AKADEMI SAINS MALAYSIA

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ANNUAL REPORT



In Pursuit of Excellence in Science

Pernyataan Misi

Mission Statement

……mencapai, menggalak, serta meningkatkan kecemerlangan dalam bidang sains, kejuruteraan dan teknologi khusus untuk kemajuan dan pembangunan Negara dan juga untuk kebaikan manusia sejagat.

…… the pursuit, encouragement and enhancement of excellence in the fields of science, engineering and technology for the development of the nation and the benefit of mankind.

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Laporan Presiden

President's Report



Tan Sri Datuk Dr Ahmad Zaharudin Idrus FASc
Presiden, Akademi Sains Malaysia
President, Academy of Sciences Malaysia

Saya dengan ini berbesar hati melaporkan aktiviti tahunan Akademi Sains Malaysia bagi tahun 2005. Di sini, anda akan dapat melihat bukti perkembangan aktiviti dan program yang dilaksanakan oleh Akademi. Tahun 2005 juga merupakan tahun yang istimewa kerana kita menyambut ulang tahun ke-10.

Sesungguhnya sambutan ulang tahun merupakan suatu yang bermakna untuk mengingati kembali nostalgia dan kenangan lampau. Ia merupakan satu pencapaian yang boleh dibanggakan pada waktu ini. Perjalanan Akademi Sains Malaysia bermula sejak awal 80-an apabila tercetusnya idea oleh saintis yang prihatin tetapi hanya pada bulan Ogos 1992, kertas cadangan bagi penubuhan Akademi Sains, Kejuruteraan dan Teknologi di Malaysia diserahkan kepada Majlis Kebangsaan bagi Penyelidikan dan Pembangunan (NCSRD) untuk pertimbangan.

I am pleased to report on the activities of the Academy of Sciences Malaysia for 2005. In this report of our programmes and activities, you will see evidence of the robust health of our Academy. The year 2005 was also a special year for us because it marked our 10th anniversary.

An anniversary, of course, is an appropriate occasion for nostalgia and a 'look back'. A critical appraisal of the accomplishments of this august body is an imperative at this juncture. The journey for the Academy of Sciences Malaysia began way back in the early eighties when the idea was first mooted by concerned scientists but it was only in August 1992, that the proposal for the establishment of an Academy of Science, Engineering and Technology of Malaysia was presented to the National Council of Research and Development (NCSRD) for its consideration.

Majlis telah bersetuju dengan saranan tersebut dan memutuskan bahawa Akademi mestilah merupakan badan bebas yang patut menjana hubungan erat dengan Kerajaan bagi memastikan keberkesanan rancangan dan aktiviti yang dijalankan. Kertas cadangan untuk membangunkan Akademi Sains Malaysia akhirnya diluluskan oleh Kabinet pada bulan November 1993. Kabinet juga meluluskan peruntukan pembiayaan sebanyak RM12.4 juta kepada Akademi. Kertas cadangan bagi Akademi Sains Malaysia telah dibentangkan oleh Menteri Sains, Teknologi dan Alam Sekitar pada sesi Parlimen Julai 1994 dan telah diluluskan oleh kedua-dua Parlimen. Oleh itu, Akademi Sains Malaysia mula dibangunkan di bawah Akta Akademi Sains 1994 dan mula dikuat kuasakan pada 1 Februari 1995.

The Council subsequently agreed to the recommendation that the Academy should be an independent body and that the Academy should establish strong linkages with the Government to ensure effective implementation of its plans and activities. The Bill to set up the Academy of Sciences Malaysia was finally approved by the Cabinet in November 1993 along with an endowment fund of RM12.4 million. The Academy of Sciences Malaysia Bill was tabled by the Minister of Science, Technology and the Environment during the July 1994 session of Parliament and was passed by both Houses of Parliament. The Academy of Sciences Malaysia was thus established under the Academy of Sciences Act 1994 which came into force on 1st February 1995.

Akademi Sains Malaysia telah melangkah jauh sejak penubuhannya sepuluh tahun yang lalu. Kerja keras serta usaha bersungguh-sungguh yang telah ditunjukkan selama ini menyebabkan Akademi Sains Malaysia dikenali, baik di dalam mahupun di luar negara. Walaupun perjalanan kita masih panjang berbanding dengan sesetengah Akademi terdahulu di serata dunia, namun sekiranya kita sentiasa membina asas yang kukuh sebagaimana yang telah dibangunkan oleh Akademi, kerjasama yang erat daripada Felo Kanan dan bersama Felo, kita akan mampu mencapai sesuatu yang luarbiasa untuk kepentingan sains di negara ini.

The Academy of Sciences Malaysia has indeed come a long way since its establishment ten years ago. The hard work and perseverance shown through the years have contributed to the recognition of the role of the Academy of Sciences Malaysia both on the national and international scenes. Admittedly, we have a long road ahead of us, compared with some of our sister Academies world-wide. But if we keep building on the strong foundation the Academy has established, coupled with enhanced contribution from all Senior Fellows and Fellows, we will be able to make great strides for the benefit of science in the country.

Berdasarkan tahun lepas, terdapat beberapa acara dan perlaksanaan program yang patut kita semua ketahui. Izinkan saya mulakan dengan Projek Rancangan Malaysia ke-Lapan (RMK8). Di bawah projek ini, Akademi telah menguruskan dua projek iaitu *National Nobel Laureate Programme* dan *Malaysian Antarctica Research Programme (MARP)*. Program Penyelidikan Antartika memberi peluang kepada para saintis kita membuat penyelidikan di Antartika dan mewujudkan kerjasama dengan negara-negara lain.

In reflecting on the past year, there are a number of events and achievements that are worthy of mention. Let me begin with Eighth Malaysia Plan (8MP) Projects where the Academy manages two projects, namely the National Nobel Laureate Programme and the Malaysian Antarctica Research Programme (MARP). The Antarctica Research Programme has given our scientists valuable opportunities to do research in Antarctica and to collaborate with other countries.

Acara kemuncak pada tahun 2005 bagi Program Noble Laureate adalah *Scientific Oration* dan *Science Motivation Session* oleh Prof Sydney Brenner, Nobel Laureate dalam Fisiologi atau Perubatan 2002. Antara kejayaan lain yang ditempa di bawah *National Nobel Laureate Programme* tahun ini adalah Program Lindau. Program Lindau membenarkan penyertaan saintis muda Malaysia dalam Pertemuan Tahunan Pemenang Hadiah Nobel dengan Saintis Muda di Lindau, German. Delegasi Malaysia yang menyertai Mesyuarat Lindau 2005 merupakan kumpulan kedua saintis muda Malaysia yang menyertai mesyuarat tersebut. Aktiviti lain yang sedang dilaksanakan di bawah Program Nobel Laureate adalah *Bilateral Collaboration* bersama dengan Institut Karolinska (KI), Sweden. Ia merupakan Pusat Kecemerlangan yang berprestij dan Pusat Penganugerahan Nobel dalam Fisiologi atau Perubatan. Aktiviti ini bertujuan untuk menjalinkan kerjasama dalam penyelidikan dan pembangunan perubatan, latihan profesional dan program pembelajaran ke peringkat PhD.

Bagi tahun 2005, MARP telah mencapai banyak peristiwa penting dalam bidang pembangunan keupayaan sumber manusia. Buat masa ini, terdapat tujuh orang calon PhD bekerja dalam pelbagai bidang berkaitan Biologi Antartik, atmosfera atasan interaksi Bumi-Matahari, dan cuaca dan iklim Antartika. Terdapat seramai 21 orang calon MSc di bawah program penyelidikan MARP yang bekerja dalam bidang biologi dan sains fizikal. Anggota MARP juga telah menerbitkan 47 kertas kerja di jurnal dan prosiding. Secara keseluruhannya, sebanyak 15 projek kajian telah diambil-alih di bawah MARP yangmelibatkan 40 orang penyelidik dari 7 buah universiti. Di antara pencapaian terbesar projek tersebut termasuklah kultur alga mikro, pembangunan teknologi bagi cerakin enzim dan penyiasatan rekabentuk gen serta penemuan spesis bakteria baru di Antartika. Sememangnya MARP secara tidak langsung dapat menyumbang kepada inisiatif dalam bidang bioteknologi melalui prospek bio dari Antartika dalam bentuk *extremophiles*.

The highlight of the 2005 Nobel Laureate Programme was a Scientific Oration and Science Motivation Session by Prof Sydney Brenner, Nobel Laureate in Physiology or Medicine 2002. Another successful activity under the National Nobel Laureate Programme was the Lindau Programme which provides for the participation of young Malaysian scientists in the Annual Meeting of Nobel Prize Winners with Young Scientists at Lindau, Germany. The Malaysian delegation that participated in the 2005 Lindau Meeting was the second batch of young Malaysian scientists who attended this meeting. Another ongoing activity under the Nobel Laureate Programme is the Bilateral Collaboration with Karolinska Institute (KI), Sweden, a prestigious Centre of Excellence and Nobel Awarding Centre in Physiology or Medicine which focuses on collaboration in medical research and development, and professional training and study programmes leading to PhD degrees.

For the year 2005, MARP achieved a number of milestones in the area of human resource capacity building. Currently, there are seven PhD candidates working on various fields dealing with Antarctic biology, the upper atmosphere, solar-terrestrial interactions, and the weather and climate of Antarctica. There are also 21 MSc candidates working in the fields of biology and physical sciences. MARP members have published 47 papers in refereed journals and proceedings. On the whole, there are currently 15 research projects being undertaken under MARP involving 40 researchers from seven universities. The major outcomes of the projects include microalgae culture, development of the technology of enzyme assay and gene probe design, as well as the discovery of new species of bacteria in Antarctica. Indeed MARP has contributed significantly to the national initiative on biotechnology through bio-prospecting in Antarctica in the form of extremophiles.

Menyediakan khidmat nasihat kepada Kerajaan mengenai perkara-perkara berkaitan sains, kejuruteraan dan teknologi merupakan tugas utama Akademi Sains Malaysia. Acara utama tahun ini merupakan Pengendalian Konvensyen Sains dan Teknologi Malaysia (MASTEC) 2005. MASTEC merupakan salah satu daripada acara penting Akademi di mana objektif utama adalah untuk mengadakan perundingan mengenai isu-isu terkini dalam pembangunan sains dan teknologi di Malaysia. Tema MASTEC pada tahun ini adalah *"Nurturing Effective Research Collaboration to Realise Innovation and Commercialisation for the Benefit of Society"* yang menyasarkan hubungan penyelidikan dan pembangunan di universiti dan institusi penyelidikan untuk memenuhi keperluan industri dan masyarakat. Ianya dijalankan dengan kerjasama *Malaysian Technology Development Corporation*. MASTEC 2005 telah menjana model yang berupaya memastikan kerjasama antara pemegang amanah seperti penyelidik, penggubal polisi, pengawal atur, pembiaya dan pasaran. Strategi untuk mengukuhkan kerjasama dan hubungan antara pihak yang relevan telah dikenalpasti. Kerjasama seperti ini mampu mengiatkan lagi pendidikan, pengendalian penyelidikan bagi penyelidik yang mempunyai minat yang sama dan penterjemahan keputusan penyelidikan agar kajian dan pembangunan saintifik yang relevan dapat memberi manfaat kepada masyarakat.

Providing independent advice to the Government on matters pertaining to science, engineering and technology has always been the major role of the Academy of Sciences Malaysia. The highlight this year is the organisation of the Malaysian Science and Technology Convention (MASTEC) 2005. MASTEC is one of the Academy's flagship events with the major objective being to deliberate on the latest issues on the development of science and technology in Malaysia. This year's MASTEC themed "Nurturing Effective Research Collaboration to Realise Innovation and Commercialisation for the Benefit of Society" was specially aimed at linking research and development in universities and research institutions to the needs of industry and society. It was organised in partnership with the Malaysian Technology Development Corporation. MASTEC 2005 has generated a model which would ensure close cooperation and collaboration between stakeholders namely researchers, policymakers, regulators, financiers and the market. Strategies to enhance cooperation and collaboration among all relevant parties were identified. Such partnerships will invigorate education, assist in conducting research of mutual interest and translate the results of research to benefit their society effectively as a means of sustaining the relevance of scientific research and development to society.

Dalam tempoh sebulan selepas kejadian tsunami pada 24 Disember 2004, sekumpulan penyelidik di bawah naungan Akademi menjalankan survey sosio-ekonomi, dan kajian impak fizikal dan kesan alam sekitar di kawasan yang terlibat. Hasil kajian telah diterbitkan. Akademi juga bekerjasama dalam mengendalikan Bengkel Kebangsaan bertajuk *"Tsunami and Earthquake Hazard Mitigation: Considerations for Malaysian Planning Design & Construction Practice."* Bengkel tersebut membincangkan dasar dan peraturan berkenaan bahaya gempabumi terhadap bangunan-bangunan di Malaysia.

Within a month after the 24 December 2004 tsunami event, a group of scientists under the auspices of the Academy undertook a socio-economic survey and physical and environmental impact study of the affected areas. The results of this study have been published. The Academy also co-organised a National Workshop on "Tsunami and Earthquake Hazard Mitigation: Considerations for Malaysian Planning Design & Construction Practice." The workshop, among others, discussed policies and regulations on earthquake hazard mitigation for buildings in Malaysia.

Sebagai sebahagian dari tugas memberi khidmat nasihat, Akademi terus mengorak langkah dalam menerajui pembaikan pendidikan Sains di negara ini di mana ia merupakan sesuatu yang relevan dan prasyarat untuk memastikan kejayaan berterusan pada masa akan datang. Saya percaya, kita tidak mampu mencipta inovasi baru dengan terbinanya industri-industri baru sekiranya jumlah saintis dan jurutera yang ada tidak mencukupi. Oleh sebab itu, Akademi Sains Malaysia sentiasa bekerja keras untuk meningkatkan pendidikan sains di negara kita bagi menarik minat generasi muda memilih bidang sains sebagai kerjaya mereka.

As part of its advisory role, the Academy continues to further the cause of better science education in the country since it is a subject which is close to our heart and a prerequisite for our continued success in the future. I believe that we cannot afford to lack the critical mass of scientists and engineers to create the next wave of innovations upon which the new industries will be built. The efforts of the Academy of Sciences Malaysia in working towards enhancing science education in our country is to attract more young people to choose science as a career.

Bagi menyerapkan budaya kecemerlangan dalam sains, Akademi Sains Malaysia telah melakar satu lagi sejarah dengan pelancaran "Anugerah Kecemerlangan Saintifik ASM Penghormatan Tun Dr. Mahathir Mohamad". Anugerah ini diberikan kepada penyelidik yang telah membuat perubahan besar yang diiktiraf di peringkat antarabangsa dan kepada penyelidik yang membuat perubahan positif terhadap masyarakat dalam bidang Perubatan Tropika, Pertanian Tropika, Senibina dan Kejuruteraan Tropika, dan Sumber Semulajadi Tropika. Tanggungjawab sekarang terletak pada Akademi, Felo dan juga rakan kerjasama bagi mengekalkan anugerah ini dan mencapai tahap tertinggi bagi memastikan anugerah tersebut diiktiraf di peringkat antarabangsa. Saya menyeru kerjasama dan sokongan anda semua untuk menjadikan anugerah ini sebagai salah satu daripada kemegahan antarabangsa. Pemenang pertama anugerah ini adalah Prof John Sheppard Mackenzie, *Curtin University of Technology,* Australia dalam bidang Perubatan Tropika.

In instilling the culture of excellence in science, the Academy of Sciences Malaysia has achieved another significant milestone with the launch of the Science Excellence Award in Honour of Tun Dr Mahathir Mohamad. This award is given to researchers who have made major breakthroughs that have gained international recognition and who have made positive impacts on society in the areas of Tropical Medicine, Tropical Agriculture, Tropical Architecture and Engineering and Tropical Natural Resources. The onus is now on the Academy and its Fellows as well as all partners to ensure that this award is sustained and that the highest standards are maintained in order for the award to gain international recognition. I would like to call upon the fullest support and contribution of all scientists in this country towards making this award one of international importance. The first recipient of this award was Prof John Sheppard Mackenzie, Curtin University of Technology, Australia, in the area of Tropical Medicine.

Pencapaian lain di bawah program Kecemerlangan Sains adalah mewujudkan *Science Advancement Research Fund* (SAGA) yang telah diberi peruntukan sebanyak RM20 juta oleh MOSTI untuk pembiayaan penyelidikan dan keutamaan diberikan kepada bidang sains asas. Objektif jangka pendek SAGA ialah untuk mempromosi dan memberi penekanan tentang peri pentingnya penyelidikan asas; menggalakkan kemajuan bagi penyelidikan

Another significant achievement under the Academy's Science Excellence programme was the establishment of the Scientific Advancement Research Fund (SAGA) that was given an allocation of RM20 million by MOSTI to fund research in priority areas of fundamental sciences. The short term objectives of SAGA are to promote and emphasise the importance of fundamental science research; encourage

sains asas; menjana keupayaan manusia dalam sains asas; dan meningkatkan kerjasama antara kumpulan penyelidik dalam bidang keutamaan negara. Kita mempunyai visi untuk mewujudkan sekumpulan saintis yang bertaraf antarabangsa dalam sains asas serta menubuhkan Pusat Kecemerlangan dalam penyelidikan asas dalam mengenalpasti bidang yang perlu diberi keutamaan. Sehingga kini, 61 projek telah dibiayai di bawah SAGA dengan jumlah peruntukan sebanyak RM15,757,570 dalam bidang Fizik, Kimia dan Fisiologi atau Perubatan. SAGA juga sedang mencari pembiayaan untuk projek penyelidikan *top-down* dan meluaskan bidang sains pada masa akan datang.

advancements in fundamental science research; develop human capital in fundamental sciences research; and enhance collaboration between research groups in priority areas in the country. It has a vision to build a pool of scientists of international standing in fundamental sciences and to create Centres of Excellence in fundamental research in identified priority areas. So far 61 projects are being funded under SAGA with a total amount of RM15,757,570 in the fields of Physics, Chemistry and Physiology or Medicine. SAGA is also looking into funding top-down research projects and expanding the fields of science in the future.

Program Kesedaran Sains merupakan satu lagi bidang teras Akademi yang sedang berkembang dan dipengaruhi oleh pelbagai aktiviti yang disediakan. Akademi telah mempromosikan kesedaran sivik tentang peri pentingnya sains, kejuruteraan dan teknologi dalam kehidupan seharian melalui penerbitan Estidoty, ceramah umum, Kuiz Sains Nasional dan pelbagai lagi. Keterangan lanjut mengenainya boleh didapati di dalam Laporan Tahunan ini. Contoh terbaik adalah kerjasama dengan sektor swasta iaitu program *Dumex National Science Quiz* untuk *Academy Science Malaysia's Challenge Trophy* dan *Intel-ASM Science Camps*.

The Science Awareness Programme is another of the Academy's thrust areas that has been growing in influence through various activities. The Academy has made a mark in promoting public awareness on the importance of science, engineering and technology in everyday life through the Estidotmy publication, various public lectures, the National Science Quiz and others that are elaborated further in the Annual Report. The Dumex National Science Quiz for the Academy of Sciences Malaysia's Challenge Trophy and Intel-ASM Science Camps are good examples of collaboration with the private sector towards achieving common goals for the benefit of mankind.

Program-program antarabangsa yang dianjurkan oleh Akademi kini semakin dikenali umum. Sebagai contoh, ASM telah berjaya membuat susulan pada Visi 1441 dalam konteks OIC dan sekarang sedang menyokong dan membantu MOSTI berkenaan pengoperasian Visi 1441 semenjak MOSTI menjadi pengerusi bagi Visi 1441 Pasukan Bertindak sehingga 2007. Dalam pada itu Mesyuarat Serantau ICSU pertama yang telah diadakan di Kuala Lumpur menyarankan agar pejabat serantau ICSU untuk Asia dan Pasifik ditubuhkan di Malaysia dan saranan ini telah dipersetujui oleh Kerajaan Malaysia. Sebagai sebahagian dari proses interaksi dan rangkaian dengan institusi serantau dan antarabangsa,

The international programme of the Academy is also steadily gaining more recognition. As an example, ASM has successfully followed up on the Vision 1441 in the context of the Organisation of Islamic Countries (OIC) and now supports and assists MOSTI towards operationalising Vision 1441 since MOSTI holds the Chair of the Vision 1441 Task Force until 2007. In addition, the first ICSU Regional meeting for Asia and the Pacific which held in Kuala Lumpur recommended the setting up of an ICSU regional office for Asia and the Pacific in Malaysia which was later approved by the Government of Malaysia. As part of the Academy's continuous process of interaction and networking with regional and international

Akademi terus mengorak langkah dengan menyertai secara aktif dalam aktiviti *Third World Academy of Sciences (TWAS), Inter Academy Panel(IAP), Inter Academy Council(IAC)* dan *ASEAN Academies*. Ini merupakan pembangunan yang akan meningkatkan tugas dan fungsi Akademi pada masa hadapan.

institutions, the Academy continues its active participation in the activities of the Third World Academy of Sciences (TWAS), Inter Academy Panel(IAP), Inter Academy Council(IAC) and ASEAN Academies. These are promising developments that stand to enhance ASM's roles and functions further.

Senario Sains, Kejuruteraan dan Teknologi dalam negara ini berubah dengan pantas. Justeru, perubahan ini sudah pasti mempunyai implikasi terhadap tanggungjawab dan fungsi Akademi yang kini dan akan datang. Akademi kini sedang menuju ke dekad baru dan sekarang tibalah masanya untuk kita meningkatkan fokus kepada kepimpinan strategik dalam STI di negara ini. Kita harus bayangkan sejauh mana keupayaan Akademi untuk menyahut cabaran Kerajaan bagi mewujudkan sebuah negara yang cemerlang, gemilang dan terbilang untuk diaplikasikan ke dalam pembangunan STI pada dekad akan datang. Selain dari itu, di sebalik perubahan nama dan penyusunan semula tugas Kementerian Sains, Teknologi dan Inovasi, Akademi harus menjajarkan keutamaan supaya kita akan menjadi lebih sistematik dan terarah dalam usaha mengorak langkah lebih jauh bagi memastikan tidak berlaku tindanan tugas dengan badan lain.

The Science, Engineering and Technology scene in the country is rapidly changing and these changes would surely have implications on the current and future roles and functions of the Academy. The Academy has now arrived at the threshold of another decade and it is time for the Academy to display a more focused and strategic leadership in STI in the country. We need to envision how the Academy can effectively translate the mandate given to it by the Government in forging excellence, glory and distinction for STI developments in the country in the next decade and beyond. Furthermore, in the light of the name change and the redefining of the roles for the Ministry of Science, Technology and Innovation, the Academy also needs to consider aligning its priorities so that we can be more structured and directed in the way we move forward so as not to duplicate the tasks of other parties.

Memandangkan Akademi Sains Malaysia merupakan badan yang penting dalam Sistem Inovasi National, kita mestilah mara sejajar dengan perubahan keperluan dalam usaha memainkan peranan sebagai penggerak kecemerlangan sains. Akademi mestilah futuristik dan relevan untuk memberi khidmat nasihat; dalam membangunkan pemikiran strategik; mewujudkan perikatan strategik dengan dunia perniagaan dan industri; memelihara rangkaian dan kerjasama kebangsaan dan antarabangsa; serta meneruskan kesinambungan sains, teknologi dan inovasi jauh ke hadapan.

Since the Academy of Sciences Malaysia is an integral part of the National Innovation System, we have to move in tandem with the required changes in order to play the roles of milestone movers and charters of scientific excellence. The Academy needs to be creatively futuristic and extremely relevant in giving advice; in developing strategic thinking among important players; in forging strategic alliances with business corporations and industries; in fostering networking and collaborations nationally and internationally; as well as pursuing continuous science, technology and innovation foresight.

