuk Dr Ahmad Fauzi Ismail FASc

ASM STUDIES COMMITTEES

Science, Technology and Innovation Policy Advisory Committee (STIPAC)
Professor Datuk Dr Asma Ismail FASc
(President)

STI Policy and Strategic Working Group (under STIPAC)
YM Academician Datuk
Dr Tengku Mohd Azzman Shariffadeen FASc
(Vice-President)

Committee on Water
Dr Ir Salmah Zakaria FASc

Transforming the Water Sector: National IWRM Plan – Strategies & Roadmap
Academician Tan Sri
Dato' Ir Hj Shahrizaila Abdullah FASc

Disaster Risk Reduction (DRR) Research Alliance Committee
Professor Dr Joy Jacqueline Pereira FASc

Water Demand Management for Sarawak
Tan Sri Dato'
Ir Syed Muhammad Shahabudin FASc

Special Interest Group on Precision Medicine Initiative for Malaysia
Professor Datuk Dr A Rahman A Jamal FASc

Formulation of Science, Technology & Innovation Master Plan (STI MP) 2020 – 2030
Dato' Dr Rahmah Mohamed FASc
(Project Director)

Review and Formulation of National Policy on Science, Technology and Innovation (NPSTI) 2021 - 2030
Professor Dato'
Dr Awg Bulgiba Awg Mahmud FASc
(Project Director)

Harmonisation of NPSTI and STI Master Plan 2021-2030
Professor Datuk Dr Asma Ismail FASc

Special Interest Group on Machine Learning
YM Academician Datuk
Dr Tengku Mohd Azzman Shariffadeen FASc

Task Force on Science of Halal Initiatives in Malaysia
Academician Tan Sri Dato'
Ir Ts Ahmad Zaidee Laidin FASc

Malaysian Blockchain Alliance
Datuk Fadilah Baharin FASc

Mid-term Review of Malaysia Education Blueprint 2015-2025 (Higher Education)
Professor Ir Dr Abdul Aziz Abdul Raman FASc

Impact Study on the Implementation of Research Universities (RU)
Professor Dr Mahendhiran Sanggaran Nair FASc

PROGRAMME COMMITTEES

Science Awards Steering Committee
Academician Tan Sri
Dato' Ir Ts Ahmad Zaidee Laidin FASc
(Secretary General)

Task Force on ASM ArtScience Award
Ar Hijjas Kasturi FASc

MAKNA Cancer Research Award Vetting Panel
Professor Datin Paduka
Dr Khatijah Mohd Yusoff FASc

Top Research Scientist Malaysia (TRSM) Selection Panel
Academician Tan Sri Datuk Dr Yusof Basiron FASc

Top Research Scientists Malaysia (TRSM) Monitoring Committee
Professor Dr Noorsaadah Abd Rahman FASc

Dr Ranjeet Bhagwan Singh Medical Research Trust Fund Programme Steering Committee
Academician Distinguished Professor
Datuk Dr Looi Lai Meng FASc

YSN-ASM Membership Selection Panel
YM Academician Datuk
Dr Tengku Mohd Azzman Shariffadeen FASc
(Vice-President)

Newton-Ungku Omar Fund (NUOF) Committee for Programmes with British Council
Emeritus Professor
Dato' Seri Mashkuri Yaacob FASc

Newton-Ungku Omar Fund (NUOF) Committee for Programmes with Royal Society
Academician Tan Sri
Dato' Ir Ts Ahmad Zaidee Laidin FASc

Newton-Ungku Omar Fund (NUOF) Committee for Programmes with Medical Research Council
Academician Distinguished Professor Datuk
Dr Looi Lai Meng FASc

S&T and Industry Linkages Committee
Ir Ts Choo Kok Beng FASc

ASM Science Education Committee
Academician Datuk Dr Abdul Aziz S.A. Kadir FASc
Dr Ahmad Ismail FASc
(Alternate Chair)

Joint-Steering Committee on National Centre for Particle Physics (NCPP)
Emeritus Professor Dato'
Dr Muhammad Yahaya FASc

Joint-Steering Committee on National Centre for Nanomite
Professor Datuk Dr Halimaton Hamdan FASc

Task Force for the Establishment of National Centre for Material Sciences
Academician Emeritus Professor Dato'
Dr VG Kumar Das Govinda Panicker FASc

Task Force for the Establishment of National Centre for Scientific Enterprise and Quran
Professor Tan Sri Dato'
(Dr) Dzulkifli Abdul Razak FASc

National Science Challenge Steering Committee
Professor Dr Noorsaadah Abd Rahman FASc

Imbak Canyon Rainforest Research & Training Programme Task Force
Academician Tan Sri Dr Salleh Mohd Nor FASc

Young Scientists Network (YSN-ASM)
Professor Dr Abhi Veerakumarasivam

ASEAN Network of Young Scientists Interim Committee
Professor Dr Abhi Veerakumarasivam

Malaysian Technical Corporation Programme (MTCP) Organising Committee
Emeritus Professor Dato' Dr Ibrahim Komoo FASc

INTERNATIONAL REPRESENTATIVES

Global Science and Innovation Advisory Council (GSIAC)
Professor Datuk Dr Asma Ismail FASc
(ASM President)

The Interacademy Partnership (IAP)
Professor Datuk Dr Asma Ismail FASc
(ASM President)

International Institute for Applied Systems Analysis (IIASA)
Professor Datuk Dr Asma Ismail FASc
(ASM President)

Network of Academies of Sciences in the Islamic Countries (NASIC)
Professor Datuk Dr Asma Ismail FASc
(ASM President) / Council Member

International Silk Road Academy of Sciences (ISRAS)
Professor Datuk Dr Asma Ismail FASc
(ASM President)

Association of Academies and Societies in Asia (AASSA)
Academician Professor Dato' Dr Khairul Anuar Abdullah FASc
Vice-President AASSA

Interacademy Partnership for Health (IAP-H)
Academician Distinguished Professor Datuk Dr Looi Lai Meng FASc
Executive Committee

International Science Council (ISC)
Professor Ir Dr Ahmad Faizal Mohd Zain FASc

Science Council of Asia (SCA)
Professor Dato' Ir Dr A. Bakar Jaafar FASc

Interacademy Partnership for Science Education Programme (IAP SEP)
Academician Dato' Ir Lee Yee Cheong FASc
Chairman

The World Academy of Sciences (TWAS)
Professor Datuk Dr Asma Ismail FASc

Interacademy Partnership for Urban Health
Dato' Professor Dr Awg Bulgiba Awg Mahmud

Interacademy Partnership for Science for Poverty Eradication Committee (IAP SPEC)
Professor Dato' Dr Aishah Bidin FASc

ISTIC
YM Academician Datuk Dr Tengku Mohd Azzman Shariffadden FASc
Executive Committee

APEC Policy Partnership on STI (PPSTI) Working Group Meeting
Hazami Habib
(Chair, Sub-Committee of Capacity Building Cluster)

LIST OF ACTIVITIES

JANUARY

Meeting with Chairman of Halal Science Initiative
2 January

STI MP Stakeholders Engagement Pre-Workshop Briefing
4 January

Strategic Consultative Workshop on the STIMP Study
9 January

NPSTI ST2 2nd WG Meeting
10 January

NPSTI ST5 2nd WG Meeting
11 January

Presentation on STEM Centre Governance Structure to MOE
11 January

Meeting between ASM and DYMM Tuanku Sultan Nazrin Shah on Envisioning Malaysia 2050
11 January

Talk on S&T Foresight Malaysia 2050 to Malaysian Nuclear Malaysia
11 January

NPSTI ST1 3rd WG Meeting
12 January

YSN-ASM Exco Meeting
15 January

Meeting with Prime Minister's Office on TN50 Report
15 January

Astro Awani Interview with ASM CEO on IBSE and STEM
16 January

NPSTI ST4 3rd WG Meeting
17 January

NPSTI ST3 3rd WG Meeting
17 January

STI MP Pre-Stakeholders Engagement Workshop Meeting
19 January

Internal Discussion on APTJSO 2017
19 January

STI MP Stakeholder Engagement Workshop
23 January

ASM Science Awards Steering Committee Meeting: 2017 MSA and 2018 Royal Society Medals and Awards
23 January

2017 Annual Report Workshop
24 - 26 January

CEO@Faculty Science Programme
25 January

NPSTI ST4 Governance Stakeholder Engagement Workshop
26 January

NPSTI ST2 Talent Review Meeting
26 January

3rd Meeting Task Force on ASM Art Science Prize
26 January

Presentation on IR 4.0 at the Cluster of Economics
26 January

NPSTI ST2 Talent Review Meeting
27 January

STIMP Stakeholder Engagement Workshop
30 January

FEBRUARY

NPSTI Steering Review Consolidation Workshop
2-4 February

Forum Pemerkasaan Wanita dalam S&T Sempena Dialog TN50 bersama YB Menteri MESTECC
3 February

Promoting Safe and Secure Science through a Regional Middle East and South Asia Biological Sciences Conference
5-10 February

Vetting Committee Meeting for Medical & Health Sciences Discipline
5 February

ASM Science Journal Editorial Board Meeting 1/2018
5 February

STI MP Stakeholder Engagement Workshop
6 February

Vetting Committee Meeting for Mathematics, Physics & Earth Sciences Discipline
6 February

ASM Halal Science Initiative's Meeting
7 February

TRSM New System Development Meeting
7 February

Launching of RCR Malaysian Educational Module
8 February

ASM Induction Session for Newly Appointed Associates
8 February

Agriculture Water Services and Integrated Urban Water Management Discussion
8 February