Harapan pihak Kerajaan terhadap Akademi sebagai sebahagian dari *National Advisory System* dalam STI terlalu tinggi di mana ia merupakan salah satu

The Government's expectation of the Academy which is seen as part of the National Advisory System in STI is indeed very high and this is an

perkara yang harus diberi tumpuan lebih tinggi oleh Akademi. Saya amat yakin bahawa peranan ini patut diperkukuhkan dan difokuskan kerana ia memberi kesan kepada sumbangan Akademi, memandangkan kita mempunyai banyak kepakaran dan pengalaman yang dapat ditimba dari Felo. Bercakap mengenai tugas memberi khidmat nasihat, lazimnya terdapat pendekatan serampang dua mata yang boleh digunakan.

area in which the Academy has to strive harder as our advisory role has not been as forthcoming or visible. I strongly believe that this advisory role of the Academy should be further enhanced and focused upon as this would in many ways raise the stature and impact of the Academy's contribution, especially since we have a wide array of expertise and experience to draw on from among our Fellows. With regard to the advisory role, there is generally a two-pronged approach.

Pertama, Akademi akan menjana Laporan Nasihat dalam isu-isu tertentu dan apabila di minta oleh Kerajaan atau MOSTI atau Kementerian lain yang relevan dengan bidang teras ASM. Pendekatan kedua adalah untuk menjana Laporan Nasihat dengan proaktif berkaitan isu-isu penting pada negara yang relevan dengan tugas dan fungsi ASM, terutama dalam bidang yang memerlukan kepakaran Felo. Setakat ini, melalui pendekatan awal, ASM telah banyak memberi sumbangan dalam bidang khidmat nasihat kepada Kerajaan. Walau bagaimanapun, hanya sedikit sumbangan dapat dilihat apabila pendekatan baru diperkenalkan. Contoh terkini pendekatan awal adalah input ASM dalam program *Brain Gain* oleh MOSTI, penilaian IRPA, *ranking* aktiviti R&D di Malaysia dan sebagainya. Ia merupakan satu keperluan bagi Akademi untuk memenuhi tanggungjawab yang dipikul dengan sempurna di mana kepintaran Felo amat bermakna untuk kepentingan STI dalam masyarakat berbanding dengan teras lain. MOSTI juga berharap agar ASM akan lebih kehadapan dalam bidang ini sebagai bukti dalam menyediakan sokongan dan sumber. Saya tidak boleh terlalu menitikberatkan tentang peranan Akademi sebagai penasihat dan sumbangan Felo dalam Akademi kerana dalam banyak perkara, ASM perlu menunjukkan kehebatan, sejajar dengan harapan Kerajaan.

First, is to generate Advisory reports on certain issues as and when requested by the Government or MOSTI in particular, while not excluding other Ministries that are relevant to the thrust areas of ASM. The second approach is to generate Advisory Reports in a proactive manner on issues of national importance that are relevant to ASM's roles and functions, especially in areas where we have the required expertise among the Fellows. So far, ASM has been focusing on the former approach and very little has been undertaken as underlined by the latter approach. Some of the more recent examples of the former approach are ASM's input in the Brain Gain programme of MOSTI, the IRPA Evaluation and the ranking of R&D activities in Malaysia and so on. There is a great need for the Academy to fulfill this role effectively as it is the advisory role of the Academy that in many ways defines its stature and utilises the brainpower of the Fellows for the benefit of the STI in the nation as compared to other thrust areas. MOSTI is also seriously looking at ASM to be more forthcoming in this area as a justification to provide more support and resources. I cannot over-emphasise the advisory role of the Academy and the contribution of Fellows as it has to become ASM's forte, in line with the Government's expectations.

Saya sangat gembira dengan prospek Akademi yang akan menjadi salah satu agenda baru dalam aktiviti-aktiviti yang melibatkan sains, teknologi dan inovasi untuk menjadi cemerlang, gemilang dan terbilang. Dalam konteks ini, saya ingin

I am excited at the prospects for the Academy to be a part of the new leap of activities to take science, technology and innovation to the heights of excellence, glory and distinction. In this context, I wish to note that the Academy has established

menekankan bahawa Akademi telah menjalinkan kerjasama erat dengan Kementerian Sains, Teknologi dan Inovasi dan kerjasama ini mesti diperkukuhkan dan diteruskan pada masa akan datang. Oleh yang demikian, Akademi boleh menjadi pelengkap kepada tugas Kementerian berkaitan peningkatan dalam bidang Sains, Teknologi dan Inovasi di negara ini. Sebagai badan berkanun di bawah Kementerian Sains, Teknologi dan Inovasi, buat kali pertama pada tahun ini, Akademi telah menerima peruntukan dari Kementerian untuk membantu pengoperasian perbelanjaan tahunan Akademi. Akademi juga telah menyerahkan beberapa kertas cadangan di bawah peruntukan pembangunan di bawah Rancangan Malaysia ke-Sembilan.

an even closer rapport with the Ministry of Science, Technology and Innovation and this must continue to be strengthened so that the Academy can complement the role of the Ministry towards enhancing science, technology and innovation in the country. As a statutory body under the Ministry of Science, Technology and Innovation, the Academy, for the first time this year, received funding from the Ministry to assist the Academy in meeting part of its annual operating expenditure. The Academy also submitted several proposals under the development budget for the Ninth Malaysia Plan.

Memandangkan terdapat projek tambahan dan sumber kewangan baru yang akan datang, kita menjangkakan bahawa ASM akan mempunyai struktur baru yang lebih mantap. Sekarang ini, adalah sangat penting bagi ASM untuk memulakan perjalanan baru dengan paradigma baru untuk memainkan peranan yang lebih dinamik kepada pembangunan STI dalam negara ini. Kita perlu ingat bahawa Akademi mempunyai banyak peluang untuk memberi sumbangan kepada pembangunan sains dan teknologi dalam negara dengan berkesan dan ia bergantung kepada keupayaan Akademi untuk mengekalkan tahap tertinggi dalam apa jua lapangan, dan yang paling penting adalah kita dapat melihat dedikasi serta keberkesanan sumbangan Felo . Bagaimana kita berfungsi dan menyumbang ke arah pembangunan sains dan teknologi untuk negara dan dunia mesti menjadi testimoni kepada tugas kepimpinan kita bagi pihak sains dan masyarakat.

In view of the additional projects and resources that may come our way, we can expect ASM to have a new, expanded structure. It is now all the more imperative that ASM chart a new journey with a new paradigm to play a more dynamic role towards STI development in the country. We must continuously remind ourselves that the many opportunities for the Academy to contribute effectively to the development of science and technology in the country are dependent on the ability of the Academy to maintain the highest standards in everything that is carried out and more importantly the dedication as well as effective contribution of Fellows must be visible. The way we function and contribute to science and technology both in the country and globally must be a testimony to our leadership role on behalf of science and society.

Saya ingin mengambil kesempatan ini untuk merakamkan penghargaan kepada Kerajaan Malaysia, terutama YB Dato' Sri Jamaludin Jarjis, Menteri di Kementerian Sains, Teknologi dan Inovasi kerana memberi sokongan yang berterusan dan kepada Felo Akademi, terhadap sokongan yang tidak berbelah bagi dan kerjasama yang erat dari segi masa, pengetahuan dan pengalaman. Juga, ucapan terima kasih yang tulus ikhlas dan penghargaan kepada

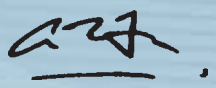
I would like to take this opportunity to express my deep gratitude to the Government of Malaysia, particularly the Honorable Minister Dato' Sri Jamaludin Jarjis the Ministry of Science, Technology and Innovation, for the continuous support and to the Fellows of the Academy for their enduring support and generous contribution in terms of time, knowledge and experience. Also a very sincere thank you and

semua kakitangan Akademi di atas ketekunan, komitmen dan dedikasi, serta kepada semua rakan-rakan di Akademi.

Sepanjang perjalanan lalu, Akademi Sains Malaysia telah membuat satu impak besar dan akan terus mengorak langkah pada tahun-tahun akan datang. Bermula di sini, saya melihat masa depan yang cerah buat Akademi. Laporan ini menggambarkan kejayaan yang telah kita capai. Kita juga mempunyai asas yang kukuh untuk mencapai dan mencipta banyak lagi kejayaan!.

appreciation to all staff of the Academy for their diligence, commitment and dedication and to all the friends of the Academy.

In an ever-widening range of ways, the Academy of Sciences Malaysia has made its impact - or surely will - as the years go on. From right here today, I see a great future for the Academy. This report illustrates what we have been able to accomplish, as well as the foundation upon which we are able to strive to do yet more.



Tan Sri Datuk Ahmad Zaharudin Idrus FASc
President, Academy of Sciences Malaysia

Fungsi ASM *Functions of ASM*

Menggalakkan dan merangsang pembangunan sains, kejuruteraan dan teknologi

Mengadakan forum pertukaran pendapat di kalangan ahli sains, jurutera dan ahli teknologi

Menggalakkan kesedaran, pemahaman dan penghargaan tentang negara peranan sains, kejuruteraan dan teknologi dalam kemajuan manusia

Menggalakkan daya ciptaan di kalangan ahli sains, jurutera dan ahli teknologi

Menggalakkan sifat berdikari negara dalam bidang sains, kejuruteraan dan teknologi

Bertindak sebagai forum bagi mengekalkan kesedaran di pihak Kerajaan akan pentingnya peranan sains, kejuruteraan dan teknologi dalam proses pembangunan negara dan membawa kepada perhatian ahli sains, jurutera dan ahli teknologi akan keperluan pembangunan negara

Menganalisa masalah-masalah tertentu negara dan mengenalpasti di mana sains, kejuruteraan dan teknologi dapat memberi sumbangan kepada penyelesaian masalah dengan membuat syor-syor kepada Kerajaan

Sentiasa mengambil perhatian tentang perkembangan sains, kejuruteraan dan teknologi serta mengenalpasti perkembangan yang relevan dengan keperluan negara dan membawa perkembangan tersebut untuk perhatian Kerajaan

Fungsi ASM *Functions of ASM*

To promote and foster the development of science, engineering and technology

To provide a forum for the inter-change of ideas among scientists, engineers and technologists

To promote national awareness, understanding and appreciation of the role of science, engineering and technology in human progress

To promote creativity among scientists, engineers and technologists

To promote national self-reliance in the field of science, engineering and technology

To act as a forum for maintaining awareness on the part of the Government of the significance of the role of science, engineering and technology in the development process of the nation and for bringing national development needs to the attention of scientists, engineers and technologists

To analyse particular national problems and identify where science, engineering and technology can contribute to their solution and accordingly to make recommendations to the Government

To keep in touch with developments in science, engineering and technology and identify those developments which are relevant to national needs and to bring such developments to the attention of the Government

Fungsi ASM *Functions of ASM*

Menyediakan laporan, kertas kerja atau dokumen lain berhubungan dengan dasar sains, kejuruteraan dan teknologi negara dan membuat syor-syor yang perlu kepada Kerajaan

Mengusahakan dan membiayai kajian pelbagai disiplin yang berkaitan serta keperluan pemahaman yang lebih mendalam tentang implikasi sosial dan ekonomi yang terbit dari sains, kejuruteraan dan teknologi

Menggalakkan penyelidikan dan pembangunan dan pendidikan serta latihan untuk tenaga manusia yang sesuai dalam bidang saintifik, kejuruteraan dan teknologi

Mengadakan dan mengekalkan hubungan antara Akademi dan badan-badan luar negeri yang mempunyai objektif yang hampir serupa dengan objektif Akademi

Memberi nasihat mengenai perkara yang berkaitan bidang sains, kejuruteraan dan teknologi sebagaimana yang diminta oleh Kerajaan dari semasa ke semasa

Melakukan tindakan lain yang konsisten dengan Akta Akademi Sains 1994 sebagaimana yang diperlukan untuk meningkatkan kemajuan sains, kejuruteraan dan teknologi di Malaysia dan kebajikan serta taraf Akademi

Fungsi ASM *Functions of ASM*

To prepare reports, papers or other documents relating to the national science, engineering and technology policy and make the necessary recommendations to the Government

To initiate and sponsor multi-disciplinary studies related to and necessary for the better understanding of the social and economic implications of science, engineering and technology

To encourage research and development and education and training of human resource in the appropriate scientific, engineering and technical fields

To establish and maintain relations between the Academy and overseas bodies having the same or almost similar objectives in science, engineering and technology as the Academy

To advise on matters related to science, engineering and technology as may be requested by the Government from time to time

To do such other acts which are consistent with 1994 Academy of Sciences Act as may be required in order to further the advancement of science, engineering and technology in Malaysia and the welfare and status of the Academy

Felo Kehormat *Honorary Fellow*



YAB DATO' SERI ABDULLAH AHMAD BADAWI,
PERDANA MENTERI MALAYSIA
YAB DATO' SERI ABDULLAH AHMAD BADAWI,
PRIME MINISTER OF MALAYSIA

Akademi Sains Malaysia dengan bangganya menganugerahkan Felo Kehormat Akademi Sains Malaysia kepada YAB Dato' Seri Abdullah Ahmad Badawi, Perdana Menteri Malaysia, bagi kepimpinan dan komitmen terhadap pembangunan Sains, Teknologi dan Inovasi di Malaysia ke arah menghasilkan ilmu pengetahuan baru dan menjana kekayaan untuk manfaat kepada masyarakat.

Cabaran ke-enam Wawasan 2020 telah menekankan objektif untuk mewujudkan masyarakat Malaysia yang saintifik dan progresif. Sains dan Teknologi telah dikenalpasti sebagai pemangkin untuk membawa pertumbuhan sosial-ekonomi Negara ke arah status Negara maju menjelang Tahun 2020. Teknologi baru diperlukan untuk meningkatkan produktiviti

The Academy of Sciences Malaysia is proud to confer the Honorary Fellowship of the Academy of Sciences Malaysia upon YAB Dato' Seri Abdullah Ahmad Badawi, the Prime Minister of Malaysia, for his distinguished leadership and commitment to the development of Malaysia's science, technology and innovation towards the generation of new knowledge and wealth creation for the benefit of society.

The sixth challenge of Vision 2020 has emphasised the objective to create a scientific and a progressive Malaysian society. Science and technology have been identified as the catalyst to drive the country's socio-economic growth towards a developed nation status by year 2020. Therefore the demand for science and technology is irrefutable as we need new

dan memaksimumkan kebekersanan industri di Malaysia, di mana akhirnya kita mampu untuk menjadi sebuah Negara yang lebih berdaya saing Dalam konteks ini, YAB Dato' Seri Abdullah Ahmad Badawi mencabar komuniti sains, teknologi dan inovasi Malaysia untuk berusaha meraih hasil dengan merangkumi rukun-rukun k-ekonomi.

technology to increase our productivity and maximise the efficiency of our industry and agriculture sectors. In this context, YAB Dato' Seri Abdullah Ahmad Badawi has consistently challenged Malaysian science, technology and innovation community to strive to be result-driven by embracing and internalising the tenets of a knowledge economy.

Semenjak menjadi Perdana Menteri, YAB Dato' Seri Abdullah Ahmad Badawi telah mengimplimentasikan langkah untuk menggabung dan mengemudi agenda Sains dan Teknologi melalui pucuk pimpinan yang cemerlang, gemilang dan terbilang. Beliau telah menggariskan isu asas dalam industri Sains dan Teknologi dan menggalakkan semua pihak berkepentingan untuk mara ke hadapan dengan cara yang lebih fokus, kohesif dan berkesan.

Since becoming the Prime Minister, YAB Dato' Seri Abdullah Ahmad Badawi has implemented measures to consolidate and steer Malaysia's science and technology agenda towards a path of excellence, glory and distinction. He addressed fundamental issues in the S&T industry and encouraged all stakeholders to move forward in a more focused, cohesive and effective manner.

Berdasarkan ukuran tersebut, Kementerian Sains dan Teknologi dan Alam Sekitar telah distruktur semula menjadi Kementerian Sains, Teknologi dan Inovasi. Oleh itu, semua agensi Sains dan Teknologi yang berkaitan dengan Kementerian dikendalikan semula di bawah skop satu kementerian yang menyediakan usaha bersepadu dalam agenda Sains dan Teknologi Negara. Untuk menggambarkan komitmen kerajaan dalam merealisasikan inovasi, Sains dan Teknologi yang lebih berkesan, YAB Dato' Seri Abdullah Ahmad Badawi telah membentuk Majlis Inovasi Kebangsaan yang dipengerusikan oleh beliau untuk merangka dan melaksanakan rancangan bagi sains, teknologi dan inovasi yang relevan dan praktikal. Input dari penggubal dasar, penyelidik, pemimpin industri dan akademik dari dalam dan luar Malaysia sangat bermanfaat untuk mencapai tujuan tersebut.

Central to these measures, was the restructuring of the Ministry of Science, Technology and Environment (MOSTI) to the Ministry of Science, Technology and Innovation. Following this move, all major S&T related agencies of the Government were reorganised under the purview of a single ministry providing for a more concerted effort in forging the S&T agenda of the country. To further demonstrate the Government's commitment to realise greater innovation and stronger S&T, YAB Dato' Seri Abdullah Ahmad Badawi has formed the National Innovation Council which he chairs, to formulate and execute plans for science, technology and innovation that are relevant and practical. Inputs from policiy-makers, researchers, industry stalwarts and academics from within and outside Malaysia are harnessed for these purposes.

Di bawah kepimpinan YAB Dato' Seri Abdullah Ahmad Badawi, Malaysia telah meningkatkan minat untuk membangunkan industri bioteknologi, industri yang merupakan salah

Under YAB Dato' Seri Abdullah Ahmad Badawi's leadership, Malaysia has increased its intent to develop the biotechnology industry, an industry hailed as one of the key drivers to propel the

satu dari penggerak untuk mendorong penghasilan ilmu pengetahuan dan inovasi, terutama dalam mencapai peringkat pembangunan yang mempunyai nilai-tambah yang tinggi. Semua ini termaktub dalam tinjauan dan pelancaran Dasar Bioteknologi Negara, yang mengenalpasti bidang seperti agro-bio, farmasutikal, nutrasutikel dan industri bioteknologi sebagai kunci utama untuk Malaysia. Polisi tersebut juga menetapkan insentif untuk penyelidikan dan juga industri. Selain itu, *Malaysian Biotechnolgy Corporation* juga dibangunkan untuk memberi kemudahan yang berkesan dalam pembangunan sektor bioteknologi di Malaysia.

creation of knowledge and innovation, particularly in achieving a higher value-added stage of development. This is encapsulated in the review and the launch of the National Biotechnology Policy, which identifies areas such as agro-bio, pharmaceuticals, nutraceuticals and industrial biotechnology as key areas for Malaysia. The Policy also specifies incentives for research as well as industry. Furthermore, the Malaysia Biotechnology Corporation was also established to effectively facilitate the development of Malaysia's biotechnology sector.

Sejajar dengan wawasan Malaysia untuk menjadi Negara yang berdaya-saing, YAB Dato' Seri Abdullah Ahmad Badawi telah memainkan peranan penting dalam memodenkan sektor pertanian kecil-kecilan melalui Sains dan Teknologi. Sejajar dengan ini, YAB Dato' Seri Abdullah Ahmad Badawi selalu menekankan perlunya mengubah dan mengukuhkan nilai pembentukan sektor pertanian melalui sains, teknologi dan inovasi. Limpahan dari pembentukan ini, akan terhasil aktiviti-aktiviti dan industri kecil dan sederhana lain. Akhirnya, kehidupan para petani akan dapat diperbaiki, di mana ia merupakan agenda penting dalam pentadbiran YAB Dato' Seri Abdullah Ahmad Badawi.

In line with Malaysia's vision of becoming a competitive nation, YAB Dato' Seri Abdullah Ahmad Badawi has placed great importance on the large-scale modernisation of the agriculture sector as well as modernising small scale farming through S&T. In line with this, YAB Dato' Abdullah Ahmad Badawi frequently emphasises the need to transform and enhance the value creation of the agricultural sector through science, technology and innovation. The spill over from this will lead to the creation of a host of downstream activities and other small-and-medium scale industries. Ultimately, the livehood of specific groups such as small scale farmers would be improved, which is an important agenda in YAB Dato' Seri Abdullah Ahmad Badawi's administration.

Aspek lain yang juga merupakan keunggulan YAB Dato' Seri Abdullah Ahmad Badawi adalah keupayaan pembangunan dalam bidang Sains dan Teknologi. Beliau telah memberi keutamaan dalam membangunkan modal intelektual dalam bentuk penyelidikan sains, kejuruteraan dan teknologi yang lebih berkelayakan, kompeten dan berteraskan industri. Dalam masa yang sama, mengenali perlunya kepakaran dalam Sains dan Teknologi untuk mendorong negara ke arah ekonomi, beliau telah memperkukuhkan program *Brain*

Another aspect championed by YAB Dato' Seri Abdullah Ahmad Badawi is capacity building in S&T areas. He has made it a priority to address the need to develop a pool of intellectual capital in the form of more qualified, competent and industry-driven researchers and practitioners of science, engineering and technology. At the same time, recognising Malaysia's current need for expertise in S&T to spearhead the country's foray into a knowledge-based economy, he has called for a comprehensive yet targeted "Brain

Gain" yang akan membawa Malaysia ke persada dunia dengan mensasar rakyat Malaysia yang berkerja di luar Negara atau bukan rakyat Malaysia, di mana ia memudahkan pemindahan ilmu pengetahuan dan kepakaran dalam Negara.

Gain Programme" that would allow Malaysia to tap into worldwide expertise, be it Malaysians working abroad or non-Malaysians, thereby facilitation a transfer of knowledge and expertise into the country.

Dalam arena antarabangsa, YAB Dato' Seri Abdullah Ahmad Badawi merupakan Pengerusi *Organization of Islamic Conference* (OIC) dan *Non-Aligned Movement* (NAM), beliau tidak pernah kecundang dalam menerajui Sains Dan Teknologi untuk pembangunan dan peningkatan taraf hidup untuk faedah komuniti global. YAB Dato' Seri Abdullah Ahmad Badawi selalu dipanggil untuk kerjasama memartabatkan sains dan teknologi, penyelidikan dan pembangunan dalam Negara-negara anggota sebagai laluan untuk pemodenan, pembangunan dan perkembangan Negara.

On the international front, YAB Dato' Seri Abdullah Ahmad Badawi as Chairman of the Organisation of Islamic Conference (OIC) and Non-Aligned Movement (NAM), has never failed to champion the cause of S&T for development and a better quality of life for the benefit of the global community. YAB Dato' Seri Abdullah Ahmad Badawi has often called for a commitment to elevate science and technology, research and development in member countries as a pathway to modernisation, development and progress.

Melalui pelbagai inisiatif dan polisi yang dilaksanakan di bawah pentadbiran beliau, YAB Dato' Seri Abdullah Ahmad Badawi menunjukkan bahawa Kerajaan telah memberikan komitmen yang padu untuk melihat ekonomi yang didorong ilmu dan prestasi muncul melalui kecemerlangan Sains dan Teknologi. YAB Dato' Seri Abdullah Ahmad Badawi merupakan simbol kepimpinan dan komitmen yang menghasilkan keputusan dengan menanamkan budaya kerja yang tinggi, integriti, bertanggungjawab dan pengurusan yang diperlukan untuk merealisasikan Wawasan 2020.

Through the various initiatives and policies implemented under his administration, YAB Dato' Seri Abdullah Ahmad Badawi's has demonstrated the Government's clear and firm commitment to see a knowledge-driven, performance-based economy emerge through excellence in S&T. YAB Dato' Seri Abdullah Ahmad Badawi is a committed leader who drives results by instilling a high performance culture, integrity, accountability and sound management that is needed more than ever towards the realisation of Vision 2020.

Akademi Sains Malaysia bersama-sama komuniti saintifik Malaysia menghormati kepimpinan dan komitmen yang diberikan dalam pembangunan sains, teknologi dan inovasi oleh YAB Dato' Seri Abdullah Ahmad Badawi dan dengan bangganya mengalu-alukan beliau sebagai Felo Kehormat ASM.

The Academy of Sciences Malaysia along with the Malaysian scientific community salutes the leadership and commitment towards the development of science, technology and innovation by YAB Dato' Seri Abdullah Ahmad Badawi and is proud to welcome him as Honorary Fellow.

Felo Kehormat *Honorary Fellow*



TUN DR MAHATHIR MOHAMAD
FELO KEHORMAT, AKADEMI SAINS MALAYSIA
TUN DR MAHATHIR MOHAMAD
HONORARY FELLOW, ACADEMY OF SCIENCES MALAYSIA

Penganugerahan Felo Kehormat kepada Tun Dr Mahathir Mohamad merupakan satu sejarah yang signifikan bagi Akademi Sains Malaysia. Tun Dr Mahathir Mohamad merupakan kekuatan utama di sebalik pembentukan Akademi dan merupakan seorang insan yang berkarisma serta menjadi inspirasi bagi kemajuan Sains dan Teknologi dalam Negara ini.

Tun Dr Mahathir Mohamad menjadikan pemikiran, membangun konsep dan perancangan sebagai kerjaya beliau. Lebih dari setengah abad, beliau telah banyak melahirkan hasrat, memberikan pandangan yang luas dan mencetuskan idea dan konsep dalam subjek dan minat yang luas. Walaupun idea-idea Tun Dr Mahathir Mohamad *singular* dalam sesetengah aspek, ia tidak terbatas dalam bidang tertentu sahaja. Kekayaan idea dan pemikiran merupakan *hallmark* beliau dan ia mencerminkan kehebatan pemikiran dan wawasan yang tiada tandingan. Sebagai seorang yang berlatarbelakangkan Sains, kehandalan

The conferment of Honorary Fellow upon Tun Dr Mahathir Mohamad is very significant in the history of the Academy of Sciences Malaysia. Tun Dr Mahathir Mohamad was the major force behind the formation of the Academy and the man who put into place much of the enabling mechanisms and is the inspiration for the advancement of Science and Technology in our country.

Tun Dr Mahathir has made thinking, conceptualising and planning his vocation. For over half a century he has been expressing his thoughts, expounding his views and articulating his ideas and concepts on a wide range of subjects and interests. Although Tun Dr. Mahathir's ideas are singular in one aspect, they are never stand-alones confined to a particular field. This rich inter-connectivity of ideas and thoughts has become his hallmark and speaks of his great mind and indomitable vision. As a man of science, his forte has been in bridging the paradigms of scientific thought with all other areas, be it nation building, politics or economics.

beliau telah menghubungkan paradigma pemikiran saintifik dengan semua bidang pembangunan Negara, termasuk politik dan ekonomi. Beliau telah menunjukkan kebolehan yang luar biasa dalam mengatasi kerumitan dalam pelbagai bidang untuk membawa Negara ke mercu kejayaan.

He has shown an outstanding ability to grasp the intricacies of various fields to steer the nation to the pinnacle of success.

Tun Dr Mahathir Mohamad tegas menyatakan bahawa Sains dan Teknologi merupakan peralatan yang penting untuk pembangunan Negara telah membawa beliau untuk memperjuangkan kemajuan Sains dan Teknologi di Malaysia dengan ketabahan dan matlamat. Hal ini dibuktikan apabila Tun Dr Mahathir memasukkan Sains dan Teknologi sebagai sebahagian penting daripada Rancangan Pembangunan Kerajaan mulai Rancangan Malaysia ke-Lima dan seterusnya. Beliau menunjukkan kebijaksanaan, pragmatisme dan berpandangan jauh dengan mengadaptasi idea baru dan lama untuk membentuk pembangunan Sains dan Teknologi dalam bentuk yang relevan dengan konteks negara. Hasilnya, kini Malaysia mempunyai struktur dan institusi-institusi yang setanding dengan mereka yang terdapat di negara-negara yang menerajui Sains dan Teknologi. Institusi pengajian tinggi, pusat penyelidikan, polisi sains, kumpulan pemikir, saintis dan ahli teknologi menjadi testimoni kepada usaha Tun Dr Mahathir untuk mengubah senario sains dan teknologi di Malaysia ke tahap antarabangsa.

Tun Dr. Mahathir's firm conviction that science and technology are essential tools for nation building has driven him to champion science and technology advancement in Malaysia with tenacity and purpose. This was well demonstrated when Tun Dr. Mahathir included science and technology as part of the Government's mainstream development planning from the Fifth Malaysia Plan onwards. He showed wisdom, pragmatism and foresight by adopting new and old ideas in moulding science and technology development in a manner relevant to the Malaysian context. As a result, today in Malaysia, we have the counterpart structures and institutions to those that exist in countries that are in the leading edge of Science and Technology. Malaysia's institutions of higher learning, research centres, science policy, think tank groups, scientists and technologists bear testimony to Tun Dr. Mahathir's efforts to transform the science and technology scenario of Malaysia to one that is of international standard.

Perkembangan dan kecemerlangan yang sebenarnya hanya akan dicapai apabila kita belajar untuk mengatasi halangan, sama ada besar mahupun kecil. Tun Dr Mahathir Mohamad telah cukup mendemonstrasikan semua ini sepanjang pembabitan beliau selama ini. Akademi Sains Malaysia dan komuniti saintifik di Negara ini harus mengikut jejak langkah beliau dalam semua usaha bermula kini dan akan datang.

True progress and true excellence are only achieved when we learn to surpass ourselves in all things, be it small or large. Tun Dr. Mahathir Mohamad has amply demonstrated this in all his undertakings. The Academy of Sciences Malaysia and the scientific community of this nation will do well to emulate this in all endeavours now and in the future.

Tun Dr Mahathir Mohamad dianggap sebagai ahli Motivasi, ahli Falsafah, ahli Pemikir, Penggubal wawasan dan Pejuang Sains dan Teknologi di Malaysia.

Tun Dr. Mahathir Mohamad is acknowledged as a Motivator, Philosopher, Thinker, Visionary & Champion of Science and Technology in Malaysia.

Felo Kanan *Senior Fellows*



Academician Professor Dr Looi Lai Meng FASc
New Senior Fellow appointed in 2005

1 **Academician Tan Sri Datuk Dr Haji Omar Abdul Rahman FASc** (1999)

2 **Academician Dato' Ir Lee Yee Cheong FASc** (1999)

3 **Academician Tan Sri Datuk Dr Augustine Ong Soon Hock FASc** (1999)

4 **Academician Dr M K Rajakumar FASc** (1999)

5 **Academician Tan Sri Dr B. C. Sekhar FASc** (2000)

6 **Academician Tan Sri Dato' Dr Mohd Rashdan Haji Baba FASc** (2001)

7 **Academician Dr Yong Hoi Sen FASc** (2002)

8 **Academician Tan Sri Dato' Seri Ir (Dr) Shamsuddin Abdul Kadir FASc** (2002)

9 **Academician Tan Sri Ir (Dr) J G Daniel FASc** (2003)

10 **Academician Datuk Dr Salleh Mohd Nor FASc** (2004)

Felo Baru *New Fellows*



YB Dato' Sri Dr Jamaludin Mohd Jarjis FASc



Professor Dr Kurunathan Ratnavelu FASc



Professor Dr Sukiman Sarmani FASc



Professor Dr Radin Umar bin Radin Sohadi FASc



Professor Dato' Dr Khalid Yusoff FASc



Professor Dr Tou Teck Yong FASc



Dato' Ir Lai Pin Yong FASc

Senarai Felo *List of Fellows*

Sains Perubatan / *Medical Sciences*

1 Academician Dr M. K. Rajakumar FASc
2 Academician Professor Dr Looi Lai Meng FASc.
3 Tan Sri Dato' Seri Dr Haji Abdul Majid Ismail FASc
4 Professor Dr Mak Joon Wah FASc
5 Dato' Dr Lim Kee Jin FASc
6 Datuk Dr Hussein Awang FASc
7 Professor Emeritus Dato' Dr Khalid B Abdul Kadir FASc
8 Datuk Dr M. Jegathesan FASc
9 Datuk Dr G. Sreenevasan FASc
10 Tan Sri Dato' Dr Yahya Awang FASc
11 Datuk Dr Keshmahinder Singh FASc
12 Tan Sri Dato' Dr Abu Bakar Dato' Suleiman FASc
13 Professor Emeritus Dato' Dr Lam Sai Kit FASc
14 Tan Sri Dato' Seri Haji Musa Mohamad FASc
15 Professor Dato' Paduka Dr Mustaffa Embong FASc
16 Professor Puan Sri Datin Dr Nafisah Hj Nik Mohd Adeeb FASc
17 Kdr Professor Dato' Dr Hashim Bin Yaacob FASc
18 Professor Dr Yap Sook Fan FASc
19 Professor Dr Cheong Soon-Keng FASc
20 Professor Dato' Dr Khairul Anuar Abdullah FASc
21 Professor Dato' Dr C.P. Ramachandran FASc
22 Professor Dr Asma Ismail FASc
23 Professor Dato' Dr Anuar Zaini Md Zain FASc
24 Professor Dr Victor Lim Kok Eow @ Azman Lim FASc
25 Professor Dato' Dr Khalid Yusoff FASc

Senarai Felo *List of Fellows*

Sains Kejuruteraan / *Engineering Sciences*

1 Academician Tan Sri Ir J.G. Daniel FASc
2 Academician Dato' Ir Lee Yee Cheong FASc
3 Tan Sri Dato' Ir Abu Zarim Haji Omar FASc
4 Tan Sri Dato' Ir Haji Shahrizaila Abdullah FASc
5 Dato' Dr Muhammad Ridzuan Haji Salleh FASc
6 Dato' Ikmal Hisham Al-Bakri FASc
7 Tan Sri Dato' Ir Muhammad Yusuff Muhammad Yunus FASc
8 Encik Hijjas Kasturi FASc
9 Datuk Ir Hj Ahmad Zaidee Laidin FASc
10 Dato' Dr Mohd Ariffin Hj Aton FASc
11 Dr Ting Wen Hui FASc
12 Ir Hong Lee Pee FASc
13 Dato' Dr Abu Bakar Jaafar FASc
14 Professor Dato' Wira Ir Dr Mohammad Noor Hj Salleh FASc
15 Professor Ir Abang Abdullah Abang Ali FASc
16 Dato' Professor Ir Dr Sahol Hamid Abu Bakar FASc
17 Professor Dr Mohd Ali Hashim FASc
18 Dr Ma Ah Ngan FASc
19 Professor Dato' Dr Goh Sing Yau FASc
20 YB Dato' Sri Dr Jamaludin Mohd Jarjis FASc
21 Professor Dr Radin Umar bin Radin Sohadi FASc

Senarai Felo *List of Fellows*

Sains Biologi / *Biological Sciences*

1 Academician Dr Yong Hoi Sen FASc
2 Academician Datuk Dr Salleh B Mohd Nor FASc
3 Professor Emeritus Dr Abdul Latif Ibrahim FASc
4 Professor Emeritus Dato' Dr Ahmad Nawawi HjAyob FASc
5 Professor Emeritus Tan Sri Dato' Dr Syed Jalaluddin Syed Salim FASc
6 Tan Sri Datuk Dr Ahmad Zaharudin Idrus FASc
7 Professor Dato' Dr Zakri Abdul Hamid FASc
8 Tan Sri Dato' Dr Ahmad Mustaffa Babjee FASc
9 Professor Emeritus Dr Chin Hoong Fong FASc
10 Dr Francis S.P. Ng FASc
11 Professor Dr Mak Chai @ Mak Lian Fong FASc
12 Professor Dr Ho Yin Wan FASc
13 Associate Professor Dr Koh Chong Lek FASc
14 Professor Emeritus Dr Mohd Nordin Hj Hassan FASc
15 Dr Rajanaidu Nookiah FASc
16 Professor Dato' Dr Sheikh Omar Abdul Rahman FASc
17 Professor Dr Muhamad Awang FASc
18 Professor Dato' Dr Mohamed Mahyuddin Mohd Dahan FASc
19 Dr Yeang Hoong Yeat FASc
20 Professor Dato' Dr Abdul Latif Mohamad FASc
21 Professor Dr Ghazally Ismail FASc
22 Professor Dr Mohamed Abdul Majid FASc
23 Professor Dr Helen Nair FASc

Senarai Felo *List of Fellows*

Matematik dan Sains Fizikal / *Mathematical and Physical Sciences*

1 Dato' Dr Chatar Singh FASc
2 Tan Sri Datuk Dr Ahmad Tajuddin Ali FASc
3 Professor Emaritius Dato' Dr Sham Sani FASc
4 Professor Datuk Dr R Ratnalingam FASc
5 Datuk Fateh Chand FASc
6 Professor Dr Shaharir Mohamed Zain FASc
7 Dr Chia Swee Ping FASc
8 Dr Fon Wai Chu FASc
9 Professor Dr Hassan Said FASc
10 Professor Dato' Ir Dr Chuah Hean Teik FASc
11 Professor Dr Ibrahim Komoo FASc
12 Professor Dr Bahrom Sanugi FASc
13 Professor Dr Harith Ahmad FASc
14 Professor Dr Kurunathan Ratnavelu FASc
15 Professor Dr Tou Teck Yong FASc

Senarai Felo *List of Fellows*

Sains Kimia / *Chemical Sciences*

1 Academician Tan Sri Datuk Dr Augustine Ong Soon Hock FASc
2 Academician Tan Sri Dr B C Sekhar FASc
3 Dr Haji Badri Muhamad FASc
4 Professor Dato' Dr V G Kumar Das FASc
5 Professor Emeritus Dr Ng Soon FASc
6 Professor Dr Ho Chee Cheong FASc
7 Datuk Dr Mohinder Singh Sucha Singh FASc
8 Dr Goh Swee Hock FASc
9 Professor Dr Halimaton Hamdan FASc
10 Professor Dato' Dr Md Ikram Mohd Said FASc
11 Professor Dr Lee Chnoong Kheng FASc
12 Professor Dr Sukiman Sarmani FASc

Teknologi Maklumat / *Information Technology*

1 Academician Tan Sri Dato' Seri Ir Shamsuddin Abdul Kadir FASc
2 Tg Datuk Dr Mohd Azzman Shariffadeen Tg Ibrahim FASc
3 Dato' Ir Dr Mohamad Zawawi Ismail FASc
4 Professor Emeritus Dato' Dr Tan Wang Seng FASc
5 Datuk Dr Mohamed Ariff Nun FASc
6 Dr Mohamad Awang Lah FASc
7 Dr Mohamad Zahran Dato' Sheikh Abdul Halim FASc
8 Professor Dr Zaharin Yusoff FASc
9 Dato' Professor Dr Ir Zainul Abidin Md Shariff FASc
10 Professor Dato' Dr Ir Mashkuri Hj Yaacob FASc

Senarai Felo *List of Fellows*

Pembangunan Sains & Teknologi dan Industri / *Science & Technology Development and Industry*

1 Academician Tan Sri Datuk Dr Haji Omar Abdul Rahman FASc
2 Academician Tan Sri Dato' Dr Mohd Rashdan Haji Baba FASc
3 Tan Sri Dato' Haji Ani Arope FASc
4 Tan Sri Dato' Dr Mohamed Yusof Hashim FASc
5 Tan Sri Dato' Ir Wan A. Rahman Yaacob FASc
6 Datuk Dr Abdul Aziz Sheikh Abdul Kadir FASc
7 Datuk Yong Poh Kon FASc
8 Mr T Ananda Krishnan FASc
9 Tan Sri Datuk Dr Yusuf Basiron FASc
10 Datuk Alladin Hashim FASc
11 Professor Datuk Dr Mazlan Othman FASc
12 Haji Ir Mohamed Zohari Mohamed Shaharun FASc
13 Datuk Dr Saharan Hj Anang FASc
14 Dato' Dr Ong Eng Long FASc
15 Professor Dr Jalani Sukaimi FASc
16 Professor Dr Khalijah Mohd Salleh FASc
17 Dr Chan Kook Weng FASc
18 Dato' Dr Abdul Razak Mohd Ali FASc
19 Dato' Ir Lai Pin Yong FASc

Ahli Majlis *Council Members*

Presiden / *President* :

Tan Sri Datuk Dr Ahmad Zaharudin Idrus FASc

Naib Presiden / *Vice-President* :

Academician Datuk Dr Salleh Mohd Nor FASc

Setiausaha Agung / *Secretary General* :

Professor Datuk Dr Mazlan Othman FASc

Bendahari Kehormat / *Honorary Treasurer* :

Datuk Ir Hj Ahmad Zaidee Hj Laidin FASc

Ahli Majlis/ *Council Members*:

Datuk Dr Abdul Aziz Sheikh Abdul Kadir FASc

Professor Dr Ho Chee Cheong FASc

Datuk Dr M. Jegathesan FASc

Dato' Dr Ong Eng Long FASc

Dato' Dr Abu Bakar Jaafar FASc

Professor Emeritus Tan Sri Dato' Dr Syed Jalaluddin Syed Salim FASc

Professor Emeritus Dr Mohd Nordin Hj Hassan FASc

Tan Sri Datuk Dr Yusuf Basiron FASc

Dr Chia Swee Ping FASc

Dato' Ir Dr Mohamad Zawawi Ismail FASc

Academician Professor Dr Looi Lai Meng FASc

Academician Tan Sri Datuk Dr Augustine Ong Soon Hock FASc

Mesyuarat Majlis *Council Meetings*

Bagi tahun berakhir pada 31 Disember 2005 Majlis telah bermesyuarat enam (6) kali seperti berikut:

- 26 Februari 2005
  Mesyuarat Majlis ke -59
- 8 April 2005
  Mesyuarat Majlis ke- 60
- 28 Mei 2005
  Mesyuarat Majlis ke -61
- 30 Julai 2005
  Mesyuarat Majlis ke- 62
- 28 September 2005
  Mesyuarat Majlis ke-63
- 26 November 2005
  Mesyuarat Majlis ke -64

Pada mesyuarat ini, Majlis antara lain, telah membincangkan isu-isu berikut:

- Kajian Semula Belanjawan 2004 dan Belanjawan 2005
- Projek-projek di bawah Rancangan Malaysia ke Lapan
  - Program Nobel Laureate Kebangsaan
  - Program Penyelidikan Antartika Malaysia
- Program dan Aktiviti ASM

For the year ending 31 December 2005, the Council met six (6) times as follows:

- *26 February 2005*
  59 Council Meeting
- *8 April 2005*
  60 Council Meeting
- *28 May 2005*
  61 Council Meeting
- *30 July 2005*
  62 Council Meeting
- *28 September 2005*
  63 Council Meeting
- *26 November 2005*
  64 Council Meeting

At these meetings, the Council deliberated on the following issues:

- *2004 Budget Review and 2005 Budget*
- *Projects under the Eighth Malaysia Plan*
  - *National Nobel Laureate Programme*
  - *Malaysian Antarctica Research Programme*
- *ASM Programmes and Activities*

Mesyuarat Agung Tahunan Kesepuluh

10th Annual General Meeting

Akademi Sains Malaysia telah mengadakan Mesyuarat Agung Tahunan kesepuluh pada 30 April 2005 di Bilik Gerakan MACRES dan dipengerusikan oleh Presiden, Tan Sri Datuk Dr. Ahmad Zaharuddin Idrus FASc. Empat puluh enam Felo menghadiri Mesyuarat Agung tersebut. Presiden Akademi menyampaikan ucapan alu-aluan dan berterima-kasih atas sokongan yang diberikan.

The Academy of Sciences Malaysia held its 10th Annual General Meeting on 30 April 2005 at the MACRES Operation Room with the President, Tan Sri Datuk Dr. Ahmad Zaharuddin Idrus FASc in the Chair. Forty-six Fellows attended the AGM. The President of the Academy presented his welcome address and thanked members for their support.

Pengerusi mengumumkan bahawa Perdana Menteri Malaysia, YAB Dato' Seri Abdullah Ahmad Badawi sebagai Felo Kehormat Akademi Sains Malaysia.

The Chairman announced that the Honourable Prime Minister Dato' Seri Abdullah Ahmad Badawi was to be conferred Honorary Fellowship of the Academy of Sciences Malaysia.

Mesyuarat membincangkan dan meluluskan perkara-perkara berikut:

- Laporan Tahunan 2004 dan Penyata Kewangan Berakhir 31 Disember 2004.
- Pemilihan tujuh orang Felo baru Akademi Sains Malaysia seperti berikut:

The meeting discussed and approved the following:

- *2004 Annual Report and Statement of Accounts ending 31 December 2004.*
- *Election of seven new Fellows of the Academy as follow:*

  - Prof Dato' Dr Khalid Yusoff – Sains Perubatan / *Medical Sciences*
  - Prof Dr Radin Umar Radin Sohadi – Sains Kejuruteraan /*Engineering Sciences*
  - Dato' Sri Dr Jamaluddin Mohd Jarjis – Sains Kejuruteraan /*Engineering Sciences*
  - Prof Dr Tou Teck Yong – Sains Matematik dan Fizik /*Mathematical and Physical Sciences*
  - Prof Dr Kurunathan Ratavellu – Sains Matematik dan Fizik / *Mathematical and Physical Sciences*
  - Prof Dr Sukiman Samarni – Sains Kimia / *Chemical Sciences*
  - Dato' Ir Lai Pin Yong – Pembangunan S&T dan Industri / *S&T Development and Industry*

- Perlantikan Ahli Majlis / *Election of Council Members :*

  - Academician Datuk Dr Salleh Mohd Noor FASc – Naib Presiden / *Vice President*
  - Prof Datuk Dr Mazlan Othman FASc – Setiausaha Agung / *Secretary General*
  - Datuk Ir Dr Ahmad Zaidee Laidin – Bendahari Kehormat / *Honorary Treasurer*
  - Dato' Dr Abdul Aziz Kadir FASc – Ahli Majlis / *Council Member*
  - Datuk Dr M.Jegathesan FASc – Ahli Majlis / *Council Member*
  - Dato' Dr Ong Eng Long – Ahli Majlis / *Council Member*
  - Academician Tan Sri Datuk Dr Augustine S.H. Ong FASc – Ahli Majlis / *Council Member*
  - Prof Dato' Ir Dr Mohamad Zawawi Ismail FASc – Ahli Majlis / *Council Member*
  - Academician Prof Dr Looi Lai Meng FASc – Ahli Majlis / *Council Member*

Pengerusi memberitahu bahawa Majlis ASM bersetuju memilih Prof Looi Lai Meng FASc sebagai Felo Kanan baru. Perlantikan dicadangkan oleh Panel Khas yang dipengerusikan oleh Tan Sri Datuk Halim Ali.

The Chairman informed that the ASM Council had agreed to appoint Prof Dr Looi Lai Meng FASc as the new Senior Fellow. The appointment was recommended by the Special Panel which was chaired by Tan Sri Datuk Halim Ali.