Vetting Committee Meeting for Social Sciences & Humanities Discipline
9 February

SIGML Discussion
9 February

124th Finance Meeting
9 February

Vetting Committee Meeting for IT & Computer Sciences Discipline
9 February

Vetting Committee Meeting for S&T Development Industry Discipline
12 February

22nd STIPAC Meeting
12 February

59th Exco Meeting
13 February

STI MP Stakeholder Engagement Workshop
13 February, UMS

Mesyuarat Pre-Jawatankuasa Tadbir Urus (JKTU)
14 February

Vetting Committee Meeting for Biological, Agricultural and Environmental Sciences Discipline
14 February

Vetting Committee Meeting for Engineering Sciences Discipline
15 February

Consultative Meeting on Blockchain Technology
19 February

Halal Science Strategic Planning Workshop 2.0
21 February

STI MP Governance Meeting
22 February

NPSTI ST6 2nd WG Meeting
22 February

Karnival Negaraku Berinovasi Zon Sabah
26-28 February

STI MP Stakeholder Engagement Workshop
27 February

29th ASM Water Committee Meeting
28 February

MARCH

STI MP Governance 5th WG Meeting
2 March

STI MP Economics and Finance 3rd WG Meeting
2 March

Discussion on NEO and SIGML
5 March

Mesyuarat bagi Program National School of Particle Physics 2018
5 March

ASM Senior Fellow's Meeting
5 March

128th Council Meeting
8 March

28th Idea Xchange - STI MP Study (2020 -2030) Regional Strategic Stakeholder Consultation Workshops Findings
8 March

Sesi Sindikasi Penambaikan Draf Pelan Strategik STEM Nasional
9 March

Technical Committee Meeting Duta Sains Tangga Batu 2.0
9 March

Meeting with CCM on Science Discovery Challenge
9 March

ASM Special Panel Meeting
12 March

Discussion on Delphi Survey on Blockchain
14 March

STI MP Study 2020-2030 Initial Findings and Proposed Strategies "Test-Bed" Session
15 March

Meeting on Review of ASM Act
16 March

LIST OF ACTIVITIES

ASM Fellows' Lecture by Ir Dr Zuhairi Abd Hamid FASc Design Revolution for Affordable Housing in Tropical Country
19 March

Biological, Agricultural and Environmental Sciences Group Discipline Meeting
20 March

Meeting on Anugerah Saintis Muda
22 March

STI MP Talent 2nd Working Group Meeting
23 March

2nd Consultative Meeting on Blockchain Technology
26 March

Steering Committee at MITI on Industry 4.0 National Policy 2/2018
27 March

125th Finance Meeting
30 March

APRIL

RCR Workshop
1-4 April

Minggu Sains Negara 2018: Bengkel Pengenalan IBSE
2-3 April

CCM STEM Up Challenge
2-3 April

Launching of Science Outlook 2017
3 April

ICRRTP Seminar
4 April

7th Task Force Meeting on the Establishment of the National Centre for Materials Science
5 April

Joint Steering Committee Meeting for NPSTI and STIMP
5 April

ASM Fellow's Lecture by Professor Dr Yvonne Lim Ai Lian FASc - Debunking the Myth about Gut Worms by Unlocking the Secrets of Gut Microbiota
5 April

ASM Membership Committee Meeting 1/2018
6 April

Karnival Sains - Minggu Sains Negara Peringkat Negeri Johor
7-8 April

2017 MAKNA Cancer Research Award Ceremony
9 April

Reshaping Malaysia's Development through Machine Learning Workshop
9 April

129th Council Meeting
13 April

STEM Workshop
13 April

2017 NSC Sakura Exchange Programme
15-21 April

SIGML Workshop Teleconference with CREST
16 April

Review of ASM Act Workshop
16 April

Discussion with NPSTI Chairman on Enculturation
17 April

STI MP Economic & Finance Meeting with Dr Razali Mohamed Ali (CIMB Berhad)
17 April

Discussion with Project Director NPSTI Steering on Review for MOSTI Technical Committee Meeting
19 April

Malaysian Video Selection Workshop -APTJSO
19 April

Discussion on TRSM Database
20 April

NPSTI Discussion with Project Director
20 April

NSC 2018 Question Committee Workshop
21-22 April

23rd AGM Pre-Meeting
24 April

NPSTI ST1 4th WG Meeting
25 April

NPSTI ST4 Governance WG Meeting
26 April

Meeting with Merdeka Award Secretariat on 2018 Merdeka Meeting
26 April

Discussion on "Toward The Future We Want For All From Science To Implementation"
26 April

11th GA - Sustainability Science: The World We Want For All
28 April

23rd AGM
28 April

MAY

NPSTI ST2 Talent 3rd Working Group Meeting
2 May

Workshop:Focused Clinic: Routes To PEng/Ceng
3 May

NPSTI Technical Committee Meeting
3 May

8th Audit Committee Meeting
3 May

18th Mahathir Science Award Foundation Board of Trustees Meeting
4 May

Interview Session with British Council UK on Newton Researcher Links impact in Malaysia
7 May

NPSTI ST6 International Alliances 3rd Working Group Meeting
7 May

Discussion on STI MP Writer
14 May

APTJSO Final Malaysia Selection
14 May

5th NPSTI Steering Committee Meeting
14 May

126th Finance Meeting
16 May

Vetting Modules of APTJSO with MOE and MESTECC Experts
17 May

Meeting with ASM Past Presidents
21 May

60th Exco Meeting
21 May

Meeting on ASEAN Agenda
22 May

Mesyuarat Pemantauan Projek Flagship FP1213E036 & FP0712E012
23 May

NPSTI ST3 Industry Discussion
23 May

NPSTI ST2 4th Working Group Meeting
24 May

Meeting on Progressive Malaysia 2050
25 May

Meeting with Invest Selangor
25 May

Meltwater Discussion
25 May

Joint Meeting with Leaders of ST1 RDC (NPSTI) & Infrastructure Focus Area (STI MP)
28 May

Framing Progressive Malaysia 2050: Recommendation and Actions
31 May

LIST OF ACTIVITIES

JUNE

SIGML Teleconference with CREST
1 June

2018 MTCP – Global Geopark Management Organising Committee Meeting
1 June

SIG on Precision Medicine Meeting
4 June

Discussion on Collaborative Network and Trusted Neutral Entity for Halal Industry
4 June

Media Announcement on Outstanding Malaysian Young Scientists' Participation to International Programmes
5 June

Evaluation Meeting for Newton Mobility Grants (Social Sciences & Humanities) 2018
5 June

23rd STIPAC Meeting
5 June

NPSTI ST5 Enculturation 4th WG Meeting
5 June

19th MSAF Board of Trustees Meeting & 7th AGM
6 June

ASM Halal Science Initiative Meeting
6 June

Meeting with PETRONAS on ICRRTP
7 June

NPSTI ST2 Talent Meeting
7 June

Discussion with Thrust Leader on NPSTI and STIMP on Governance
8 June

2017 Ranjeet Bhagwan Singh Selection Committee Meeting
12 June

Discussion with the STIMP Writer's Team (UNMC)
12 June

Discussion on the STIPAC Feedback and the Way Forward for the STIMP Interim Report
21 June

NPSTI -ST2 Talent 5th Working Group Meeting
25 June

Newton Mobility Grants 2018 Selection Meeting (Natural Sciences) - Royal Society
26 June

Joint Meeting STIMP and NPSTI on Governance
26 June

NPSTI ST1 RDC 5th WG Meeting
26-27 June

ASM Aidilfitri Gathering 2018
26 June

Briefing for State Level 2018 National Science Challenge
26 June

ASM Science Journal Editorial Board Meeting 2/2018
27 June

RCR Active Learning Training
28 June

TRSM Evaluation Meeting
28 June

NPSTI ST4 Governance 5th WG Meeting
29 June

Discussion on ASM Water-Borned Intectious Dieases Workshop
29 June

JULY

Discussion on STIMP Interim Report and ICSU Report ISDG
2 July

Joint Meeting NPSTI ST2 Talent Meeting with the STIMP Talent WG
2 July

2018 NSC Kuala Lumpur State Level
2 July

2018 NSC Kelantan State Level
2 July

Discussion on with MIGHT on ASM Flagship DSTIN Project
2 July

2018 NSC Selangor State Level
3 July

2018 NSC Terengganu State Level
3 July

2018 NSC Putrajaya State Level
4 July

2018 NSC Pahang State Level
4 July

Evaluation Meeting for Newton Mobility Grants (Natural Sciences)
5-6 July

Evaluation Meeting for Newton Mobility Grants (Social Sciences & Humanities)
6 July

Perbincangan Mengenai Pelan Tindakan bagi Kumpulan STIMP - Talent
6 July

NPSTI ST6 International Alliance 4th WG Meeting
9 July

2018 YSN-ASM Selection Meeting
9 July

2018 NSC Perak State Level
9 July

2018 NSC Melaka State Level
10 July

Selection Meeting for IAP Young Physician Leaders Programme 2018
11 July

2018 NSC Negeri Sembilan State Level
10 July

2018 NSC Kedah State Level
12 July

Skype Discussion on ASM-IIASA Haze Meeting
12 July

Meeting on Co-Data with Academician Professor Emerita Datuk Dr Datuk Mazlan Othman FASc
13 July