Jawatankuasa Kerja dan Pasukan Bertindak

Working Committees and Task Force

Untuk membantu pentadbiran dan operasi Akademi, Majlis telah menubuhkan beberapa Jawatankuasa dan Pasukan Bertindak yang bertanggungjawab untuk menjalankan beberapa fungsi dan tanggungjawab. Dalam tahun 2005 senarai Jawatankuasa adalah seperti berikut:

To assist in the management and operation of the Academy, the Council has set up various committees and task force to carry out specific functions and responsibilities. In 2005, the following committees were established:

JAWATANKUASA EKSEKUTIF/ *EXECUTIVE COMMITTEE*

Presiden/*President*
Tan Sri Datuk Dr Ahmad Zaharudin Idrus FASc

Naib Presiden/*Vice President*
Academician Datuk Dr Salleh Mohd Nor FASc

Setiausaha Agung/*Secretary General*
Professor Datuk Dr Mazlan Othman FASc

Bendahari Kehormat/*Honorary Treasurer*
Datuk Ir Ahmad Zaidee Laidin FASc

PENGERUSI KUMPULAN DISIPLIN/ *CHAIRMAN DISCIPLINE GROUPS*

Sains Perubatan/*Medical Sciences*
Datuk Dr M. Jegathesan FASc

Sains Biologi/*Biological Sciences*
Professor Emeritus Dr Nordin Hj Hassan FASc

Sains Kejuruteraan/*Engineering Sciences*
Datuk Dr Ahmad Zaidee Laidin FASc

Sains Matematik & Fizik/*Mathematical and Physical Sciences*
Dr Chia Swee Ping FASc

Sains Kimia/*Chemical Sciences*
Professor Dr Ho Chee Cheong FASc

Jawatankuasa Kerja dan Pasukan Bertindak

Working Committees and Task Force

Teknologi Maklumat/*Information Technology*
Dato' Dr Ahmad Zawawi Ismail FASc

Pembangunan dan Industri S&T/*S&T Development and Industry*
Dato' Dr Abdul Aziz S.A Kadir FASc

JAWATANKUASA KEWANGAN / *FINANCE COMMITTEE*

Pengerusi/*Chairman*
Dato' Ir Ahmad Zaidee Laidin FASc

JAWATANKUASA KEAHLIAN / *MEMBERSHIP COMMITTEE*

Pengerusi/*Chairman*
Academician Datuk Dr Salleh Mohd Nor FASc

JAWATANKUASA NASIHAT KEPADA KERAJAAN / *ADVICE TO GOVERNMENT COMMITTEE*

Pengerusi/*Chairman*
Tan Sri Datuk Dr Ahmad Zaharudin Idrus FASc

JAWATANKUASA HAL EHWAL ANTARABANGSA / *INTERNATIONAL AFFAIRS COMMITTEE*

Pengerusi/*Chairman*
Academician Datuk Dr Salleh Mohd Nor FASc

JAWATANKUASA PERJAWATAN / *ESTABLISHMENT COMMITTEE*

Pengerusi/*Chairman*
Professor Datuk Dr Mazlan Othman FASc

JAWATANKUASA PENCALONAN AHLI/
MEMBERSHIP NOMINATION COMMITTEE

Pengerusi/*Chairman*
Professor Datuk Dr Mazlan Othman FASc

JAWATANKUASA KUIZ SAINS DAN PROJEK SAINS KEBANGSAAN /
NATIONAL SCIENCE QUIZ & PROJECTS COMMITTEE

Pengerusi/*Chairman*
Datuk Dr Abdul Aziz S.A. Kadir FASc

JAWATANKUASA BUDAYA KECEMERLANGAN /
CULTURE OF EXCELLENCE COMMITTEE

Pengerusi/*Chairman*
Academician Datuk Dr Salleh Mohd Nor FASc

JAWATANKUASA PENDIDIKAN SAINS DAN TEKNOLOGI /
SCIENCE AND TECHNOLOGY EDUCATION COMMITTEE

Pengerusi/*Chairman*
Professor Dr Khalijah Salleh FASc

JAWATANKUASA PEMANDU DANA SAGA /
COMMITTEE OF STEERING SAGA FUND

Pengerusi/*Chairman*
Professor Datuk Dr Mazlan Othman FASc

JAWATANKUASA PENERBITAN /
PUBLICATIONS COMMITTEE

Pengerusi/*Chairman*
Dato' Dr Zawawi Ismail FASc

Jawatankuasa Kerja dan Pasukan Bertindak

Working Committees and Task Force

JAWATANKUASA TABUNG AMANAH DR RANJEET BHAGWAN SINGH /
DR RANJEET BHAGWAN SINGH TRUST FUND COMMITTEE

Pengerusi/*Chairman*
Academician Prof Dr Looi Lai Meng FASc

JAWATANKUASA BANGUNAN ASM /
ASM BUILDING COMMITTEE

Pengerusi/*Chairman*
Academician Dato' Ir Lee Yee Cheong FASc

JAWATANKUASA ANUGERAH KECEMERLANGAN SAINTIFIK ASM PENGHORMATAN TUN DR MAHATHIR MOHAMAD/
ASM AWARD FOR SCIENTIFIC EXCELLENCE IN HONOUR OF TUN DR MAHATHIR MOHAMAD COMMITTEE

Pengerusi/*Chairman*
Professor Datuk Dr Mazlan Othman FASc

JAWATANKUASA *'RANKING RESEARCH PROGRAM'*
RANKING RESEARCH PROGRAMME COMMITTEE

Pengerusi/*Chairman*
Prof Datuk Dr Mazlan Othman FASc

PASUKAN BERTINDAK AKADEMI SAINS MALAYSIA/
TASK FORCE OF ACADEMY OF SCIENCES MALAYSIA

Pasukan Bertindak Program Kesedaran S&T/
Task Force on S&T Awareness

Pengerusi/*Chairman*
Professor Dr Ho Chee Cheong FASc

Pasukan Bertindak Penyelidikan & Pembangunan Malaysia di Antartika/
Task Force on Malaysian Research & Development in Antarctic

Pengerusi/*Chairman*
Academician Datuk Dr Salleh Mohd Nor FASc

Pasukan Bertindak Pembangunan Lestari dan Ekspedisi/
Task Force on Sustainable Development and Expeditions

Pengerusi/*Chairman*
Professor Dr Ibrahim Komoo FASc

Pasukan Bertindak Penilaian IRPA – EAR
Task Force on IRPA Evaluation – EAR

Pengerusi/*Chairman*
Professor Emeritus Dr Nordin Hj Hassan FASc

Wakil ASM di Mesyuarat peringkat Kebangsaan dan Antarabangsa/
ASM Representatives at National and International Meetings

MPKSN
Professor Datuk Dr Mazlan Othman FASc (Setiausaha Agung/Secretary General)

IAC
Academician Datuk Dr Salleh Mohd Nor FASc

International Council for Science (ICSU)
Professor Dr Muhamad Awang FASc

Science Council of Asia (SCA)
Professor Emeritus Dr Nordin Hj Hasan FASc

COMSTECH – NASIC
Academician Datuk Dr Salleh Mohd Nor FASc

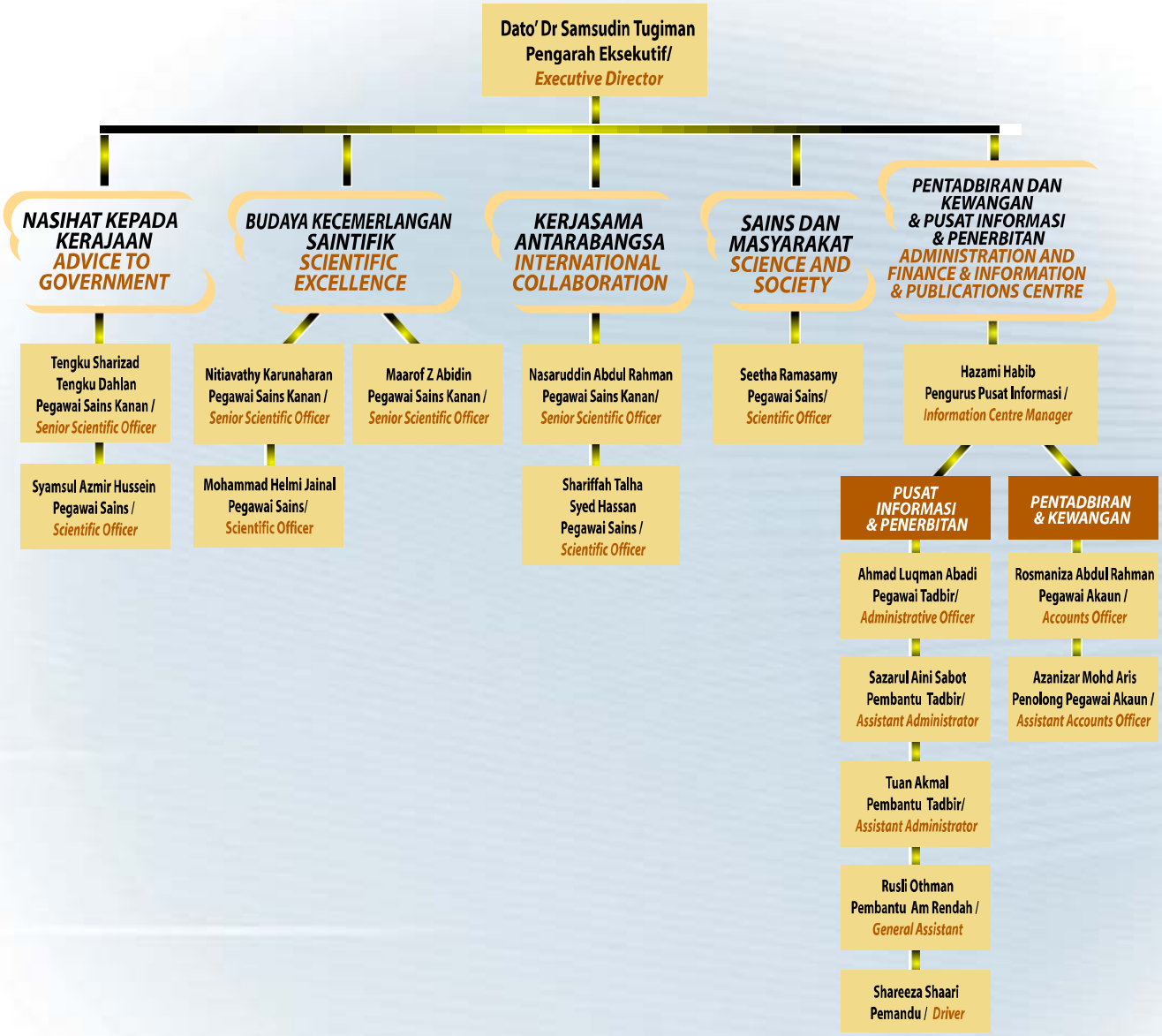
IAP Water Programme
Tan Sri Shahrizaila Abdullah FASc

INTEL – ISEF Science Programme
Prof Dr Ho Chee Cheong FASc

Carta Organisasi ASM *ASM Organisational Chart*



Sekretariat *Secretariat*



Dalam Kenangan *In Memoriam*



Datuk Dr. Syed Mohamed Syed Alwi Alhady

Al-Fatihah kepada Allahyarham Datuk Dr Syed Mohamad Syed Alwi Alhady

Dr Syed Mohamad Syed Alwi Alhady akan selalu dikenang sebagai salah seorang Pengasas Felo yang banyak memberi sumbangan dalam penubuhan awal Akademi Sains Malaysia. Dr Syed Mohamad telah mengungguli kerjaya beliau dengan memainkan peranan sebagai pakar bedah yang berjaya. Allahyarham juga memberikan sumbangan yang tidak berbelah bagi dan bekerja keras untuk Akademi serta kerjaya beliau. Allahyarham menyandang pelbagai jawatan baik di dalam negara mahupun negara serantau. Allahyarham merupakan bekas Presiden, Persatuan Perubatan Malaysia, bekas Pengerusi Majlis Universiti Malaya, bekas Pengerusi *Kuala Lumpur Commodity Exchange* , bekas Pengerusi *South East Asia Development Corporation Bhd* dan Pemegang Amanah Kolej Pakar Bedah Malaysia.

Allahyarham akan sentiasa dikenang. Kami mengucapkan takziah kepada keluarga Allahyarham. Sesungguhnya, kami juga turut merasakan kehilangan Allahyarham. Semoga Allahyarhan dicucuri rahmat. Al-Fatihah.

Tribute to Allahyarham Datuk Dr Syed Mohamad Syed Alwi Alhady

Dr Syed Mohamad will always be remembered as one of the Foundation Fellows who had contributed much to the early development of the Academy of Sciences Malaysia. Dr Syed Mohamad had distinguished himself by being a prominent and successful surgeon and also as a selfless individual who had worked hard to elevate the status of the Academy and the profession. He has served in various capacities both nationally and regionally; he was the past President, Malayan Medical Association, former Chairman of Council, University of Malaya, former Chairman of Kuala Lumpur Commodity Exchange, former Chairman of South East Asia Development Corporation Bhd and Trustee, College of Surgeons, Malaysia.

He will be greatly missed. We extend our deepest condolences to his family and we share with them their loss. May God bless him. Al-Fatihah.

Aktiviti
Activities





Acara Utama 2005

2005 Highlights

PENGANUGERAHAN SIJIL FELO KEHORMAT AKADEMI SAINS MALAYSIA KEPADA YAB PERDANA MENTERI

Akademi Sains Malaysia telah menganugerahkan Sijil Felo Kehormat kepada YAB Perdana Menteri Malaysia, Dato' Seri Abdullah Ahmad Badawi kerana kepimpinan dan komitmen beliau yang unggul terhadap perkembangan sains, teknologi dan inovasi Malaysia ke arah penghasilan ilmu pengetahuan baru, penghasilan kekayaan dan manfaat kepada masyarakat. Majlis penganugerahan telah disempurnakan oleh Seri Paduka Baginda Yang Dipertuan Agong semasa majlis makan malam ulangtahun ke-10 Akademi Sains Malaysia.

THE CONFERMENT OF HONORARY FELLOW OF THE ACADEMY OF SCIENCES MALAYSIA ON RT. HON PRIME MINISTER

Rt. Hon Prime Minister of Malaysia, Dato' Seri Abdullah Ahmad Badawi was conferred the Honorary Fellowship of the Academy of Sciences Malaysia for his distinguished leadership and commitment to the development of Malaysia's science, technology and innovation towards the generation of new knowledge, wealth creation and benefits to society. The Honorary Fellowship was confered by Seri Paduka Baginda Yang di-Pertuan Agong during the 10th Anniversary dinner of the Academy.



Seri Paduka Baginda Yang DiPertuan Agong dan Seri Paduka Baginda Raja Permaisuri Agong bersama YAB Dato' Seri Abdullah Ahmad Badawi and Dato' Sri Dr Jamaludin Jarjis.
Seri Paduka Baginda Yang DiPertuan Agong and Seri Paduka Baginda Raja Permaisuri Agong with YAB Dato' Seri Abdullah Ahmad Badawi and Dato' Sri Dr Jamaludin Jarjis.



YAB Perdana Menteri Malaysia Dato' Seri Abdullah Ahmad Badawi menyampaikan ucapan.
Rt. Hon. Prime Minister of Malaysia, Dato' Seri Abdullah Ahmad Badawi delivering his acceptance speech.



Penganugerahan Sijil Felo Kehormat kepada Dato' Seri Abdullah Ahmad Badawi oleh Seri Paduka Baginda Yang Dipertuan Agong.
The conferment of Honorary Fellows upon Rt. Hon. Dato' Seri Abdullah Ahmad Badawi by Seri Paduka Baginda Yang Dipertuan Agong.

YAB Perdana Menteri dalam ucapan penerimaan beliau menekankan kepentingan inovasi dan pengkomersialan. Beliau juga berharap Akademi akan menjadi satu organisasi di mana Kerajaan boleh mendapat nasihat mengenai isu-isu sains dan teknologi yang lazimnya mempengaruhi penggubalan dasar. Beliau juga berpendapat bahawa Akademi harus menggunakan kapasitinya untuk mengumpulkan pakar dalam semua bidang sains dan teknologi dan berusaha ke arah satu tujuan yang sama untuk perkembangan sains dan teknologi serta kebajikan masyarakat.

YAB Dato' Seri Abdullah Ahmad Badawi, melalui pelbagai inisiatif dan dasar yang telah dilaksanakan di bawah kepimpinan beliau, telah membuktikan bahawa Kerajaan mempunyai komitmen yang jelas dan tegas dalam memastikan perlaksanaan ekonomi berasaskan pengetahuan dan prestasi melalui kecemerlangan sains dan teknologi. YAB Dato' Seri Abdullah Ahmad Badawi merupakan pemimpin yang berkomitmen dan mampu mengemudikan kepimpinan beliau dengan mewujudkan budaya prestasi kerja yang tinggi, integriti, bertanggungjawab dan pengurusan yang bijak di mana semua ini diperlukan untuk merealisasikan hasrat Wawasan 2020.

The Rt. Hon. Prime Minister in his acceptance speech highlighted the importance of innovation and commercialisation. He also hoped the Academy would emerge as an organisation which the Government can turn to for advice on the scientific and technological issues that frequently pervade policy decisions. He strongly felt that the Academy should leverage on its capacity to be able to bring together committees of experts in all areas of scientific and technological endeavors for one common cause, for the furtherance of science and technology and their use for the well-being of society.

The Rt. Hon. Dato' Seri Abdullah Ahmad Badawi, through the various initiatives and policies implemented under his administration, has demonstrated that the Government has a clear and firm commitment to see a knowledge-driven, performance-based economy emerge through excellence in S & T. Rt Hon. Dato' Seri Abdullah Ahmad Badawi is a committed leader who drives results by instilling a high performance culture, integrity, accountability and sound management that is needed more than ever towards the realisation of Vision 2020.

DANA KECEMERLANGAN SAINTIFIK (SAGA)

Akademi Sains Malaysia menekankan kepentingan penyelidikan asas untuk membina landasan bagi pengetahuan baru untuk menjadi pengeluar teknologi disamping membina asas sains yang kukuh dalam Negara ini. Mencapai kecemerlangan dalam bidang sains asas merupakan kunci utama untuk menghasilkan saintis yang berkualiti, setaraf dengan saintis-saintis antarabangsa agar Malaysia dikenali di peringkat antarabangsa dalam bidang sains, teknologi dan inovasi.

Maka amat sesuai sekali apabila pada 2005 MOSTI telah menyalurkan Dana

SCIENTIFIC ADVANCEMENT FUND ALLOCATION (SAGA)

The Academy of Sciences Malaysia champions the importance of fundamental research as this fosters discovery of new knowledge towards becoming producers of technology as well as builds a strong scientific base in the country. Achieving excellence in fundamental sciences is a key factor towards producing high quality scientists who rank consistently among the top scientists in the world, and Malaysia gaining international recognition in science, technology and innovation.

It was therefore higly appropriate that in 2005 MOSTI channelled the Scientific Advancement





Professor John Sheppard Mckenzie.
Professor John Sheppard Mckenzie.

Professor John Sheppard Mckenzie menerima anugerah 'ASM Scientific Excellence Award in Honour of Tun Dr Mahathir Mohamad' yang disampaikan oleh Seri Paduka Baginda Yang Dipertuan Agong.
Professor John Sheppard Mckenzie receiving 'ASM Scientific Excellence Award in Honour of Tun Dr Mahathir Mohamad' by Seri Paduka Baginda Yang Dipertuan Agong.

Kecemerlangan Saintifik atau SAGA untuk penyelidikan sains asas dalam bidang Fizik, Kimia dan Fisiologi/Perubatan sebagai sebahagian daripada Program Nobel Laureate Kebangsaan. Akademi dengan peruntukan RM20 juta untuk dua tahun. SAGA diwujudkan dengan objektif jangka pendeknya untuk menggalakkan dan mengutamakan kepentingan penyelidikan asas, menggalakkan pembangunan penyelidikan sains asas, membina kapasiti manusia dalam bidang sains asas dan meningkatkan kerjasama di antara kumpulan-kumpulan penyelidik dalam bidang-bidang utama di dalam negara.

Fund Allocation SAGA fund for fundamental sciences research in the fields of Physics, Chemistry, and Physiology / Medicine as part of the Academy's National Nobel Laureate Programme with a funding of RM20 million for two years. SAGA was established with these short-term objectives: promote and emphasise the importance of fundamental research; encourage advancement of fundamental science research; develop human capital in fundamental sciences and enhance collaboration between research groups in priority areas in the country.

Enam puluh satu projek sedang dibiaya oleh Dana SAGA dengan pembiayaan keseluruhan RM15,757,570. Butir terperinci mengenai penerima dan tajuk projek terdapat di bahagian 'Program Kecemerlangan Saintifik' dalam laporan ini.

Sixty one projects are currently being funded under SAGA with a total funding RM15,757,570. Details on recipients and projects title can be found in the section on 'Scientific Excellence Programme' in the report.

ANUGERAH KECEMERLANGAN SAINTIFIK ASM PENGHORMATAN KEPADA TUN DR. MAHATHIR MOHAMAD

ASM SCIENTIFIC EXCELLENCE AWARD IN HONOUR OF TUN DR MAHATHIR MOHAMAD

Akademi Sains Malaysia merupakan satu badan yang ditubuhkan dengan misi untuk menerajui, memupuk dan meningkatkan kecemerlangan

The Academy of Sciences Malaysia is a body mandated with a mission that encompasses the pursuit, encouragement and enhancement of

dalam bidang sains, kejuruteraan dan teknologi untuk pembangunan negara dan manfaat kepada manusia. Akademi telah mewujudkan *"ASM Scientific Excellence Award in Honour of Tun Dr Mahathir Mohamad"* sebagai penghargaan kepada saintis/institusi yang telah menghasilkan penemuan penting dalam bidang penyelidikan tropika. Anugerah ini merupakan Anugerah Sains terunggul di Malaysia dalam bidang penyelidikan tropika yang dilancarkan sebagai satu penghormatan kepada Tun Dr. Mahathir Mohamad yang telah melaksanakan falsafah *'prosper–thy–neighbour'* dan penyelesaian *'win-win'* ke arah pembangunan negara Dunia Ketiga. Pemenang pertama anugerah ini ialah Profesor John Sheppard Mckenzie, *Curtin University of Technology,* Australia. Butiran lanjut mengenai anugerah ini terdapat di bahagian 'Program Kecemerlangan Saintifik' dalam laporan ini.

excellence in the fields of science, engineering and technology for the development of the nation and the benefit of mankind. The Academy has instituted the ASM Scientific Excellence Award in Honour of Tun Dr Mahathir Mohamad in recognition of scientists/institutions who have made major breakthroughs in tropical research. This Award is Malaysia's most prestigious Science Award for tropical research launched in honour of Tun Dr Mahathir Mohamad who practices the noble philosophy of 'prosperthy–neighbour' and 'win–win' solutions toward development of Third World countries. The first award was won by Professor John Sheppard Mackenzie, Curtin University of Technology, Australia. More details on this Award can be found in the section on 'Scientific Excellence Programme' in this report.

ASM SEBAGAI TUAN RUMAH PEJABAT SERANTAU ICSU YANG BARU

Wakil ICSU *National Members* untuk rantau Asia Pasifik telah membincangkan penubuhan Pejabat Serantau ICSU sebulat suara bersetuju untuk Malaysia dan Akademi Sains Malaysia menjadi hos Pejabat Serantau ICSU untuk Asia dan Pasifik. Cadangan ini kemudiannya telah diluluskan oleh Kerajaan Malaysia pada Disember 2005. Pejabat ini ditempatkan di Bangunan Akademi Sains yang baru diubah-suai.

ASM HOSTS NEW ICSU REGIONAL OFFICE

ICSU representative of National Members for Asia Pacific region discused on the establishment of ICSU Regional Office. The meeting unanimously agreed that Malaysia and the Academy of Sciences Malaysia be the host of the ICSU Regional Office in Asia and the Pacific. It was later approved by the Government of Malaysia in December, 2005. The office will be located at the Academy of Sciences building that has been recently renovated.

PENGUBAHSUAIAN PEJABAT ASM

Kerja-kerja pengubahsuaian bangunan pejabat ASM di 902-4, Jalan Tun Ismail telah dimulakan pada pertengahan tahun 2005 dan telah siap pada bulan Mac 2006.

ASM OFFICE RENOVATION

Renovations to the ASM building at 902-4, Jalan Tun Ismail began on mid 2005 and was completed and ready for occupation on March 2006.



Bangunan baru yang diubahsuai ini menempatkan pejabat Akademi, pusat maklumat, bilik perbincangan, bilik-bilik mesyuarat dan Pejabat ICSU bagi Rantau Asia Pasifik.

The renovated Academy building houses the Academy office, an information centre, conference room, meeting room and ICSU Regional Office for Asia Pacific.

SAMBUTAN ULANGTAHUN KESEPULUH ASM

Akademi Sains Malaysia telah ditubuhkan di bawah Akta Akademi Sains 1994 di mana ia mula berkuasa pada 1 Februari 1995. Tahun 2005 merupakan tahun yang istimewa kerana ia merupakan ulangtahun kesepuluh ASM.

Sepanjang sepuluh tahun, Akademi telah melakarkan kejayaan dan pencapaian yang membanggakan, seperti *Malaysian Antarctica Research Programme (MARP)* dan *National Nobel Laureate Programme*. Khidmat nasihat yang diberikan oleh Akademi kepada kerajaan berkenaan sains, kejuruteraan dan teknologi (SET) telah disambut baik dan Akademi berbangga dalam memberikan pandangan kepada Kementerian berkenaan sains dan teknologi dan telah diterima dan diimplimentasikan. Untuk mengangkat budaya kecemerlangan saintifik, Anugerah Kecemerlangan Saintifik ASM Penghormatan Tun Dr. Mahathir Mohamad telah dilancarkan tahun ini.Selain itu, Program Kesedaran Sains ASM merupakan salah satu daripada teras Akademi. Pelbagai aktiviti telah dijalankan untuk mempromosikan kesedaran sains kepada masyarakat tentang peri pentingnya SET dalam kehidupan seharian dan menjadikan sains satu budaya.

ASM CELEBRATES 10TH ANNIVERSARY

The Academy of Sciences Malaysia was established under the Academy of Sciences Act 1994 which came into force on 1 February 1995. The year 2005 was a special year because it marked the 10th Anniversary of ASM.

Over the 10 years, the Academy has had some major successes and achievements. In particular, the Malaysian Antarctica Research Programme and the National Nobel Laureate Programme are a source of great pride and joy. The independent advice given by the Academy to the government on matters pertaining to science, engineering and technology (SET) has been received favourably and the Academy takes pride in recording that its suggestion for a separate Ministry for science, technology has been accepted and implemented. To foster a culture of Scientific excellence, this year saw the launch of the ASM Scientific Excellence Award in Honour of Tun Dr Mahathir Mohamad. The ASM Science Awareness Programme is another one of our thrust areas where the Academy has left an indelible mark. A range of activities has been undertaken to promote public awareness of the importance of SET in everyday life and to make SET a pervasive culture.



Projek di bawah Rancangan Malaysia Kelapan (RMK8)

Projects under Eighth Malaysia Plan (8MP)

Rancangan Malaysia Kelapan merangkumi tempoh masa dari tahun 2001 hingga 2005. Ia merupakan fasa pertama perlaksanaan *Third Outline Perspective Plan* yang menghasilkan *National Vision Policy* (NVP) yang berpandukan cabaran strategik Wawasan 2020, di mana ia menggariskan halatuju Malaysia untuk menjadi Negara maju menjelang 2020. Akademi memberi sumbangan dalam merealisasikan hasrat ini melalui Program *Nobel Laureate* Kebangsaan dan Program Penyelidikan Antartika Malaysia di bawah Rancangan Malaysia Kelapan.

The Eighth Malaysia Plan, covering the period of 2001-2005, was the first phase in the implementation of the Third Outline Perspective Plan which embodies the National Vision Policy (NVP). The NVP is guided by the strategic challenges of Vision 2020, which laid out the directions for Malaysia to become a fully developed nation by 2020. The Academy of Sciences Malaysia contributed towards realising this vision as the implementing agency for the National Nobel Laureate Programme and the National Antarctica Research Programme.

PROGRAM *NOBEL LAUREATE* KEBANGSAAN

Objektif Program *Nobel Laureate* Kebangsaan adalah untuk meningkatkan tahap kecemerlangan penyelidikan sains ke tahap antarabangsa termasuk menghasilkan Pemenang Anugerah Nobel Malaysia menjelang tahun 2020, dan mewujudkan budaya penyelidikan saintifik dengan mengadakan program kepimpinan yang diketuai oleh saintis terkemuka. Bagi merapatkan jurang dalam mencapai kecemerlangan dalam bidang sains dan meningkatkan kesedaran mengenai Hadiah Nobel, banyak aktiviti telah diadakan di Malaysia oleh Pemenang Anugerah Nobel dan saintis terkemuka. Syarahan Perdana Sains, Syarahan Umum, Sesi Motivasi Sains dan Dialog bersama penyelidik adalah di antara aktiviti yang dilaksanakan.

Secara keseluruhannya, Malaysia berusaha gigih untuk memberi dorongan terhadap kreativiti individu dalam bidang sains untuk berjaya serta menyokong keperluan persekitaran yang akan menjadi pendorong untuk mencapai cita-cita, di mana ia merupakan ciri unik negara moden. Malaysia juga harus menggalakkan para saintis negara untuk mencapai kecemerlangan dan pengiktirafan antarabangsa, yang mana Anugerah Nobel adalah merupakan anugerah yang terunggul. Komuniti saintifik di Malaysia mendapat banyak manfaat daripada pengalaman dan kearifan Prof Brenner yang dikongsi bersama semasa syarahan tesebut.

Mesyuarat Tahunan antara Pemenang Anugerah Nobel Laureates bersama Saintis Muda di Lindau, Jerman

Satu lagi aktiviti yang berjaya di bawah Program Kebangsaan *Nobel Laureate* adalah Program Lindau. Program Lindau merupakan satu program yang membolehkan penyertaan

NATIONAL NOBEL LAUREATE PROGRAMME

The objective of the National Nobel Laureate Programme is to raise the standard of scientific research excellence to international standards including producing a Malaysian Nobel Laureate by the year 2020, and to create a scientific research culture by having leadership programmes headed by eminent scientists. To bridge the gap towards achieving excellence in science and enhancing awareness of the Nobel Prize, significant activities were conducted by Nobel Laureates and other eminent scientists in Malaysia. Scientific Lectures, Public Lectures, Science Motivation Sessions and Dialogues with researchers were among the activities held.

On a nationwide scale, Malaysia is seriously striving to provide the impetus for individual creativity in the fields of science to shine as well as support the existence of the needed environment for achieving an ambition unique among modern nations. Malaysia also needs to push its scientists to vie for international scientific excellence and recognition, of which the Nobel Prize is the Prize of Prizes. Members of the Malaysian scientific community had benefited much from Prof. Brenner's experience and wisdom shared through these lectures.

Annual Meeting of Nobel Prize Winners with Young Scientists at Lindau, Germany

Another successful activity under the National Nobel Laureate Programme is the Lindau Programme. The Lindau Programme is a programme that enables the participation of

saintis muda Malaysia di Mesyuarat Tahunan Pemenang Anugerah Nobel bersama Saintis Muda di Lindau, Jerman. Delegasi Malaysia yang mengambil bahagian dalam mesyuarat Lindau 2005 merupakan kumpulan kedua saintis muda Malaysia yang dihantar. Penglibatan Malaysia ini bermula dengan inisiatif Akademi pada tahun 2004. Mesyuarat Lindau 2005 merupakan mesyuarat tiga disiplin sains asas yang diadakan dari 26 Jun hingga 1 Julai 2005. Delegasi Malaysia terdiri daripada enam saintis muda dan diketuai oleh Profesor Ho Chee Cheong FASc. Tiga daripada enam saintis muda merupakan pemegang PhD.

young Malaysian scientists in the Annual Meeting of Nobel Prize Winners with Young Scientists at Lindau, Germany. The Malaysian delegation that participated in the 2005 Lindau Meeting was the second batch of young Malaysian scientists sent for this meeting. Malaysia's participation was initiated by the Academy in 2004. The 2005 Lindau Meeting was a tri-discipline natural sciences meeting held from 26th June – 1st July 2005. This year the Malaysian delegation comprised 6 young scientists led by Prof Ho Chee Cheong FASc. Of the 6 young scientists, 3 were PhD holders.

Tahun ini juga, Akademi dan Jawatankuasa Lindau menandatangani Memorandum Persefahaman untuk mengekalkan penglibatan Malaysia dalam Mesyuarat Tahunan Pemenang Anugerah Nobel bersama Saintis Muda. Datuk Dr. Salleh Mohd. Nor FASc, Naib Presiden Akademi dan Prof. Datuk Dr. Mazlan Othman FASc, Setiausaha Agung Akademi, telah

This year the Academy and the Lindau Committee signed a Memorandum of Understanding towards sustaining Malaysia's participation in the Annual Lindau Meeting of Nobel Prize Winners with Young Scientists. Datuk Dr Salleh Mohd Nor FASc, Vice President of the Academy and Prof Datuk Dr Mazlan Othman FASc, Secretary General, signed the MoU on behalf of ASM while



Delegasi Malaysia ke Mesyuarat Tahunan antara Pemenang Anugerah Nobel Laureate bersama saintis muda bersama Nobel Laureate Prof. Dr. Richard Ernst.
Malaysian Delegation to the Annual Meeting of Nobel Prize Winner with Young Scientists with Nobel Laureate Prof. Dr Richard Ernst.

menandatangani Memorandum Persefahaman bagi mewakili Akademi manakala Countess Sonja Bernadotte selaku Presiden Jawatankuasa Lindau dan Prof. Wolfgang Schuerer sebagai Pengerusi Jawatankuasa Lindau mewakili Jawatankuasa Lindau.

Countess Sonja Bernadotte as President of the Lindau Committee and Prof. Wolfgang Schuerer as Chairman of the Lindau Committee represented the Lindau Committee.

Dengan adanya Memorandum Persefahaman ini, saintis muda Malaysia dapat menyertai mesyuarat tahunan tersebut dan delegasi Malaysia akan dianggotai oleh tiga penyelidik muda dalam bidang sains asas – fizik, kimia dan perubatan/fisiologi – dan seorang wakil dari Akademi. Apabila mesyuarat antara disiplin diadakan, delegasi Malaysia akan dianggotai oleh lima pelajar PhD dan penyelidik muda dan seorang wakil dari Akademi Sains Malaysia. Memorandum Persefaman ini juga menyatakan bahawa Akademi Sains Malaysia akan menyelaraskan proses penilaian dan semua pemilihan akademik untuk delegasi Malaysia sejajar dengan kriteria pemilihan dan taraf akademik yang digubal oleh Panel Kajian Semula Jawatankuasa Lindau yang akan memberi keputusan akhir tentang calon yang dipilih.

With the MoU in force, young Malaysian scientists may participate in the annual meeting and the Malaysian Delegation will comprise up to 3 young researchers in the area of natural sciences – physics, chemistry and medicine/physiology – and one Academy representative. Moreover, when an interdisciplinary meeting is being held, the Malaysian delegation will comprise up to 5 Ph.D. students and young researchers and one representative of the Academy of Sciences Malaysia. The MoU also states that the Academy of Sciences Malaysia shall co-ordinate the evaluation process and all academic screening for the Malaysian delegation in accordance with the selection criteria and academic standards established by the Lindau Committee's Review Panel that will grant final acceptance of the selected candidates.

Kerjasama dua hala dengan Karolinska Institut 2005

Satu lagi aktiviti yang sedang dijalankan di bawah Program *Nobel Laureate* adalah Kerjasama Dua Hala dengan Karolinska Institut (KI), Sweden, iaitu Pusat Kecemerlangan dan Pusat Penganugerahan Nobel bagi Perubatan atau Fisiologi, bagi berkerjasama dalam penyelidikan dan pembangunan perubatan, latihan profesional dan program belajar ke peringkat PhD. Selaras dengan program ini, Dr. Kristina Teär Fahnehjelm, oftalmologi pediatrik di St. Erik's Eye Hospital, Karolinska Institut di Stockholm, telah melawat Malaysia dan memberi syarahan mengenai "*Posterior Ocular Malformations in Children: Teratological Aspects*" di Pusat Perubatan Universiti Malaya. Beliau

Bilateral Collaboration with Karolinska Institute 2005

Another on-going activity under the Nobel Laureate Programme is the Bilateral Collaboration with Karolinska Institute (KI), Sweden, a prestigious Centre of Excellence and Nobel Awarding Centre in Physiology or Medicine, to collaborate on medical research and development, professional training and study Programmes leading to PhD degrees. In conjunction with this programme, Dr Kristina Teär Fahnehjelm, a pediatric ophthalmologist at St Erik´s Eye Hospital, Karolinska Institute in Stockholm, visited Malaysia and delivered a lecture on 'Posterior Ocular Malformations in Children: Teratological Aspects' at the University Malaya Medical Centre. She expressed interest to

menyatakan keinginan untuk berjumpa dengan rakan sejawat dalam bidang yang sama di Malaysia, dengan hasrat untuk menjalin kerjasama di antara Karolinska dan beberapa institusi di Malaysia pada masa hadapan.

meet a Malaysian colleague in the same field, possibly with a view to future collaboration between Karolinska and Malaysian institutions.

Lanjutan dari itu, Prof. Sven Pettersson, Penyelaras KI, telah mengadakan perbincangan pada 30 Jun 2005 dengan Jawatankuasa Akademi Sains Malaysia yang dipengerusikan oleh Datuk Dr. M. Jegathesan FASc mengenai kerjasama dengan KI dalam bidang penyelidikan perubatan, inovasi dan komersial. Ini diikuti dengan perbincangan untuk melaksanakan kerjasama dua hala diantara institusi di Malaysia dan KI. Bidang yang dicadangkan untuk usahasama dan dibincangkan semasa sesi dialog yang akan diadakan adalah onkologi/epidemiologi, biologi penyakit, imunologi, kencing manis, artritis reumatoid dan penyelidikan sel stem. Dialog yang dicadangkan itu antara lain adalah untuk membantu pertukaran idea antara pakar Malaysia dan KI ke arah mengenalpasti bidang kerjasama dan untuk lebih memahami bidang penyelidikan masing-masing serta bagaimana untuk memanfaatkan program PhD atau latihan pasca kedoktoran serta merangka dokumen yang menggariskan terma bagi melaksanakan kerjasama teknikal termasuk pembiayaan.

Following this, Prof Sven Pettersson, KI Coordinator, had a discussion with members of the ASM committee chaired by Datuk Dr M. Jegathesan on 30 June 2005 on more collaborative efforts with KI in the area of medical research, innovations and commercialisation. This was followed by a discussion on moving forward with Bilateral Collaboration between Malaysian institutions and KI. The areas proposed for collaboration and to be addressed at the proposed joint dialogue are oncology/ epidemiology, infection biology, immunology, diabetes, rheumatoid arthritis and stem cell research. The proposed dialogue, among others, is hoped to facilitate exchange of ideas between Malaysian and KI experts towards identifying areas for possible collaboration and gaining a better understanding of each other's research work and to discuss how to take advantage of programmes such as PhD programme or post-doctoral training and formulate a document that would state the terms to spearhead such technical cooperation, including the funding.

Syarahan Umum Ulangtahun Kesepuluh ASM & Ceramah Motivasi Sains oleh Pemenang Anugerah Nobel Laureate Profesor Dr Sydney Brenner

ASM 10th Anniversary Oration & Science Motivation Talk by Nobel Laureate Professor Dr Sydney Brenner

Syarahan saintifik, syarahan umum, sesi motivasi sains dan forum khas oleh *Nobel Laureate* dianjurkan setiap tahun oleh Akademi Sains Malaysia sebagai sebahagian daripada Program *Nobel Laureate* Kebangsaan di bawah Kementerian Sains, Teknologi dan Inovasi. Tujuan Program *Nobel Laureate* Kebangsaan ini adalah untuk membina kecemerlangan dalam bidang

Scientific orations, public lectures, science motivation sessions and special forum by Nobel Laureates are organised annually in Malaysia by the Academy of Sciences Malaysia (ASM) as part of the National Nobel Laureate Programme under the Ministry of Science, Technology and Innovation. The aim of the National Nobel Laureate Programme is to build excellence in

sains, teknologi dan inovasi di Malaysia untuk dayasaing negara dan pengiktirafan antarabangsa.

science, technology and innovation in Malaysia for national competitiveness and international recognition.

Syarahan tahunan pada tahun ini oleh *Nobel Laureate* Profesor Dr. Sydney Brenner (Pemenang Anugerah Nobel dalam Fisiologi atau Perubatan 2002) pada 25 Ogos 2005. Syarahan ini juga merupakan Syarahan Perdana Ulangtahun Ke-10 Akademi Sains Malaysia dianjurkan oleh Akademi melalui kerjasama *British Council*. Profesor Dr. Sydney Brenner merupakan Nobel Laureate ke-15 mengendalikan program bersama Akademi semenjak tahun 2001.

The annual oration this year by Nobel Laureate Professor Dr. Sydney Brenner (Nobel Prize in Physiology or Medicine 2002) on 25 August 2005. The lectures was considered as the ASM 10th Anniversary Oration were organised by the Academy through collaboration with the British Council. Professor Dr. Sydney Brenner is the 15th Nobel Laureate to conduct programmes with the Academy in Malaysia since 2001.

Profesor Brenner telah membincangakan mengenai *'Humanity's Genes'* semasa syarahan yang diadakan di Institut Penyelidikan Perubatan dan mengenai *'How to Win A Nobel Prize'* semasa sesi motivasi sains di Universiti Kebangsaan Malaysia. Perkara yang dibangkitkan semasa syarahan ternyata mencabar minda pada masa yang sama amat praktikal. Syarahan Saintifik di IMR dihadiri oleh 350 peserta yang terdiri daripada penyelidik, pengamal perubatan, warga pendidik, pelajar dan orang awam. Sesi Motivasi Sains di UKM pula dihadiri lebih daripada 200 peserta yang terdiri daripada pelajar sarjana dan sarjana muda serta juga penyelidik dan warga akademik.

Professor Brenner spoke on 'Humanity's Genes' at the Oration that was held at the Institute for Medical Research (IMR) and on 'How to Win A Nobel Prize' at the Science Motivation Session that was held at Universiti Kebangsaan Malaysia (UKM). The points Prof Brenner raised during the lecture proved to be very thought provoking and practical. The Scientific Oration at IMR was attended by about 350 people comprising mainly of researchers, medical practitioners, academics, students and the general public. The Science Motivation Session at UKM was attended by over 200 people comprising mainly of postgraduates and undergraduates as well as researchers and academics.

PROGRAM PENYELIDIKAN ANTARTIKA MALAYSIA (MARP)

Pada tahun 2005, Program Penyelidikan Antartika Malaysia (MARP) telah mencapai beberapa kejayaan di dalam bidang pembangunan kapasiti manusia. Buat masa ini terdapat tujuh pelajar PhD yang menjalankan penyelidikan dalam pelbagai bidang seperti Biologi Antartika, atmosfera atas, interaksi suria dan bumi, cuaca dan iklim Antartika. Terdapat juga 21 pelajar MSc di bawah program MARP yang menjalankan penyelidikan dalam bidang biologi dan sains fizikal. MARP juga telah menerbitkan 47 kertas dalam jurnal dan prosiding terujuk. Secara keseluruhan terdapat 15 projek penyelidikan yang sedang dijalankan oleh MARP yang melibatkan 40 penyelidik dari tujuh universiti. Antara hasil utama projek termasuk kultur mikro alga, penghasilan teknologi esei enzim dan rekabentuk '*gene probe*' serta penemuan spesies bakteria baru di Antartika. Impak utama program adalah ia memberi sumbangan yang signifikan terhadap inisiatif nasional mengenai bioteknologi melalui *'bio prospecting'* di Antartika dalam bentuk ekstremofil.

Pada 10 Oktober 2005, Prof. Dr. Colin Summerhayes, Pengarah Eksekutif *Scientific Committee in Antarctic Research* (SCAR) telah melawat Pusat Penyelidikan Antartika Malaysia di Universiti Malaya. Lawatan adalah sejajar dengan penerimaan MARP sebagai ahli persatuan SCAR pada Oktober tahun 2004. Semasa lawatan, Prof. Summerhayes memberi taklimat kepada penyelidik Malaysia tentang perkembangan SCAR dan aktiviti yang sedang dijalankan, tawaran sokongan penyelidikan oleh SCAR serta pengurusan logistik di Antartika dan juga tanggungjawab MARP sebagai ahli SCAR.

Seminar mengenai Penyelidikan di Antartika dan Bengkel Pigmen telah dijalankan di

MALAYSIAN ANTARCTICA RESEARCH PROGRAMME (MARP)

For the year 2005, Malaysian Antarctica Research Programme (MARP) had achieved a number of milestones in the area of human resource capacity building. Currently, there are seven PhD candidates working on various fields dealing with Antarctic Biology, upper atmosphere, solar terrestrial interactions, weather and climate of Antarctica. There are also 21 MSc candidates under the MARP research programme working in the fields of biology and physical sciences. MARP members have also published 47 papers in refereed journals and proceedings. On the whole, there are currently 15 research projects being undertaken under MARP involving 40 researchers from 7 universities. Among the major outcomes of the projects include micro alga culture, development of technology of enzyme assay and gene probe design and also discovery of new species of bacteria in Antarctica. The major impact of MARP is that it contributes significantly to the national initiative on biotechnology through bio prospecting from Antarctica in the form of extremophiles.

On 10 October 2005, Prof Dr Colin Summerhayes, Executive Director of Scientific Committee in Antarctic Research (SCAR) visited the Malaysian Antarctic Research Centre at the University of Malaya. The visit was in conjunction with the acceptance of MARP as an associate member of SCAR in October 2004. During the visit, Prof Summerhayes briefed Malaysian researchers on the development of SCAR and its ongoing activities, SCAR's offer of research support and logistics arrangement in Antarctica and also on MARP's obligations in becoming members of SCAR.

A Seminar on Antarctic Research and a Pigment Workshop were successfully organised at the



Para penyelidik Malaysia di Stesen Penyelidikan Maitri di Antartika.
Malaysian Researchers at Maitri Research Station an Antarctica.

Universiti Malaya dari 27 Jun – 2 Julai 2005. Seminar dan Bengkel dianjurkan bersama oleh Akademi Sains Malaysia, Universiti Malaya dan MARP. Melalui aktiviti ini, MARP telah menjalin beberapa usahasama dengan *Britain Antarctic Survey* (BAS), *Korea Polar Research Institute* (KOPRI) dan *Australian Antarctic Division Laboratory* untuk melaksanakan program latihan bersama.

Penyelaras nasional bagi MARP, Prof. Azizan Abu Samah, mewakili program di Mesyuarat Pertama "*Open Consultative Forum for International Polar Year* (IPY) 2007-2008" di *Paris Intergovernmental Oceonographic Commission* (IOC) di Paris dari 10-11 Mac 2005. Lima projek penyelidikan MARP telah disenaraikan ke dalam '*expression of intent*' IPY 2007-2008. Forum ini memberi satu landasan perundingan bagi ramai pihak berkepentingan, memberi pandangan mengenai *Polar Year* dan sebagai landasan untuk bertukar maklumat dengan Jawatankuasa Bersama IPY. Objektif IPY adalah untuk

University of Malaya from 27 June – 2 July 2005. The Seminar and Workshop were jointly organised by the Academy of Sciences Malaysia, University of Malaya and MARP. Through these events, MARP had developed a few collaborative initiatives with Britain Antarctic Survey (BAS)of UK, Korea Polar Research Institute (KOPRI)and Australian Antarctic Division Laboratory for an attachment programme.