2018 NSC Perlis State Level
13 July

NPSTI ST3 5th WG Meeting
13 July

Interview Session for 2018 YSN-ASM
16 July

2018 NSC Sarawak State Level
16 July

NPSTI 6th Steering Committee Meeting
17 July

Preparation Meeting for Courtesy Visit to YAB Prime Minister
17 July

130th Council Meeting
19 July

2018 NSC Johor State Level
19 July

Closed Meeting with CEP
19 July

Closed Meeting with MESTECC Minister
19 July

ASM Induction Session to Newly Elected Fellows
19 July

2018 NSC Labuan State Level
19 July

Conference Call with CREST on SGIML
20 July

Joint Meeting between NPSTI and STI MP Governance WG
20 July

2018 NSC Sabah State Level
23 July

Discussion with the President of CODATA
24 July

Open Science Platform Meeting
24 July

Meeting with YAB Prime Minister
24 July

7th APTJSO Briefing
25 July

TRSM System and Database Meeting
26 July

127th Finance Meeting
27 July

7th APTJSO
29 July - 4 August

AUGUST

ASM Consultative Meeting on Blockchain
1 August

STI MP Governance Working Group Meeting
1 August

Discussion with NPSTI Project Director
1 August

29th Idea Xchange - Presentation on NPSTI 2021-2030: Review and Formulation Study
1 August

Water–Borne Conference Meeting
1 August

Discussion on Selection Exercise of ASM Fellows
3 August

Meeting with Halal Science Writers
7 August

Meeting with STIMP Working Group Chairs and Writers on the Final Report Draft
8 August

Mesyuarat Penyelarasan Bahagian Perkhidmatan Korporat
9 August

2018 NSC Semi Final
9-15 August

NPSTI ST6 International Alliances 5th WG Meeting
9 August

NPSTI ST3 Industry 5th WG Meeting
9 August

ASM Membership Committee Meeting
13 August

LIST OF ACTIVITIES

AASSA–ASM Conference on Water-borne Infectious Diseases
15-16 August

STI MP Steering Committee Meeting
16 August

Special Panel to Evaluate and Endorse Knowledge Driven Syntactic Parsing Intelligence (KRISPI) Technology
16 August

Discussion on ASM Water Food Energy Nexus Study's
20 August

Meeting with SASBADI on NSC Grand Final
21 August

TEDx- Journey Towards the Future by ASM CEO
25 August

Proposed Meeting between ASM and HDC on Policy Study
27 August

Renewal Energy 2025 Discussion between ASM and SEDA
27 August

SEPTEMBER

RCR Workshop
2-5 September

Briefing on NSC Grand Final
3 September

24th STIPAC Meeting
3 September

Delegation Visit by UM
4 September, ASM

TRIZ: The Art of Innovation Workshop
6 & 7 September

Talk by Catarina Tully Entitled the Growing Interest in Strategic Foresight
6 September

2018 NSC Grand Final
13 September

61st Exco Meeting
14 September

2nd YSN-ASM Exco Meeting
14-16 September

2018 MTCP – Global Geopark Management: Geopark for Sustainable Tourism
15-20 September

Anugerah Saintis Muda Workshop
19 September

Meeting between ASM SIGML and CREST on Position Paper on Machine Learning
20 September

7th WG Meeting on NPSTI ST2 Developing, Harnessing and Intensifying Talent
21 September

Lawatan Pemantauan Duta Sains 2.0 ke Tangga Batu
21 September

ISC-ASM Open Science Network Discussion
24 September

6th WG Meeting on NPSTI ST1 RDC
24 September

Meeting on NIWRMP
24 September

Forum on STI MP
25 September

8th National Centre for Materials Science (NCMS) Task Force Meeting
25 September

Meeting on the 1st ASM DRR Research Alliance Committee
25 September

STEM Teacher Training Module Development Workshop
26 September

5th WG Meeting on NPSTI ST5 Promoting and Sensitising STI
26 September

Higher Education Policy Studies Proposals Presentation
27 September

4th Meeting of Taskforce on ASM ArtScience Prize
28 September

OCTOBER

7th NPSTI Steering Committee Meeting
1 October

ASM Fellows' Lecture: Novel Polymeric Materials Synthesized from Palm Oil and Their Applications by Professor Dr Gan Seng Neon FASc
2 October

TRSM Monitoring Committee Meeting
2 October

6th WG Meeting NPSTI ST6 International Alliances
4 October

Imbak Canyon Meeting with CEO ASM
4 October

128th Finance Meeting
5 October

Discussion between STI MP Group Leaders and Writers Team
8 October

131st Council Meeting
8 October

Launching of Local & Transboundary Haze Study Report
8 October

30th IdeaXchange
8 October

Discussion on the Half-Day Networking Session and Public Talk with CREST
9 October

Young Makers Pre-Bootcamp
10-11 October

NPSTI ST1 Governance 7th WG Meeting
11 October

HOD Strategic Meeting
12-14 October

Coffee Chat on ASM ArtScience Prize
13 October

Stakeholder Engagement Series on NPSTI ST2 Advancing Scientific & Social RDC
15 October