The National Coordinator of MARP, Prof Azizan Abu Samah, represented the programme at the First Meeting of the Open Consultative Forum for International Polar Year (IPY) 2007 – 2008 which was held at the Paris Intergovernmental Oceanographic Commission (IOC) in Paris from March 10-11, 2005. Five research projects from MARP were listed in the expression of intent of IPY 2007-2008. The forum provides a consultative platform for Polar Year development, facilitating dialogue among the numerous stakeholders, the expression of views on IPY 2007-2008 and a venue for exchange of information with the IPY Joint

mengeksploitasi sumber intelek dan aset sains negara-negara seluruh dunia untuk perkembangan pengetahuan dan pemahaman saintifik mengenai kutub. Pada tahun 2005, Malaysia juga diterima sebagai ahli '*Joint Committee on Antarctic Data Management (JCADM)*'. MARP juga bekerjasama dengan Pusat Sains Negara dan Universiti Malaya bagi menganjurkan program dan pameran untuk meningkatkan kesedaran pelajar mengenai kewujudan Antartika dan sains di benua tersebut.

Committee. The objective of IPY is to exploit the intellectual resources and science assets of nations worldwide to make major advances in polar knowledge and scientific understanding. In 2005, Malaysia was also accepted as a member of the Joint Committee on Antarctic Data Management (JCADM). MARP also collaborated with the National Science Centre and the University of Malaya in organising a programme and exhibition to enhance students' awareness of the existence of Antarctica and the science within the continent.



Dr Allison Ian, Bahagian Antartik Australia menyampai ucapan tentang IPY di UM.
Dr Allison Ian of Australian Antarctic Division delivering his presentation on IPY at UM.



Nasihat kepada Kerajaan

Advice to Government

Disebabkan Akademi Sains Malaysia sebagai sebuah institusi merangkumi pelbagai disiplin dan diterajui oleh felo-felo yang tersohor, Akademi diminta untuk memberi khidmat nasihat kepada Kerajaan berkaitan isu-isu strategik Negara. Dalam hal ini, Akademi tidak hanya diberikan projek jangkamasa pendek dan panjang, tetapi juga diminta untuk mengendalikan 'due-diligence' ke atas cadangan yang diberi kepada Kerajaan berkaitan pembangunan strategik sains dan teknologi.

Due to its multi-disciplinary nature and the high standing of its Fellows, the Academy is frequently called upon to provide independent advice to the government on issues of national strategic interest. In this regard, not only is the Academy given specific short and long term projects, ASM is also called upon to conduct due diligence on proposals related to S & T development that are submitted to the Government.

DIALOG DENGAN YB MENTERI SAINS, TEKNOLOGI DAN INOVASI DENGAN FELO AKADEMI SAINS MALAYSIA

Memahami peranan penting yang dimainkan oleh Akademi dalam usaha mencapai objektif MOSTI, YB Menteri telah mengadakan satu dialog dengan Felo Akademi Sains Malaysia pada 14 Jun 2005 di Kuala Lumpur. Semasa dialog tersebut, YB Menteri di antara lain menekankan kepentingan sains, teknologi dan inovasi untuk pembangunan negara. Akademi sebagai satu organisasi ilmu harus memikirkan bagaimana memainkan peranan bagi memastikan relevansi sains dan teknologi kepada masyarakat dan ekonomi. Adalah penting untuk menambah penge-tahuan melalui penyelidikan namun konsep manfaat kepada masyarakat dan ekonomi mesti diutamakan. YB Menteri juga merasakan bahawa Akademi perlu mengkaji semula bidang fokusnya. Beliau seterusnya mencadangkan untuk mewujudkan satu inventori khas bagi Felo Akademi kerana ia adalah penting untuk menjana minda para Felo. YB Menteri juga menekankan isu tiada keserasian kemahiran

DIALOGUE BETWEEN THE MINISTER OF SCIENCE, TECHNOLOGY & INNOVATION AND FELLOWS OF THE ACADEMY OF SCIENCES MALAYSIA

Realising the important role, the Academy can play in achieving the objectives of the Ministry of Science, Technology and Innovation (MOSTI), the Minister conducted a dialogue with the Fellows of the Academy of Sciences Malaysia on 14 June 2005 in Kuala Lumpur. In the dialogue, among other things, YB Minister emphasised the importance of science, technology and innovation for the development of the nation. The Academy as a learned society should deliberate on the role it should play to ensure the relevance of Science and Technology to the people and economy. It is important to upgrade knowledge through research but the concept of societal and economic returns has also to be emphasised. YB Minister also felt that the Academy needs to review its thrust areas. He further suggested creating a special inventory for Fellows of the Academy as it is important to unlock and harness the brainpower of the Fellows. YB Minister further stressed on the mismatch of skills involved in



Felo Akademi Sains Malaysia di sesi dialog dengan Menteri Sains, Teknologi & Inovasi.
Fellows of the ASM at the dialoque session with the Minister of Science, Technology and Innovation.

dalam usaha membawa hasil penyelidikan ke peringkat komersial. Beliau juga turut menekankan perlunya produk dan hasil bernilai tambah untuk meningkatkan peluang pasaran khususnya dalam sektor pertanian.

MALAYSIAN SCIENCE AND TECHNOLOGY CONVENTION (MASTEC) 2005

MASTEC adalah merupakan satu acara tahunan penting Akademi yang mempunyai objektif utama untuk membincangkan isu-isu dan perkembangan sains dan teknologi terkini di Malaysia. MASTEC tahun ini yang bertema "*Nurturing Effective Research Collaboration to Realise Innovation and Commercialisation for the Benefit Of Society*" adalah dikhususkan kepada usaha menyambungkan penyelidikan dan pembangunan di universiti dan institusi penyelidikan kepada keperluan industri dan masyarakat. Konvensyen ini dianjurkan bersama dengan *Malaysian Technology Development Corporation*.

Pada tahun 2005, MASTEC telah diadakan bersempena dengan *International Science Congress* (ISC) 2005. Acara tersebut merupakan satu mesyuarat saintifik penting yang dianjurkan bersama oleh Akademi Sains Malaysia dan *Malaysian Scientific Association* (MSA) bersempena dengan Ulangtahun ke-10 Akademi dan Jubli Emas MSA. ISC 2005 berlangsung dari 3 – 6 Ogos di Pusat Dagangan Dunia Putra (PWTC), Kuala Lumpur.

MASTEC 2005 telah menghasilkan satu model yang akan memastikan kerjasama dan usahasama yang kukuh di antara *stakeholders* seperti para penyelidik, penggubal dasar, *regulators*, pembiaya kewangan dan pasaran. Strategi bagi meningkatkan usahasama dan kerjasama di kalangan pihak yang terlibat ini dikenalpasti. Perkongsian sebegini akan memajukan bidang pendidikan, melaksanakan penyelidikan yang mempunyai tujuan yang

making the last mile of research into commercialisation. He also highlighted the need to have value added products and outputs to enhance their marketability especially in the agriculture sector.

MALAYSIAN SCIENCE AND TECHNOLOGY CONVENTION (MASTEC) 2005

MASTEC is the Academy's annual flagship event with a major objective of deliberating on the latest issues on the development of science and technology in Malaysia. This year's MASTEC theme "Nurturing Effective Research Collaboration to Realise Innovation and Commercialisation for the Benefit of Society" was specially aimed at linking research and development in universities and research institutions to the needs of industry and society. It was organised in partnership with the Malaysian Technology Development Corporation.

In 2005, MASTEC was held in conjunction with the International Science Congress (ISC) 2005. The event was a major scientific meeting jointly organised by the Academy of Sciences Malaysia and the Malaysian Scientific Association (MSA) in conjunction with the Academy's 10th Anniversary and MSA's Golden Jubilee. ISC 2005 ran from 3rd – 6th August 2005 at Putra World Trade Centre (PWTC), Kuala Lumpur.

MASTEC 2005 has generated a model which would ensure close cooperation and collaboration between stakeholders namely researchers, policymakers, regulators, financiers and the market. Strategies to enhance cooperation and collaboration among all relevant parties were identified. Such partnerships will invigorate education, conduct research of mutual interest and translate the results of research to benefit society effectively

sama dan menjadikan hasil penyelidikan sesuatu yang bermanfaat kepada masyarakat secara berkesan sebagai satu jalan mengekalkan relevansi penyelidikan dan pembangunan saintifik kepada masyarakat. Penceramah dari Sweden dan Australia membentangkan kertas kerja mengenai "*Keys for Effective R&D Management to Encourage Collaboration among Researchers, Industry and the Government towards successful Innovation and Commercialization*. Mereka adalah Professor Jan Carlstedt Duke dari Karolinska Institut, Sweden dan Professor Robert Watts dari Akademi Sains Australia. MTDC juga membentangkan kertas kerja mengenai *"Review of Strategies to Promote Effective Collaboration in R&D in Malaysia to Form and Sustain Effective Linkages between Researchers, Academics and Industry and Recommendations to Realize Successful Innovation and Commercialization*".

as a means of sustaining the relevance of scientific research and development to society. International speakers from Sweden and Australia gave their talk on "Keys for Effective R&D Management to Encourage Collaboration among Researchers, Industry and the Government towards. Successful Innovation and Commercialisation." They were Professor Jan Carlstedt Duke from Karolinska Institute, Sweden and Professor Robert Watts from Australian Academy of Sciences. MTDC also presented a paper on "Review of Strategies to Promote Effective Collaboration in R&D in Malaysia to Form and Sustain Effective Linkages between Researchers, Academics and Industry and Recommendations to Realise Successful Innovation and Commercialisation."

Hasil dari MASTEC 2005 adalah satu laporan nasihat kepada kerajaan bertajuk "*Recommendations to Promote Effective Collaboration in R & D In Malaysia to Form and Sustain Effective Linkages Between Researchers, Academics and Industry to Realize Successful Innovation and Commercialization*".

The final output of MASTEC 2005 was an advisory report to the government entitled "Recommendations to Promote Effective Collaboration in R & D In Malaysia to Form and Sustain Effective Linkages Between Researchers, Academics and Industry to Realise Successful Innovation and Commercialisation."

NASIHAT MITIGASI BENCANA TSUNAMI DAN GEMPABUMI

Berikutan tragedi tsunami yang telah melanda Negara pada 24 Disember 2004, YB Menteri Sains, Teknologi dan Inovasi telah mengarahkan Akademi mengkaji impak tsunami tersebut dan menjalankan penyelidikan untuk memahami keadaan dan impak tektonik dan seismik di Malaysia. Kajian tersebut adalah bertujuan untuk memberi input kepada dasar dan strategi negara. Antara aktiviti yang terhasil dari inisiatif ini adalah bengkel dan program-program penyelidikan.

ADVICE ON TSUNAMI AND EARTHQUAKE HAZARD MITIGATION

Resulting from the tsunami disaster on 24 December 2004, YB Minister of Sciences, Technology and Innovation requested the Academy to study the impact and conduct research to understand the situation and impact of tectonic and seismic hazard in Malaysia. This research was carried out to provide input to national strategy and policy. Among the activities emanating from this study are the national workshop and research programmes.

Bengkel Kebangsaan *"Tsunami and Earthquake Hazard Mitigation: Considerations for Malaysian Planning Design & Construction Practice"*

Akademi Sains Malaysia dan Pusat Penyelidikan Perumahan, Fakulti Kejuruteraan, Universiti Putra Malaysia menganjurkan Bengkel Kebangsaan bertajuk *"Tsunami and Earthquake Hazard Mitigation: Considerations for Malaysian Planning Design & Construction Practice"* pada 22-23 Ogos 2005 di Pulau Pinang. Seramai 50 peserta menghadiri bengkel tersebut. Objektif bengkel ini adalah untuk membentangkan bencana gempabumi dan tsunami di Malaysia dan negara-negara ASEAN. Ia juga membincangkan langkah-langkah mitigasi termasuk perancangan, rekabentuk dan pembinaan struktur kejuruteraan, pembelajaran daripada pengalaman dan amalan negara lain. Di antara penceramah yang hadir di bengkel tersebut terdiri daripada Profesor Narendra Taly dari *California State Univesity*, Prof. Dr. Mashur Irsyam dari *Institute of Technology* Bandung, Indonesia dan Prof. D.K. Paul dari India. Bengkel ini turut membincangkan dasar dan undang-undang mitigasi bencana gempabumi Malaysia. Peserta juga mendapat peluang melawat kawasan bencana tsunami di Kuala Muda, Kedah.

Kajian Bencana dan Risiko Tsunami dan Gempabumi di Malaysia

Kementerian Sains, Teknologi dan Inovasi telah mengarahkan Akademi Sains Malaysia untuk menjalan kajian berkenaan kesan gempabumi di Malaysia. Lanjutan dari itu, Akademi Sains Malaysia telah dilantik sebagai Pengurus Projek bagi Kajian Bencana dan Risiko Gempabumi dan Tsunami di Malaysia pada 13 Disember 2005. Objektif projek adalah untuk menilai risiko gempabumi dan tsunami di Malaysia. Di antara agensi dan universiti yang terlibat dalam kajian

National Workshop on "Tsunami and Earthquake Hazard Mitigation: Considerations for Malaysian Planning Design & Construction Practice"

The Academy of Sciences Malaysia and Housing Research Centre, Faculty of Engineering, Universiti Putra Malaysia organised a National Workshop on "Tsunami and Earthquake Hazard Mitigation: Considerations for Malaysian Planning Design & Construction Practice" from 22 –23 August 2005 in Pulau Pinang. About 50 participants attended the workshop. The objective of the Workshop was to present the potential hazards resulting from earthquakes or earthquake-related natural disasters in Malaysia and countries in the ASEAN region. It also discussed possible mitigation measures including the planning, design and construction of engineering structures, learning from experiences and practices in other countries. Among the speakers at the workshop were Prof Narendra Taly from California State University, Prof Dr Mashur Irsyam from Institute of Technology Bandung, Indonesia, and Prof D.K Paul from India. The workshop discussed policies and regulations on earthquake hazard mitigation in Malaysia. The participants also had the opportunity to visit the tsunami-affected areas in Kuala Muda, Kedah.

Tsunami and Seismic Hazards and Risk Study in Malaysia

The Ministry of Science, Technology and Innovation had directed the Academy of Sciences Malaysia to undertake a study relating to the impact of earthquakes and tsunamis in Malaysia. Subsequently, the Academy was appointed as the Project Manager for the Seismic and Tsunami Hazards and Risk Study project on 13 December 2005. The objectives of the project were to assess the seismicity in Malaysia, Among the agencies and universities involved in the study are the

ini adalah Jabatan Meteorologi Malaysia, Jabatan Mineral dan Geosains, Universiti Teknologi Malaysia, Universiti Sains Malaysia dan Universiti Putra Malaysia. Projek tersebut sedang dalam proses perlaksanaan.

Malaysian Meteorological Department, Mineral and Geoscience Department, Universiti Teknologi Malaysia, Universiti Sains Malaysia, and Universiti Putra Malaysia. The project is currently ongoing.

Hasil kajian yang akan dikemukakan kepada Kerajaan merupakan laporan yang mengandungi penilaian bencana gempa bumi dan tsunami serta syor-syor strategi, amalan dan peraturan yang akan dilaksanakan oleh agensi berkaitan termasuk ringkasan untuk penggubal dasar, pelbagai peta seperti peta *'macrozonation'* dan peta '*microzonation*' bagi beberapa bandar utama serta spektrum respon rekabentuk.

The expected deliverables to the Government will be a Report containing an assessment of earthquake and tsunami hazards as well as recommendations on strategies, practices and regulations to be implemented by the relevant agencies including a summary for policy makers as well as a macrozonation map, microzonation maps of several major cities, and a design response spectrum.

KAJIAN *DUE DILIGENCE*

Pada tahun 2005, Akademi Sains Malaysia ditugaskan oleh Kementerian Sains, Teknologi dan Inovasi untuk melaksana *'due diligence'* ke atas kertas cadangan berkenaan *"Establishment of National Brain Research Centre"* dan *"Collaboration between International Foundation for Science (IFS), Malaysian Scientific Association (MSA) and Ministry of Science, Technology and Innovation."*

Akademi mencadangkan Professor Ishwar memberi sumbangan kepada pembangunan kapasiti penyelidikan di dalam bidang neuroendrokrinologi/neuropeptida serta neuroendokrinologi ikan Malaysia melalui kerjsama dengan Universiti Malaya dalam bidang penyelidikan neuropeptida dan dengan Universiti Putra Malaysia dalam bidang penyelidikan ikan.

Akademi Sains Malaysia juga mencadangkan kepada MOSTI untuk menyokong program kerjasama antara IFS, MSA dan MOSTI dengan membiayai kos yang berkaitan dengan *'mentorship'* di universiti-universiti dan institusi-institusi penyelidikan di Malaysia. Akademi

DUE DILIGENCE STUDY

In 2005, the Academy of Sciences Malaysia was requested by the Ministry of Science, Technology and Innovation to conduct due diligence on the proposals on "Establishment of a National Brain Research Centre" and "Collaboration between International Foundation for Science (IFS), Malaysian Scientific Association (MSA) and Ministry of Science, Technology and Innovation."

The Academy recommended that Professor Ishwar contribute to research capacity building in the area of neuroendocrinology/neuropeptide and fish endocrinology in Malaysia though collaboration with University of Malaya in the area of neuropeptide research and Universiti Putra Malaysia in fish research.

The Academy of Sciences Malaysia also recommended MOSTI to support the collaboration programme between IFS and MSA with MOSTI by covering the costs related to mentorship at Malaysian universities and research institutions. The Academy agreed to become the coordinator

Sains Malaysia bersetuju menjadi penyelaras program di mana ASM akan bertanggungjawab dalam memadankan *'mentee'* dan *'mentor'* yang sesuai serta menyediakan laporan dan maklumbalas kepada MOSTI apabila perlu.

RANKING BAGI PROGRAM PENYELIDIKAN DI MALAYSIA

Merujuk kepada cadangan untuk mewujudkan satu sistem pemantauan untuk mengikuti perkembangan prestasi saintis dan institusi di Malaysia, Akademi Sains Malaysia telah mengadakan lawatan ke pejabat Thomson ISI (*Institute of Scientific Information*) di Singapura pada 10 Mac 2005. Delegasi terdiri daripada Prof. Datuk Mazlan Othman FASc, Setiausaha Agung Akademi Sains Malaysia, Dr. Francis Ng FASc, Felo Akademi Sains Malaysia, Dato' Dr. Samsudin Tugiman, Pengarah Eksekutif Akademi Sains Malaysia dan Tengku Sharizad Tengku Dahlan, Pegawai Sains Kanan. Salah satu dari objektif lawatan adalah untuk meninjau maklumat yang ada di Thomson ISI mengenai Malaysia yang berguna dan juga untuk meninjau perkembangan terkini produknya yang relevan serta implikasi kewangan bagi perkhidmatannya. Dengan lawatan tersebut Akademi berjaya mendapat maklumat tentang produk dan perkhidmatan di ISI.

of the programme where it will be responsible for the matching between the mentees and suitable mentors and providing report and feedback to MOSTI as and when needed.

RANKING OF RESEARCH PROGRAMMES IN MALAYSIA

In view of the proposal to set up a monitoring system to track the performance of scientists and institutions in Malaysia, the Academy of Sciences Malaysia visited Thomson ISI (Institute of Scientific Information) office in Singapore on 10 March 2005. The delegation consisted of Prof Datuk Dr Mazlan Othman FASc, Secretary General Academy of Sciences Malaysia, Dr Francis Ng FASc, Fellow Academy of Sciences Malaysia, Dato' Dr Samsudin Tugiman, Executive Director Academy of Sciences Malaysia and Tengku Sharizad Tengku Dahlan, Senior Scientific Officer. One of the objectives of the visit was to see what information Thomson ISI had on Malaysia that was useful and to find out the future development of its products which are of relevance and the financial implications of the service. The visit provided the Academy with information on available products and services of ISI.



Program Kecemerlangan Saintifik

Scientific Excellence Programme

Malaysia, sebagai sebuah negara yang maju dan cepat membangun di dalam bidang sains, teknologi dan inovasi, perlu meningatkan kebolehan dan kemampuan di dalam bidang penyelidikkan dan pembangunan. Akademi memainkan peranan yang penting dalam membantu negara mencapai matlamat ini dengan menjuarai program-program kecemerlangan sains melalui pelbagai program kepada pelbagai kumpulan sasaran. Melalui program ini, Akademi telah menjemput ramai pemenang Hadiah Nobel dan Saintis terkenal dengan tujuan membina rangkaian kerjasama dengan pusat kecemerlangan sains dan teknologi di dunia.

It is imperative for Malaysia as a fast growing nation in science, technology and innovation, to increase its capacity and capability in research and development. The Academy plays a vital role in meeting this demand by championing the fostering of a culture of scientific excellence through programmes for various target groups. Through this platform, the Academy invites Nobel Laureates and Eminent Scientists with the aim of building networks and collaboration with many of the world's centres of excellence in science & technology. Under this trust, the Academy also manages the Scientific Advancement Fund Allocation (SAGA) for Fundamental Science research which is given to develop a strong fundamental science base of international standard in Malaysia.

DANA KECEMERLANGAN SAINTIFIK (SAGA)

SAGA mempunyai visi untuk menghasilkan kumpulan saintis dalam bidang sains asas yang bertaraf antarabangsa dan menubuhkan Pusat Kecemerlangan Penyelidikan Sains Asas dalam bidang utama yang dikenalpasti.

Fizik merangkumi bidang-bidang seperti *'Condensed Matter', 'Particle Physics'* dan *'Astrophysics'*, *'Atomic Physics* dan *Optics'*, *'Biophysics'* dan *'Medical Physics'* dan *'Theoretical Physics'*. Bidang kimia pula meliputi rekaan *'Molecular Design'* dan *'Synthesis'; 'Chemical Physics'; 'Material Chemistry'* dan *'Chemical Phenomena'*. Bidang fisiologi dan perubatan merangkumi mekanisma perkembangan penyakit; regulasi dan isyarat sel; konsep dan teknologi novel; novel terapi dan sains otak.

Setakat ini sebanyak 61 projek ditaja di bawah SAGA dengan jumlah keseluruhan pembiayaan adalah RM15,757,570. Carta 1 menunjukkan gambaran bilangan aplikasi dan projek yang diluluskan di dalam bidang fizik, kimia dan fisiologi atau perubatan. Carta 2 menunjukkan peratus bagi penyelidikan asas dan bukan asas SAGA bagi pusingan 1 dan 2. Terdapat

SCIENTIFIC ADVANCEMENT FUND ALLOCATION (SAGA)

SAGA has a vision to build a pool of scientists of international standing in fundamental sciences and to create Centres of Excellence in Fundamental Research in identified priority areas.

The major fields covered under Physics are Condensed Matter; Particle Physics and Astrophysics; Atomic Physics and Optics; Biophysics and Medical Physics and Theoretical Physics. The Chemistry discipline covered Molecular Design and Synthesis; Chemical Physics; Material Chemistry and Chemical Phenomena. Physiology or Medicine covered the areas of Mechanism of Disease Development; Cell Regulation and Signaling; Novel Technologies and Concepts; Novel Therapeutics and Brain Science.

Thus far 61 projects are being funded under SAGA with a total funding amount of RM15,757,570. Chart 1 provides an overview of the breakdown of number of applications and approved projects in the fields of Physics, Chemistry and Physiology or Medicine. Chart 2 shows the percentage of fundamental and non-fundamental research applications for SAGA in rounds 1 and 2. There

OVERALL STATUS OF FUNDING
SAGA ROUND 1 &2

Clusters	Applications Received		Projects Approved		Amount Approved (RM)	
	SAGA Round 1	SAGA Round 2	SAGA Round 1	SAGA Round 2	SAGA Round 1	SAGA Round 2
PHYSICS	49	7	8	3	1,430,820.34	538,939.31
CHEMISTRY	113	50	15	15	3,708,176.84	2,616,215.00
PHYSIOLOGY OR MEDICINE	106	36	5	15	1,950,000.00	5,377,419.12
TOTAL	268	93	28	33	7,088,997.18	8,534,573.43

Total Number of Projects approved: 61 Projects

Total Amount approved: RM 15,623,570.61

Carta 1:
Status Keseluruhan Dana SAGA Pusingan 1 & 2.