Stakeholder Engagement Series on NPSTI ST5 Promoting & Sensitising STI
16 October

ASM Fellows' Lecture on Malaysian Nobelist Mindset 2030: Challenges and Opportunities by Dr Zainal Ariffin Ahmad FASc
18 October

ASM Fellows' Lecture on Maternal Mortality to Maternal Health by Professor Dato' Dr Ravindran Jegasothy FASc
18 October

25th STIPAC Meeting
19 October

Young Makers Innovation Challenge
21 October

8th WG Meeting on NPSTI ST3 Developing, Harnessing & Intensifying Talent
22 October

Organising Committee Meeting for Conferment Ceremony
22 October

Meeting with Halal Science Report Writer
23 October

4th Consultative Meeting on Blockchain Technology
23 October

ASM Science Award Steering Committee Meeting
23 October

Stakeholder Engagement Series on NPSTI ST4 Industry
25 October

NPSTI ST2 RDC 8th WG Meeting
25 October

Stakeholder Engagement Series on NPSTI ST3 Talent
26 October

Stakeholder Engagement Series on NPSTI ST1 Transforming STI Governance
29 October

IBSE Module Development Workshop
29 October

TYAN-YSN International Workshop on Cancer Research 2018
30 October-1 November

LIST OF ACTIVITIES

NOVEMBER

Conferment of Fellowship of ASM & Announcement of TRSM
1 November

Workshop on STIMP Ministerial
8 November

TRSM Selection Panel Re-evaluation Meeting
8 November

6th WG Meeting on NPSTI ST5 STI Enculturation
9 November

Consolidation Workshop on NPSTI Study
12-14 November

Visit by Cambodia National S&T General Secretariat
13 November

Meeting on Hydrogen Technology
14 November

Forum on National Unity Consultative Council (NUCC) Report
15 November

ASM Fellows' Lecture: Road Towards 5G Mobile Communication Evolution or Revolution by Professor Dr Tharek Abd Rahman FASc
15 November

Joint Technical Committee Meeting on NPSTI
19 November

2nd IBSE Module Development Workshop
21-22 November

TRSM Monitoring Committee Workshop
21 November

Meeting on SIG Precision Medicine
22 November

Meeting with Penang Science Cluster
23 November

National Workshop on NPSTI 2021-2030
26-27 November

Discussion on NPSTI 2021-2030 with Project Director
28 November

30th ASM Water Committee Meeting
29 November

Discussion with SIRIM on Technology and Market Radar Engagement of ASM Experts
29 November

ASM Fellows' Lecture on Industry 4.0 Ecosystem: Leap-frogging Strategies in a Hyper-Converged Global Economy by Professor Dr Mahendhiran Sanggaran Nair FASc
29 November

DECEMBER

5th Malaysian Blockchain Alliance Meeting
3 December

MAKNA Selection Panel Meeting
4 December

Finance Committee Meeting
5 December

Sending Off NSC Champion for Stockholm Visit
5 December

26th STIPAC Meeting
6 December

2018 NSC Stockholm Visit
6-12 December

132nd Council Meeting
7 December

2018 YSN-ASM Colloquium
7-9 December

2018 NSC First Runner-Up Study Visit to Silicon Valley
10-14 December

8th NPSTI Steering Committee Meeting
11 December

2nd ASM DRR Research Alliance Committee Meeting
12 December

Malaysian in Space Special Issue Meeting 3/2018
12 December

Discussion on MOE Studies
13 December

9th WG Meeting on NPSTI ST3 Talent
14 December

Pre-Meeting on Review of ASM Act
18 December

White Paper on Blockchain Technology Discussion
18 December

Discussion on Harmonisation of NPSTI & STI MP Action Plans
19 December

Discussion on Mid-Term Review of MEB 2015-2025 HE
21 December

ASM MANAGEMENT

AS OF DEC 2018

Chief Executive Office
Hazami Habib
Chief Executive Officer
Norazirah Ramli
Secretary

Bureau of International Affairs
Nurhanani Zainuddin
Executive
Aimi Suraya Abdul Kahar
Executive

STI Strategic Studies Unit
Nitia Samuel
Principal Analyst
Jagdish Kaur Chahil
Senior Analyst
Nur Zuriany Zaki
Senior Analyst
Shaneeta Visuvanathan
Analyst
Loh Chia Hur
Analyst
Mohd Ikhwan Abdullah
Analyst
Ratnamalar Rajasingam
Analyst
Noraina Jamal Rashid
Analyst
Muhammad Haikal Hikmal Hazam
Analyst
Mohamad Akmal Mahmud
Analyst
Areej Mohd Taufik
Analyst
Noratiqah Ahmad
Analyst
Sazarul Aini Sabot
Assistant Executive