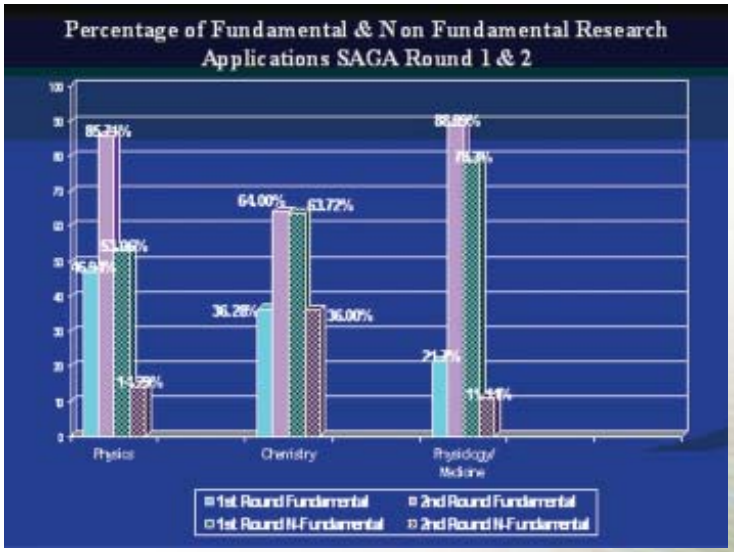
Chart 1:
Overall Status of Funding, SAGA Rounds 1 & 2.

pengurangan yang signifikan dalam bilangan aplikasi bukan sains asas bagi SAGA pusingan kedua berbanding dengan pusingan pertama, memandangkan komuniti saintifik telah mempunyai kefahaman tentang kriteria utama SAGA, iaitu peruntukan untuk penyelidikan sains asas sahaja. Sebanyak 361 daripada permohonan yang diterima untuk SAGA pusingan 1 dan 2, hanya 61 projek diluluskan sebagai kriteria utama untuk peruntukan SAGA, di mana pemohon mestilah merupakan penyelidik yang mempunyai rekod yang terbukti dalam bidang yang diminta dan mempunyai keupayaan untuk menerbitkan hasil penyelidikan dalam jurnal antarabangsa. Statistik menunjukkan bahawa kebanyakkan permohonan dan projek yang telah diluluskan adalah dalam bidang Kimia diikuti dengan Fisiologi atau Perubatan dan Fizik.

has been a significant reduction in the number of non-fundamental science applications in round 2 of SAGA as compared to round 1 as the scientific community has gained a better understanding of SAGA's main criteria i.e. funding for fundamental sciences research only. Out of a total of 361 applications received for SAGA rounds 1 and 2, only 61 projects were approved as another major criteria for SAGA funding is that applicants must be researchers with a proven track record in the field of funding requested and have the ability to publish in internationally refereed journals. Statistics show that the most number of applications and approved projects are in the Chemistry field followed by the Physiology/ Medicine and Physics.

Daripada 61 projek SAGA yang diberi peruntukan, dalam bidang Kimia, bidang penyelidikan yang paling banyak projek ialah 'Rekabentuk Molekul dan Sintesis'. Bagi Fisiologi atau Perubatan, bidang penyelidikan yang paling banyak projek adalah '*Mechanism of Disease Development*', '*Cell Regulation and Signaling*' dan '*Novel Therapeutics*'. Manakala dalam bidang Fizik, adalah '*Particle and Astrophysics*' diikuti dengan '*Condensed Matter*'.

Out of the 61 SAGA projects that are currently being funded, in the Chemistry field, the research area with the most number of projects is 'Molecular Design and Synthesis'. As for Physiology or Medicine, the research areas with the most number of projects are 'Mechanism of Disease Development', 'Cell Regulation and Signaling' as well as 'Novel Therapeutics'. In the field of Physics, the research areas with the most number of funded projects are 'Particle and Astrophysics' followed by 'Condensed Matter'.



Carta 2:
Peratus bagi Penyelidikan Asas dan Bukan Asas Aplikasi SAGA Pusingan 1 & 2.

Chart 2:
Percentage of Fundamental & Non Fundamental Research Applications, SAGA Rounds 1 & 2.

ANUGERAH KECEMERLANGAN SAINTIFIK ASM PENGHORMATAN KEPADA TUN DR. MAHATHIR MOHAMAD

Anugerah ini diberi kepada penyelidik yang telah menghasilkan penemuan penting yang diiktiraf di peringkat antarabangsa dalam bidang Perubatan Tropika, Pertanian Tropika, Senibina dan Kejuruteraan Tropika serta Sumber Alam Tropika. Hadiah bagi Anugerah ini merupakan wang tunai RM 100,000.00, beserta pingat dan sijil. Kriteria pencalonan untuk penganugerahan adalah penyelidik yang telah menghasilkan penemuan penting dalam penyelidikan tropika yang mendapat pengiktirafan antarabangsa serta membawa impak positif kepada masyarakat. Pencalonan boleh dibuat oleh individu atau institusi dan penerimaan anugerah juga boleh terdiri daripada individu atau institusi.

Pada tahun 2005, Akademi Sains Malaysia menerima sejumlah 17 pencalonan dari 10 negara termasuk Malaysia yang menamakan 6 calon. Input daripada dua ahli Panel Penasihat Antarabangsa iaitu Nobel Laureate Prof. Dr. Douglas Osheroff dan Nobel Laureate Prof. Lee Yuan Tseh juga turut diterima.

Semua Felo Akademi telah diundang untuk memilih pemenang melalui undian pada 6 Ogos 2005, dan Prof John Sheppard Mckenzie, Curtin University of Technology, Australia dalam bidang Perubatan Tropika dan merupakan penerima pertama anugerah nobel tersebut. Penyampaian hadiah telah disempurnakan pada 3 September 2005 oleh Seri Paduka Baginda Yang Di Pertuan Agong.

Professor Mackenzie merupakan Felo *Premier* dan Profesor bagi Penyakit Berjangkit Tropika di Bahagian Sains Kesihatan di *Curtin University of Technology*, Australia. Sumbangan Profesor Mackenzie yang terbesar adalah penyelesaian

ASM SCIENTIFIC EXCELLENCE AWARD IN HONOUR OF TUN DR MAHATHIR MOHAMAD

This Award is given to researchers who have made internationally recognised breakthroughs in tropical research in the fields of Tropical Medicine, Tropical Agriculture, Tropical Architecture and Engineering, and Tropical Natural Resources. The Award carries a cash prize of RM 100,000.00, a medal and a certificate. The nomination criteria for the awards are researchers who have made major breakthroughs in tropical research that have gained international recognition and brought greater positive impacts on the society. Nominations can be made by individuals or institutions and the recipient can be an individual or an institution.

In the year 2005, the Academy received a total of 17 nominations from 10 countries, including Malaysia which nominated 6 candidates. Input from two members of the International Advisory Panel namely Nobel Laureate Prof Dr Douglas Osheroff and Nobel Laureate Prof Lee Yuan Tseh as an International Advisory Panel were also received.

Fellows elected the winner by voting on 6 August 2005 and Prof John Sheppard Mckenzie, Curtin University of Technology, Australia in the field of Tropical Medicine became the first recipient of the award. Conferment of the award on the recepient by Yang Di Pertuan Agong was held on 3 September 2005.

Professor Mackenzie is the Premier Fellow and Professor of Tropical Infectious Diseases at the Division of Health Sciences at Curtin University of Technology, Australia. Professor Mackenzie's major contribution is in solving the problems

masalah berhubung dengan virus *Japanese Encephalitis*. Beliau terlibat dalam penyelidikan ke atas *phlogeny*, penyebaran virus ke Indonesia, Papua New-Guinea dan kepulauan Selat Torres, jenis nyamuk yang terlibat dalam jangkitan, analisa risiko dalam pembangunan kawasan baru dan menjelaskan ekologi virus di Papua New-Guinea dan Selat Torres. Akademi berharap penganugerahan ini akan membuka peluang untuk kerjasama dalam bidang penyelidikan dengan saintis terkemuka dalam bidang ini.

related to the Japanese Encephalitis virus. He has been involved in the investigation of the phylogeny, *virus movement into Indonesia, Papua-New Guinea and the Torres Straits Islands, the kind of mosquitoes involved in transmission, risk analysis about establishment in new areas, and elucidating the ecology of the virus in Papua-New Guinea and Torres Strait. The Academy envisages that the award will open the window of opportunities for research collaboration with renowned scientists in this area.*

PROGRAM TABUNG AMANAH PERUBATAN DR. RANJEET BHAGWAN SINGH 2005

Bagi tahun 2005, dua aktiviti utama telah dilaksanakan di bawah Program Tabung Amanah Perubatan Dr. Ranjeet Bhagwan Singh ialah Syarahan Memorial dan Bengkel Teknikal. Syarahan Memorial Dr. Ranjeet Bhagwan Singh Ke-7 telah diadakan pada 8 November 2005 di Institut Penyelidikan Perubatan, Kuala Lumpur. Prof. Sir Alec Jeffreys dari *University of Leicester*, United Kingdom menyampaikan syarahan bertajuk *"Genetic Finger Printing and Beyond"*.

DR. RANJEET BHAGWAN SINGH MEDICAL TRUST PROGRAMME 2005

For the year 2005, two main activities were conducted under the Dr Ranjeet Bhagwan Singh Medical Trust Fund Programme; namely Memorial Lecture and Technical Workshop. The 7th Dr Ranjeet Bhagwan Singh Memorial Lecture was organised on 8 November 2005 at the Institute for Medical Research, Kuala Lumpur. Prof Sir Alec Jeffreys from University of Leicester, United Kingdom delivered a lecture entitled "Genetic Finger Printing and Beyond". Approximately 300



Peserta yang menyertai Syarahan Memorial Dr. Ranjeet Bhagwan Singh.
Participants at the Dr. Ranjeet Bhagwan Singh Memorial Lecture.



Prof. Sir Alec Jeffreys semasa persidangan media di IMR.
Professor Sir Alec Jeffreys during the press conference at IMR.



Peserta teknikal bengkel diberi latihan oleh pakar perunding bengkel.
Technical workshop participants observe being given hands-on training by the workshop consultants expert team.



Perunding teknikal bengkel.
Technical workshop consultant.

Kira-kira 300 jemputan dari universiti, institut penyelidikan dan agensi Kerajaan menghadiri syarahan tersebut. Syarahan dipengerusikan oleh Prof. Dr. Koh Chong Lek FASc. Prof. Sir Alec Jeffreys juga melawat Jabatan Kimia, Petaling Jaya di mana beliau telah melawat makmal dan diberi taklimat mengenai aktiviti Jabatan.

guests representing universities, research institutes and government agencies attended the lecture. The lecture was chaired by Prof Dr Koh Chong Lek FASc. Prof Sir Alec Jeffreys also visited the Department of Chemistry, Petaling Jaya where he visited the laboratories and was given a briefing on the activities of the Department.

Pada tahun ini, bengkel Teknikal Dr. Ranjeet Bhagwan Singh telah dianjurkan bersama Universiti Malaya dari 14-17 Disember 2005. Bengkel bertajuk *"New Methods of Monitoring Immunity"* dikendalikan oleh sekumpulan pakar dari Australia termasuk Dr. Gunasegaran Karupiah, Ketua Kumpulan Penyakit Berjangkit, *John Curtin School of Medical Research, Australian National University* serta Dr. Phillip Hodgkin, Felo Utama Penyelidikan dan Presiden *Australian Society for Immunology* dan juga enam pakar teknikal. Sejumlah 35 penyelidik mengambil

This year the Dr Ranjeet Bhagwan Singh Technical Workshop was organised in collaboration with University of Malaya from 14 – 17 December 2005. The workshop entitled 'New Methods of Monitoring Immunity' was conducted by a group of experts from Australia which included Dr Gunasegaran Karupiah, Head of Infection and Immunology Group, the John Curtin School of Medical Research, Australian National University and Dr Philip Hodgkin, Principal Research Fellow and President of Australian Society for Immunology together with six other technical



Academician Dato' Dr. Salleh Mohd Noor FASc menyampaikan cenderamata kepada Prof. Sir Alec Jeffreys.
Academician Dato' Dr. Salleh Moh Noor FASc presenting a memento to Prof. Sir Alec Jeffreys.



Para peserta Bengkel Teknikal Bhagwan Singh.
Participants of Bhagwan Singh Technical Workshop.

bahagian dalam bengkel dan mereka diperkenalkan dengan teknik pengawasan imuniti. Bengkel ini juga membolehkan universiti terbabit membina rangkaian kerja untuk menjalankan penyelidikan bersama di kalangan universiti dan pakar-pakar. Penyelidik juga bersetuju untuk melatih rakan kerja mereka tentang teknik yang dipelajari di universiti masing-masing.

experts. A total of 35 researchers participated in this workshop and they were introduced to the technique of monitoring immunity. This workshop also enabled the participating universities to establish networks to undertake joint research among universities and experts. The researchers also agreed to train their colleagues on the techniques at their respective universities.

ANUGERAH PENYELIDIKAN KANSER MAKNA

Akademi Sains Malaysia telah menguruskan permohonan dan pemilihan Anugerah Penyelidikan Kanser MAKNA semenjak tahun 2002. Akademi mengambil peluang ini dengan menggunakan kepakaran felo untuk memberi manfaat kepada masyarakat.

Anugerah Penyelidikan Kanser MAKNA untuk tahun 2004 telah disampaikan pada 11 Januari 2005 di Universiti Putra Malaysia. Acara Penyampaian Anugerah telah disempurnakan oleh YB Dato' Kong Cho Ha, Timbalan Menteri Sains, Teknologi dan Inovasi. Dua penyelidik yang menerima anugerah adalah Cik Lim Moon Nian dari Institut Penyelidikan Perubatan dan Dr. Latifah Saiful Yazan dari Universiti Putra Malaysia. Penyelidikan mereka adalah mengenai *"Suppression of Multidrug Resistant Gene in Acute Myeloid Leukaemia Cells by Small Interfering RNA"* dan *"The in vivo Anti-tumour*

MAKNA CANCER RESEARCH AWARD

The Academy of Sciences Malaysia has been managing the applications and vetting of the MAKNA Cancer Research Award since 2002. The Academy takes this opportunity to utilise the expertise of its Fellows to benefit society through this programme.

The MAKNA Cancer Research Award for the year 2004 was awarded on 11 January 2005 at Dewan Taklimat, Universiti Putra Malaysia. The Award Ceremony was graced by YB Dato' Kong Cho Ha, Deputy Minister of Science, Technology and Innovation. The two researchers who won the award were Ms. Lim Moon Nian from Institute for Medical Research and Dr Latifah Saiful Yazan from Universiti Putra Malaysia. Their research studies were "Suppression of Multidrug Resistant Gene in Acute Myeloid Leukaemia Cells by Small Interfering RNA" and "In vivo Anti-tumour Promoting Activity of Bacteriocins from Lactic



Pemenang Anugerah Penyelidikan Kanser MAKNA 2005.
The successful recipients of the MAKNA Cancer Research Award 2005.

Promoting Activity of Bacteriocins from Lactic Acid Bacteria on Chemical Carcinogenesis in Mice Skin".

Untuk tahun 2005, Akademi telah menerima 27 permohonan dari pelbagai institusi penyelidikan. Tahun ini, jawatankuasa pemilihan yang dipengerusikan oleh Profesor Dr. Cheong Soon-Keng FASc telah memberikan Anugerah Penyelidikan Kanser MAKNA 2005 kepada tiga penyelidik seperti berikut:

(i) Masriana bt Hassan - RM 40,000
(ii) Mohd. Zulkefeli b. Mat Jusoh - RM 30,000
(iii) Yap Yoke Yeow - RM 30,000

PROGRAM SAINS ANGKASAWAN

Jawatankuasa Pemandu Program Angkasawan Negara yang dipengerusikan oleh Dato' Sri Najib Tun Razak yang bersidang pada 2004 telah melantik Akademi Sains Malaysia sebagai pengurus program sains yang akan diadakan sempena penempatan Angkasawan Malaysia pertama di *International Space Station* (ISS) pada Oktober 2007.

Agensi Angkasa Negara (ANGKASA) sebagai penerima program tersebut yang merupakan salah satu program *'offset'* pembelian kapal terbang SU-30MKN oleh Kementerian Pertahanan dari Rusia, telah bekerjasama rapat dengan Akademi, bukan sahaja dalam aspek sains, tetapi juga kesedaran awam. Beberapa pertukaran lawatan antara saintis Rusia dan Malaysia telah diadakan dalam konteks sains, kesedaran awam dan pengurusan program keseluruhan.

Walaupun pihak Rusia akan melancarkan Angkasawan Malaysia ke ISS, beberapa negara lain turut terlibat dalam program sains tersebut. Negara tersebut termasuklah Amerika Syarikat, Kanada, Itali dan Sepanyol. Program ini dijangka

Acid Bacteria on Chemical Carcinogenesis in Mice Skin" respectively.

For the year 2005, the Academy received 27 applications from various research institutions. This year the vetting committee chaired by Professor Dr Cheong Soon-Keng FASc has awarded the MAKNA Cancer Research Award 2005 to three researchers as follows:

(i) Masriana bt Hassan - RM 40,000
(ii) Mohd Zulkefeli b Mat Jusoh – RM 30, 000
(iii) Yap Yoke Yeow – RM 30, 000

THE ANGKASAWAN SCIENCE PROGRAMME

The National Angkasawan Programme Steering Committee chaired by Dato' Sri Najib Tun Razak which convened in 2004 appointed the Academy of Sciences Malaysia as the manager of the sciences programme that will be carried out by Malaysian's first Angkasawan at the International Space Station (ISS) in October 2007.

The National Space Agency (ANGKASA) as the recipient of the programme which is an offset of the purchase of the SU-30MKN planes by the Ministry of Defence from Russia, worked closely with the Academy, not only in the aspects of science but public awareness as well. Several exchange visits of Russian and Malaysian scientists were held in the context of science, public awareness and management of the programme in general.

Even though the Russians will launch the Malaysian Angkasawan to ISS, several other countries are also involved in the science programme , including USA, Canada, Italy and Spain. The programme is expected to cover life

akan meliputi sains biologi, sains fizikal, perubatan angkasa dan teknologi makanan.

KEM KREATIVITI SAINS-SENI

Sejajar dengan mandatnya untuk mempromosi kreativiti, Akademi telah menganjur dan membiayai bersama Kem Kreativiti Sains-Seni bersama UKM, Taman-taman Sabah, Balai Seni Lukis Negara dan UiTM.

Kem tersebut telah diadakan dari 4 hingga 8 Julai 2005 di Pulau Tiga, Sabah, bertujuan untuk mempromosi kreativiti melalui interaksi dua-hala antara para saintis dan artis. Berkisar sekitar tema 'Alun', Kem tersebut telah dihadiri oleh 56 peserta , 22 daripada mereka adalah saintis dari Akademi, Universiti dan Taman-taman Sabah dalam bidang kimia, geologi, fizik, biologi dan matematik. Peserta lain adalah dari bdang seni tampak, pentas dan sastera.

Kesemua aktiviti telah diatur supaya memaksimunkan interaksi antara semua peserta. Aktiviti ini merangkumi acara seni pentas, ekspedisi maritim, biologi, geologi dan kimia, serta kuliah berkaitan tema 'Alun'. Antara acara kemuncak ialah projek bersama yang dijalankan oleh kumpulan-kumpulan empat orang yang terdiri daripada artis dan saintis untuk menghasilkan pemasangan seni yang diperbuat daripada batu dan bahan semulajadi lain. Karya-karya seni ini telah diintegrasikan sebagai satu pemasangan taman di Pulau Tiga yang dipersembahkan sebagai hadiah kepada Taman-taman Sabah.

Satu lagi usahasama luar biasa ialah pementasan tarian di lumpur gunung berapi yang terdapat di pulau tersebut. Setiap peserta telah menghasilkan lukisan berkaitan dengan tema alun menggunakan bahan lukisan asas dan bahan lain yang terdapat di pulau. Setiap peserta juga dijangka akan menghasilkan karya yang akan dipamerkan di Balai Senil Negara pada 2006.

sciences, physical sciences, space medicine and food technology.

SCIENCE-ART CREATIVITY CAMP

In line with its mandate to promote creativity, the Academy jointly organised and sponsored the Science-Arts Creativity Camp with UKM, Sabah Parks, the National Arts Gallery and UiTM.

The camp was held from 4 to 8 July 2005 at Pulau Tiga , Sabah, with the objective of promoting creativity through two-way interactions between artists and scientists. Revolving around the theme "Alun " meaning wave or cycle, it was attended by 56 paticipants, 22 of whom were scientists from the Academy, Universities and Sabah Parks in the field of chemistry, geology, physics, biology and mathematics. The other participants were from the fields of visual, performing and literary arts.

Activities were organised around theme that would ensure maximum interaction between all participants and spanned performing arts events, maritime, biological, geological and chemistry related expeditions, and lectures related to the theme, "Alun". Among the highlights of the camps was a joint project where groups of four participants, containing both artists and scientists, combined efforts to produce artistic installations from rocks and other natural ingredients. The artistic works were integrated as a garden installation of Pulau Tiga and presented to Sabah Park.

Another unusual joint effort was the artistic performance in the mud volcano found on the island. Each participant also produced a painting related to the theme of waves and cycles using basic art material and those found in nature. Each participant is expected to produce a piece of work to be exhibited at the National Art Gallery in 2006.



Program Kesedaran Sains

Science Awareness Programme

Memandangkan masa depan negara bergantung kepada generasi muda hari ini, adalah amat penting untuk memastikan pengasuhan mereka sejak kecil bermula dengan asas sains dan teknologi dan menjadi tanggungjawab bersama bagi melengkapkan mereka dengan kebolehan untuk memenuhi cabaran dan mencapai kejayaan sebagai pemimpin hari esok. Oleh yang demikian, Akademi meneruskan misinya untuk meningkatkan kesedaran sains dan teknologi di kalangan generasi muda, dan mewujudkan minat mempelajari mata pelajaran sains dan seterusnya meneruskan kerjaya dalam bidang sains. Untuk tujuan tersebut pelbagai program telah dijalankan oleh Akademi.

As the future of our nation lies with today's young generation, it is essential to nurture them from the beginning on a right foundation in science and technology and equip them to meet the challenges that are ahead and thrive as the leaders of tomorrow. Thus the Academy continues on a mission to create science awareness and generate interest to learn science and pursue a career in science among the young. Various programmes are conducted to this effect, ranging from school activities to programmes for the public.

SIRI SYARAHAN "*ASM EMINENT PERSONS*"

Academician Dato' Ir. Lee Yee Cheong FASc telah menyampaikan syarahan *"ASM Eminent Person"* yang bertajuk *"Enginners, Engineering and Millenium Development Goals (MDG)" pada* 20 Mei 2005 di Institut Asia-Eropah. Syarahan yang dihadiri oleh 70 peserta membentangkan mengenai peranan penting SET di dalam membantu negara-negara membangun mencapai MDG melalui kerjasama Selatan-Selatan. Pertubuhan Bangsa-bangsa Bersatu akan menghasilkan pelan tindakan pada tahun 2005 untuk melaksanakan MDG bagi mengurangkan kemiskinan, mengurangkan kelaparan, memberi bantuan perubatan kepada mangsa penyakit pandemik dan menghalang kerosakan alam sekitar. Syarahan tersebut memberi banyak maklumat kepada para peserta mengenai *Millennium Project* (MP) 2002–2005 yang dilaksanakan oleh Pertubuhan Bangsa-bangsa Bersatu.