STI Strategic Programmes Unit
Norazwa Musiran
Senior Executive (Head of Unit)
Nur Dayana Razmi
Executive (Deputy Head of Unit)
Hendy Putra Herman
Executive
Syazwani Ramli
Executive
Edzdiani Sharmeen Mohar
Executive
Nasihah Sakinah Halig
Executive
Norain Farhana Ahmad Fuaad
Executive
Syed Abdul Haliq Syed Abdul Malik
Executive
Afiah Nasuha Aznan
Executive
Alang Iskandar Alang Rejab
Executive
Norehan Kadir
Clerk

Science Communication Unit
Dharshene Rajayah
Head of Unit
Hazrul Liki
Executive (Publications)
Nazmi Lao
Executive (Writer)
Mohamad Haziq Rosli
Executive (Graphic Designer)
Syazwani Abu Bakar
Executive (Editor)
Mohd Najmie Mohd Yusoff
Executive (Multimedia Designer)
Shahridzal Aizat Shahrum
Executive
(Corporate Communication)
Muhammad Syafiq
Mohamad Shafiee
Assistant Executive
(Corporate Communication)

Corporate Services Division
Seetha Ramasamy
Manager

Human Resource Unit
Shaheran Abd Khedir
Executive
Nur Shafawaty Ahmad
Assistant Executive
Suhaila Sabri
Assistant Executive
Murni @ Zahani Ariffin
Clerk

Membership Unit
Norlina Hussin
Executive
Siti Noor Madiha Mansor
Executive
Musliha Asha'ari
Assistant Executive

Facility Management Unit
Norsuhada Adnan
Executive
Mohd Zairi Mansor
Senior Clerk
Rohani Mohd Yusop
Clerk
Rusli Othman
Assistant Operation
Muhammad Saiful Bahri Wan Din
Clerk
Khairul Nisak Alias
Receptionist
Mohd Zuhairi Zakbar
Driver
Mohd Azmy Abdul Rahman
Driver

Events & Logistic Unit
Natrah Rafiqah Mohd Jalil
Executive
Muhammad Zakwan
Shah Shahrudin
Assistant Executive
Mohd Zefri Mohd Zulkefli
Assistant Coordinator
Mohamad Fathorossoim
Al-Sani Abdullah Sani
Assistant Coordinator

Finance & Accounts Unit
Anis Adilla Mohd Arif
Senior Accountant
Nurul Ain Asyimah Mohammad
Accountant
Nur Idayu Abd Aziz
Assistant Accountant
Siti Maslinda Basiron
Assistant Accountant
Nurhani Zawani Posari
Assistant Accountant
Nor Hayati Johan
Clerk

IT Infrastructure & Support
Saiful Suhairi Suarni
Executive
Ahmad Khudri Abd Razak
Assistant Executive

Research Fellow
P. Loganathan

Research Assistants
Najihah Ismail
Siti Noor Syafiqah Ismail
Tengku Nor Amalina Raja Abd.llah
Nur Atiqah Ab Latif

Thank you to our team members who left us in 2018 :

• Nik Nur Aimi Syahirah • Mohd Arshad Abdullah Zawaiwi • Amirul Ikhzan Amin Zaki • Alia Samsudin • Nurul Afiqah Mohamed Hisham • Nur Adilah Rahim • Engku Sharmila Engku Abd Latif • Asna Asyraf Saedon • Muhammad Sulaimi Sulaiman • Rosmaniza Abd Rahman • Lydia Hong Wen Hin • Muhammad Syazwan Alauddin • Edzdiani Sharmeen Mohar • Nasihah Sakinah Mohd Halig • Shaheran Abd Khedir • Siti Noor Madiha Mansor • Rabiatuladawiyah Abdul Rahman • P. Loganathan • Najihah Ismail • Siti Noor Syafiqah Ismail • Tengku Nor Amalina Raja Ab.llah • Nur Atiqah Ab Latif • Nurul Nasuha Abd Hamid

INTERNATIONAL OFFICES HOSTED BY ASM

The International Council for Science Regional Office for Asia and the Pacific (ICSU ROAP)
Academician Professor Emerita Datuk Dr Mazlan Othman FASc
Director
Tengku Sharizad Tengku Chik
Senior Science Officer
Ahmad Sufyan Mohamed Aslam
Science Officer
Hannah Norazharuddin
Administrative Executive Officer
Nurul Farhana Mohd Farizah
Assistant Executive (Administrative)

The International Science, Technology and Innovation Centre Central for South-south Cooperation (ISTIC)
Dato Dr Samsudin Tugiman FASc
Chairman
Dato' Dr Sharifah Maimunah Syed Zin FASc
Director
Zarmila Salmi Sabot
Admin Officer
Abdul A'dzim Abd Rashid
Science Officer
Mohd Azim Noor
Information Technology Officer
Shareeza Shaari
Driver

ACRONYMS

AASSA - Association of Academies and Societies of Sciences in Asia
AI – Artificial Intelligence
ANCST – Asian Network on Climate Science and Technology
APEC – Asia-Pacific Economic Cooperation
APT JSO – ASEAN Plus Three Junior Science Odyssey
ASEAN – Association of Southeast Asian Nations
ASM – Academy of Sciences Malaysia
BNM – Bank Negara Malaysia
CCM – Chemical Company of Malaysia Berhad
CEMD – Confidential Enquiry into Maternal Deaths
CEP – Council of Eminent Persons
CERN – European Organisation for Nuclear Research
CEST MRI – Chemical Exchange Saturation Transfer Magnetic Resonance Imaging
CMS – Compact Muon Solenoid
COE – Centre of Excellence
CREST – Collaborative Research in Engineering, Science & Technology
CSM – CyberSecurity Malaysia
CYSC – China's Children & Youth Science Centre
DBAR – Digital Belt and Road
DESY – Deutsche Elektronen Synchrotron
DRR – Disaster Risk Reduction
EDLT – Electronic Distributed Ledger Technologies
ETP – Economic Transformation Programme
FASTREx – Future Acceleration through Science, Technology and Research Excellence
GTP – Government Transformation Programme
IBS – Industrial Building System
IBSE – Inquiry-based Science Education
ICoE – Industry Centres of Excellence
ICRRTP - Imbak Canyon Rainforest Research and Training Programme
ICSU – International Council for Sciences
IHL - Institution of Higher Learning
IIUM – International Islamic University Malaysia
IPCC – Intergovernmental Panel on Climate Change
IRDR – Integrated Research on Disaster Risk
ISC-ROAP – International Science Council Regional Office for the Asia Pacific
ISSC – International Social Science Council
ISTIC – International Science, Technology & Innovation Centre
KEK – High Energy Accelerator Research Organisation
MAMPU – Malaysian Administrative Modernisation and Management Planning Unit
MCMC – Malaysian Communications and Multimedia Commission
MDEC – Malaysian Digital Economy Corporation
MEA - Ministry of Economic Affairs
MESA Region – Middle East and South Asia Region
MESTECC – Ministry of Energy, Science, Technology, Environment and Climate Change
MiGHT – Malaysian Industry Government Group for Technology
MIT – Massachusetts Institute of Technology
MITI – Ministry of International Trade and Industry
MJM – Memorandum Jemaah Menteri
ML - Machine Learning
MOA – Ministry of Agriculture and Agro-based Industry
MOF - Ministry of Finance
MOFA - Ministry of Foreign Affairs
MOSTE – Ministry of Science, Technology and Environment
MOSTI – Ministry of Science, Technology and Innovation
MRU – Malaysia Research University
MTCP – Malaysian Technical Cooperation Programme
NADMA – National Disaster Management Agency
NanoMITE – Malaysia Institute for Innovative Nanotechnology
NEM – New Economic Model
NEPC – National Educational Policy Committee
NFCP – National Fibre Connectivity Plan
NJM – Nota Jemaah Menteri
NPSTI – National Policy on Science, Technology and Innovation
NSAM - National Seed Association Malaysia
NTU – National Taiwan University
NUOF – Newton-Ungku Omar Fund
OECD - Organisation for Economic Co-operation and Development
OGEE – Oil, Gas, Energy & Environment
PMT – Project Monitoring Team
PORIM - Palm Oil Research Institute of Malaysia
R, D & C – Research, Development and Commercialisation
RCR - Responsible Conduct of Research
RDC – Research, development and commercialization
SABRAO - Society for the Advancement of Breeding Research in Asia and Oceania
SDGs – Sustainable Development Goals
SEADPRI-UKM – Southeast Asia Disaster Prevention Research Initiative
SET – Science, engineering and technology
SIG – Special Interest Group
SME – Small and medium enterprises
STEM – Science, Technology, Engineering and Mathematics
STI – Science, technology and innovation
STIMP – STI Master Plan
SUPP – Sarawak United People's Party
TCA – Technology commercialization agency
TRSM – Top Research Scientists Malaysia
TVET – Technical and Vocational Education & Training
UiTM – Universiti Teknologi MARA
UK – United Kingdom
UKM – Universiti Kebangsaan Malaysia
UM - University of Malaya
UMS – Universiti Malaysia Sabah
UNESCAP – United Nations Economic and Social Commission for Asia and the Pacific
UNESCO - United Nations Educational, Scientific and Cultural Organization
UNISDR – United Nations Office for Disaster Risk Reduction
UNITEN – Universiti Tenaga Nasional
UNOSSC - United Nations Office for South-South Cooperation
UPM – Universiti Putra Malaysia
USA – United States of America
USM – Universiti Sains Malaysia
UTAR – Universiti Tunku Abdul Rahman
UTM – Universiti Teknologi Malaysia
UUM – Universiti Utara Malaysia
WHO – World Health Organisation
WWC – World Water Council
YSN-ASM – Young Scientists Network-Academy of Sciences Malaysia

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