Sebagai memenuhi permintaan untuk mengedarkan maklumat mengenai MDG kepada masyarakat umum, Akademi menjemput universiti dan institusi pengajian tinggi untuk bersama menganjurkan syarahan tersebut. Kolej Unversiti Tun Hussein Onn (KUiTHO), Universiti Malaya, Kolej Universiti Sains dan Teknologi Malaysia (KUSTEM) dan Universiti Islam Antarabangsa (UIA) telah memberi maklum balas mengenai jemputan tersebut dan hingga kini YBhg. *Academician* Dato' Ir. Lee Yee Cheong FASc telah memberi kuliah di KUiTHO.

SIRI SYARAHAN PERDANA ASM

Akademi Sains Malaysia telah menganjurkan satu Syarahan *Inaugural* oleh Profesor Dr. Victor K.E. Lim FASc pada 26 February 2005. Beliau menyampaikan syarahan mengenai "*Emerging Infections in South-East Asia*". Kuliah diadakan di

ASM EMINENT PERSONS LECTURE SERIES

Academician Dato' Ir Lee Yee Cheong FASc delivered his ASM Eminent Persons Lecture entitled 'Engineers, Engineering and Millennium Development Goals (MDGs)' on 20 May 2005 at Asia-Europe Institute. The lecture which was attended by 70 participants presented the crucial role of SET in helping developing countries achieve MDGs through South-South collaboration. The UN will formulate an action plan in 2005 to implement the MDGs to alleviate poverty, reduce hunger, provide medical care to victims of pandemic diseases and arrest further environmental degradation. The lecture on the Millennium Project (MP) 2002-2005 conducted by the United Nations was very informative and educational to the participants.

In response to the request to make information on MDGs available to the public, the Academy invited universities and higher learning institutions to co-organise the lecture. Kolej Universiti Tun Husein Onn (KUiTHO), University of Malaya, Kolej Universiti Sains dan Teknologi Malaysia (KUSTEM) and International Islamic University (IIU) had responded to the invitation and to date YBhg Academician Dato' Ir Lee Yee Cheong FASc has successfully delivered his lecture at KUiTHO.

ASM INAUGURAL LECTURE SERIES

The Academy of Sciences Malaysia organised an Inaugural Lecture by Professor Dr. Victor K E Lim FASc on 26 February 2005. He delivered a lecture entitled "Emerging Infections in South East Asia." The lecture was held at the Institute of Medical

Institut Penyelidikan Perubatan dan dihadiri oleh 270 peserta dalam bidang akademik dan perubatan.

Syarahan Professor Dr. Victor Lim memberi fokus tentang punca penyakit yang menyebabkan infeksi di mana ia tidak begitu difahami tetapi ia bersifat kompleks dan *'multi-factorial'* yang melibatkan mikrobilogi, faktor sosio-ekonomi persekitaran. Syarahan ini juga turut mengutarakan ciri-ciri mikrob yang amat bermanfaat dan sentiasa berupaya memperolehi faktor virulen yang baru, menyesuaikan diri kepada persekitaran/ hos baru, menukar antigen mereka serta memperolehi ketahanan antimikrobial.

SIRI SYARAHAN UMUM ASM

Akademi Sains Malaysia dengan kerjasama Universiti Putra Malaysia menganjurkan satu Syarahan Umum bertajuk *"Opportunites, Challenges and New Perspective in Natural Products Research and Development"* pada 16 Februari 2005 di IDEAL, Universiti Putra Malaysia. Syarahan tersebut disampaikan oleh Prof Kurt Hostettman dari *University of Geneva.* Sejajar dengan lawatan beliau, Akademi juga mengadakan satu sesi dialog di kalangan penyelidik Malaysia dalam bidang Produk Asli Kimia untuk membincangkan isu-isu berkaitan teknologi, penyelidikan dan pembangunan di Malaysia. Sesi dialog diadakan pada 6 Februari 2005 di Makmal Produk Asli, Institut Biosains, Universiti Putra Malaysia.

Satu lagi Syarahan Umum telah dianjurkan bersama oleh Akademi Sains Malaysia dan Universiti Putra Malaysia pada 20 April 2005. Syarahan bertajuk *"Intelligent Machines for Precision Farming"* telah disampaikan oleh Profesor Simon Blackmore dari *Centre for Precision Farming, Royal Veterinary and Agricultural University*, Denmark. Syarahan ini memberi fokus kepada kebun persendirian dan keperluannya, di mana setiap kebun dianalisa

Research and attended by 270 participants from both the academic and medical fields.

Professor Dr Victor Lim's lecture highlighted the reasons for emerging infections which are not completely understood as they appear to be complex and multi-factorial involving microbiological, environmental and socio-economic factors. The lecture further highlighted the characteristics of microbes which are extraordinarily resourceful and constantly able to acquire new virulent factors, adapt to new environments/ hosts, change their antigens and acquire antimicrobial resistance.

ASM PUBLIC LECTURE SERIES

The Academy of Sciences Malaysia with the collaboration of Universiti Putra Malaysia organised a Public Lecture entitled 'Opportunites, Challenges and New Perspective in Natural Products Research and Development' on 16 February 2005 at IDEAL, Universiti Putra Malaysia. The lecture was delivered by Profesor Kurt Hostettman from University of Geneva. In conjunction with his visit, the Academy also organised a dialogue session among Malaysian researchers from the field of Natural Chemical Products to discuss isues related to technology, research and development in Malaysia. The dialogue session was held on 6 February 2005 at the Natural Products Laboratory, Biosciences Institute, Universiti Putra Malaysia.

Another Public Lecture was jointly organised by the Academy of Sciences Malaysia and Universiti Putra Malaysia on 20 April 2005. The lecture entitled 'Intelligent Machines for Precision Farming' was delivered by Professor Simon Blackmore from Centre for Precision Farming, Royal Veterinary and Agricultural University, Denmark. Precision Farming focuses on the individual farm and its needs, and every single field is carefully analysed using modern

secara terperinci menggunakan teknologi seperti sistem '*global positioning*', fotografi digital udara dan penginderaan jauh serta peralatan pengurusan pentadbiran seperti statistik hasil. Syarahan Umum ini dihadiri oleh 70 peserta.

technology, such as global positioning system, digital air photography and remote sensing as well as traditional land surveys and administrative management tools such as yield statistics. The public lecture was attended by 70 participants.

Dalam siri syarahan yang sama, Akademi Sains Malaysia telah menjemput Prof Dr Wayne L. Myers menyampaikan syarahan di *Malaysian Centre for Remote Sensing* (MACRES) pada 30 September 2005 di bawah Program Budaya Kecemerlangan. Prof Myers merupakan Professor dalam bidang Perhutanan Biometrik dan Pengarah di *Office for Remote Sensing and Spatial Information Resources* di *Pennsylvania State University*. Beliau kini sedang di dalam cuti sabatikal dari *Pennsylvania State University* sebagai Felo Penyelidik di KUSTEM, Terengganu. Prof Myers menyampaikan syarahan bertajuk *"Macroscopes vs. Microscopes: The Multi-scale Science of Environment" di MACRES.*

The Academy of Sciences Malaysia extended an invitation to Prof Dr Wayne L. Myers to deliver a lecture at the Malaysian Centre for Remote Sensing (MACRES) on 30th September 2005 under its 'Fostering a Culture of Excellence Programme'. Prof Myers is a Professor of Forest Biometrics and Director of Office for Remote Sensing and Spatial Information Resources at the Pennsylvania State University. He is currently on sabbatical leave from Pennsylvania State University as a Research Fellow at KUSTEM, Terengganu. Prof Myers delivered a lecture on "Macroscopes vs. Microscopes: The Multi-scale Science of Environment" at MACRES.

Syarahan Umum ini dihadiri seramai lebih kurang 90 peserta yang terdiri daripada pegawai MACRES serta pegawai dari Kementerian dan institusi seperti Kementerian Alam Sekitar dan Sumber Asli, JPSM, Perhilitan, FRIM, MPOB, MRB dan UPM. Syarahan Prof Myers merangkumi bidang yang luas dan beliau menyampaikan satu syarahan yang informatif. Beberapa peserta turut membincangkan mengenai teknologi *Geographic Information Systems* (GIS) yang memainkan peranan penting dalam organisasi kerajaan dan badan perniagaan.

The Public Lecture was well attended by about 90 persons mainly comprising MACRES Officers along with those from other Government Ministries / institutions such as Ministry of Natural Resources and Environment (MNRE), JPSM, Perhilitan, FRIM, MPOB, MRB and UPM. Prof Myers covered many broad areas and presented a very informative lecture. Some of the applications discussed were the GIS (Geographic Information Systems) technologies that serve important roles for many government organisations and commercial enterprises.

KUIZ DAN PROJEK SAINS NASIONAL DUMEX

Semenjak tahun 2004, pelajar sekolah rendah dari seluruh negara berpeluang untuk mempelajari sains dengan cara yang lebih menyeronokkan dengan adanya Kuiz dan Projek Sains Kebangsaan Dumex & Fiesta Rakan Esti. Pada tahun ini, program telah dirasmikan oleh YB. Datuk Profesor Dr. Mohd. Ruddin Abdul Ghani, Setiausaha Parlimen, Kementerian Sains, Teknologi dan Inovasi pada 10 Mac 2005 di SK Taman Melati, Kuala Lumpur. Program bergerak yang bermula di Kuala Lumpur berakhir di Sibu, Sarawak pada 25 Mei 2005.

Program ini dianjurkan oleh Akademi Sains Malaysia, Kementerian Sains, Teknologi dan Inovasi dan Kementerian Pendidikan dan disokong oleh DUMEX (Malaysia) Sdn. Bhd. Acara utama Fiesta adalah "Kuiz Sains Nasional Dumex" untuk pelajar tahun tiga dan ke bawah dan "Projek Sains Nasional DUMEX" untuk Tahun 4 - 6. Ia memberi peluang kepada para pelajar untuk menunjukkan bakat mereka.

DUMEX NATIONAL SCIENCE QUIZ AND SCIENCE PROJECT 2005

Since 2004, primary school students throughout the nation have the opportunity to learn about science in an exiting way during the "Dumex National Science Quiz and Science Project & Rakan Esti Fiesta". This year the programme was officiated by YB Datuk Professor Dr Mohd Ruddin Ab. Ghani, Parliamentary Secretary, Ministry of Science, Technology and Innovation on 10 March 2005 at SK Taman Melati, Kuala Lumpur. The road tour which started in Kuala Lumpur, ended in Sibu, Sarawak on 25 May 2005.

The programme is organised by the Academy of Sciences Malaysia, Ministry of Science, Technology & Innovation and Ministry of Education and supported by DUMEX (Malaysia) Sdn Bhd. The crest of the Fiesta will be the 'DUMEX National Science Quiz' for Year 3 and below and the 'DUMEX National Science Project' for Years 4 – 6. It provides an opportunity for our young learners to unleash their talents.



Dato' Dr Abdul Aziz S.A Kadir menemani Dato' Haji Kusaini Haji Hasbullah melawat tapak projek sains.
Dato' Dr Abdul Aziz S.A Kadir accompaning Dato' Haji Kusaini Haji Hasbullah to visit the Science Project Booth.



Pemenang Kuiz dan Projek Sains Nasional 2005 di London.
Winners of National Science Quiz and Science Project 2005 at London.

Pemenang kedua-dua kategori kuiz dan projek dari 15 buah negeri bertanding di peringkat akhir yang diadakan dari 31 Julai – 3 Ogos 2005 di Pusat Sains Negara. Selain daripada pertandingan, penganjur juga telah mengadakan program lawatan sambil belajar selama sehari semasa pelajar berada di Kuala Lumpur. Pelajar melawat Universiti Multimedia, Putrajaya dan kilang DUMEX di Nilai.

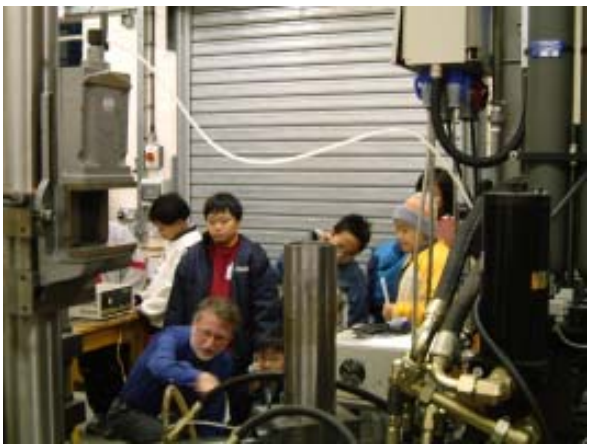
The champions of both quiz and project category from all the 15 states met during the grand finals held from 31 July – 3 August 2005 at the National Science Centre. Apart from the competition itself, the organisers had also organised a-one day study visit programme while they were in Kuala Lumpur. The students visited the Multimedia University, Putrajaya and the Dumex factory in Nilai.

Acara penutup dan penyampaian hadiah disempurnakan oleh YBhg. Dato' Haji Kusaini Haji Hasbullah, Timbalan Ketua Pengarah Jabatan Sekolah, Kementerian Pelajaran Malaysia pada 3 Ogos 2005. Kuiz Sains Nasional DUMEX 2005 dimenangi oleh SJK (C) Sam Tet, Ipoh manakala Projek Sains Nasinal DUMEX dimenangi oleh SJK (C) Chung Hwa, Kota Kinabalu. Kedua-dua sekolah memenangi "Trofi Cabaran Akademi Sains Malaysia", lawatan sambil belajar ke London, dan wang tunai RM 2000 kepada sekolah.

The closing and prize giving ceremony was graced by YBhg Dato' Haji Kusaini Haji Hasbullah, Deputy Director General School Department, Ministry of Education Malaysia on 3 August 2005. The DUMEX National Science Quiz 2005 was won by SJK (C) Sam Tet, Ipoh while the DUMEX National Science Project was won by SJK (C) Chung Hwa, Kota Kinabalu. Both winners won the "Academy of Sciences Malaysia Challenge Trophy", Study Visit to London, and Cash Prize of RM 2000 for the school.

Para pemenang berpeluang melawat pelbagai tempat menarik semasa lawatan ke London dari 27 November – 2 Disember 2005 seperti *Kew Gardens, Science Museum, Madame Tussaud, Planetarium, National Maritime Museum, Museum of London* dan Pusat Penyelidikan Tun Abdul Razak.

The champions had the opportunity to visit many interesting places in London from 27 November – 2 December 2005 such as Kew Gardens, Science Museum, Madame Tussaud and Planetarium, National Maritime Museum, Museum of London and the Tun Abdul Razak Research Centre.



Peserta di makmal kejuruteraan Pusat Penyelidikan Tun Abdul Razak.
Participants at the engineering lab, Tun Abdul Razak Research Centre.



Demonstrasi oleh Dr. Steve Stuart tentang ciri-ciri getah di Pusat Tun Abdul Razak.
Demonstration by Dr. Steve Stuart on characteristics of rubber at Tun Abdul Razak Centre.

Secara keseluruhannya didapati, minat para guru dan para pelajar semakin meningkat untuk mengambil bahagian dalam pertandingan ini. Buat masa ini setiap negeri akan menamakan 30 kumpulan untuk kuiz dan 15 kumpulan untuk projek sains. Tahun ini Akademi menerima beberapa permintaan dari sekolah supaya Fiesta Rakan Esti dianjurkan di sekolah mereka dan juga untuk menambahkan jumlah penyertaan.

Overall, the programme saw increasing interest among teachers and students to participate in this competition. Currently, each state will nominate 30 teams for quiz and 15 teams for the science project. This year the Academy received several requests from schools to host the Rakan Esti Fiesta in their schools and to increase the number of participating teams.

KUIZ SAINS NASIONAL 2005

Sekali lagi, Akademi Sains Malaysia menganjurkan Kuiz Sains Nasional dengan kerjasama Kementerian Sains, Teknologi dan Inovasi, Kementerian Pelajaran dan Novozymes Malaysia Sdn Bhd. Tahun ini sebanyak 1408 sekolah mengambil bahagian dalam Kuiz Sains Nasional, merangkumi kesemua 15 negeri. Pusingan pertama iaitu ujian bertulis dilaksanakan di seluruh negara pada 23 April 2005, peringkat negeri pada 25 Jun 2005 dan peringkat zon pada 19 Ogos 2005.

Empat pemenang peringkat zon yang bertanding di peringkat akhir adalah SM Sains Tun Syed Sheh Shahbudin, Bukit Mertajam, Pulau Pinang, SMK St. Michael, Ipoh, Perak, SMK Labuan, WP Labuan dan SMK (L) Methodist, Kuala Lumpur. Peringkat akhir Kuiz Sains Nasional 2005 telah diadakan di Auditorium, Bahagian Teknologi Pendidikan, Kementerian Pelajaran Malaysia. Acara tersebut telah dihadiri oleh YB. Dato' Kong Cho Ha, Timbalan Menteri, Kementerian Sains, Teknologi dan Inovasi. Pemenang Kuiz Sains Nasional 2005 adalah SMK (L) Methodist, Kuala Lumpur dan pelajar terbaik adalah Chiong Khai Xiang yang juga dari SMK (L) Methodist, Kuala Lumpur. Pemenang mendapat Trofi Cabaran Perdana Menteri, lawatan sambil belajar ke Sweden dan Denmark, sijil dan hadiah tunai.

Tahun ini menyaksikan penambahan dari segi bilangan sekolah yang mengambil bahagian

NATIONAL SCIENCE QUIZ 2005

Once again, the Academy of Sciences Malaysia organised the National Science Quiz in collaboration with the Ministry of Science, Technology and Innovation, Ministry of Education and Novozymes Malaysia Sdn Bhd. Reaching out to all the 15 states, this year, 1408 schools participated in the National Science Quiz. The first round of written test was conducted throughout Malaysia on 23 April 2005, State level on 25 June 2005 and the Zone Level on 16 August 2005.

The winners of the four Zone Levels who competed at the finals are SM Sains Tun Syed Sheh Shahbudin, Bukit Mertajam, Pulau Pinang, SMK St Michael, Ipoh, Perak, SMK Labuan, WP Labuan and SMK (L) Methodist, Kuala Lumpur. The finals of The National Science Quiz 2005 was held at the Auditorium, Bahagian Teknologi Pendidikan, Ministry of Education Malaysia. The event was graced by YB Dato' Kong Cho Ha, Deputy Minister, Ministry of Science, Technology and Innovation. The winner of the National Science Quiz for the year 2005 was SMK (L) Methodist, Kuala Lumpur and the best student award went to Chiong Khai Xiang also from SMK (L) Methodist, Kuala Lumpur. The champions walked away with the Prime Minister's Challenge Trophy, a study visit to Sweden and Denmark, Certificate and a Cash Prize.

This year saw an increase in the number of participating schools despite the introduction of



Pemenang Kuiz Sains Kebangsaan 2005 menerima Trofi Cabaran Perdana Menteri daripada YB Dato' Khong Cho Ha.
The National Science Quiz 2005 winner receiving the 'Prime Minister's Challenge Trophy' from YB Dato' Khong Cho Ha.



walaupun soalan kuiz dalam Bahasa Inggeris dilaksanakan buat pertama kalinya. Akademi juga sedang merancang untuk mengubah format kuiz dan soalan, di mana soalan-soalan akan dipaparkan pada skrin komputer bagi membolehkan para penonton turut mendapat manfaat daripada kuiz tersebut. Bermula pada tahun hadapan, semua soalan akan diberikan di dalam Bahasa Inggeris.

questions in the English language. The Academy is also in the midst of revamping the format of the quiz and the questions. The questions will be computerised so as to enable the audience to benefit as well. Beginning next year, all questions will be in English.

LAWATAN SAMBIL BELAJAR KE STOCKHOLM DAN COPENHAGEN BAGI PEMENANG KUIZ SAINS NASIONAL 2005

2005 merupakan tahun ke-5 Akademi Sains Malaysia menghantar pemenang Kuiz Sains Nasional untuk mengikuti lawatan sambil belajar ke Stockholm, Sweden dan Copenhagen, Denmark. Lawatan ini bermula dari 5 – 16 Disember 2005. Delegasi kali ini terdiri daripada Prof Khalijah Mohd Salleh, Felo Akademi Sains Malaysia selaku Ketua Delegasi, Tengku Sharizad Tengku Dahlan, Pegawai Sains Kanan Akademi Sains Malaysia, pemenang Kuiz Sains Nasional 2005 dari *Methodist Boys School*, Kuala Lumpur – Chiong Khai Xiang, Mohd Nazshua Mohd Irwan Serigar and Leong Chun Hoong serta guru pengiring Cik Chan Seok Choo.

STUDY VISIT TO STOCKHOLM AND COPENHAGEN FOR 2005 NATIONAL SCIENCE QUIZ WINNERS

This year is the fifth year the Academy of Sciences Malaysia sent the winners of the National Science Quiz for a study visit to Stockholm, Sweden and Copenhagen, Denmark. The visit was from 5 -16 December 2005. The delegation comprised Prof Prof Khalijah Mohd Salleh, Fellow of Academy of Sciences Malaysia and Head of Delegation, Tengku Sharizad Tengku Dahlan, Senior Scientific Officer, Academy of Sciences Malaysia, the winners of the 2005 National Science Quiz from Methodist Boys School, Kuala Lumpur – Chiong Khai Xiang, Mohd Nazshua Mohd Irwan Serigar and Leong Chun Hoong together with the teacher Ms Chan Seok Choo.

Delegasi Malaysia berpeluang mengikuti Syarahan Nobel mengenai *"The Bacterium Helicobacter pylori and its Role in Gastritis and Peptic Ulcer Disease"* oleh Pemenang Anugerah Nobel dalam bidang Fisiologi atau Perubatan – Prof Barry J. Marshall dan Prof Robin Warren. Syarahan tersebut diadakan di Karonslika Institut. Delegasi turut menghadiri Syarahan Nobel oleh Pemenang Anugerah Nobel dalam bidang Fizik yang diadakan di Stockholm Universiti. Prof Roy J. Glauber menyampaikan syarahan mengenai "*100 years of Light Quanta*", Prof John Hall menyampaikan Syarahan Nobelnya yang bertajuk *"Defining and Measuring Optical Frequencies"* manakala Prof Theodore W. Hansch menyampaikan syarahan bertajuk "*A Passion for Precision*". Syarahan Nobel tersebut memberi inspirasi disamping informasi yang amat berguna. Acara utama lawatan ini adalah Upacara Penganugerahan Hadiah Nobel di *Stockholm Concert Hall* pada 10 Disember 2005. Para pelajar berpeluang menyaksikan penyampaian anugerah tertinggi dalam bidang sains dengan harapan ia akan menjadi inspirasi kepada mereka untuk mencapai kecemerlangan dalam bidang sains.

The Malaysian delegation had the opportunity to attend the Nobel Lecture on "The Bacterium Helicobacter pylori and its Role in Gastritis and Peptic Ulcer Disease" by the 2005 Nobel Prize winners in Physiology or Medicine - Prof Barry J. Marshall and Prof Robin Warren. The lecture was held at Karolinska Institute. The delegation also attended the Nobel Lectures by the 2005 Nobel Prize winners in Physics, held at Stockholm University. Prof Roy J. Glauber presented a lecture on '100 Years of Light Quanta'; Prof John Hall delivered his Nobel Lecture on 'Defining and Measuring Optical Frequencies' and Prof Theodore W. Hansch gave a lecture on "A Passion for Precision". The Nobel Lectures were both inspiring and informative. The highlight of the visit was their attendance at the Nobel Prize Award Ceremony at the Stockholm Concert Hall on 10 December 2005. The students were given an opportunity to witness the presentation of the highest accolade given to a scientist with the hope that it would serve as an inspiration for them to achieve excellence in science.

Delegasi juga melawat *Swedish Institute of Computer Science* (SCIS), ibu pejabat Ericsson dan Scania AB. Di Copenhagen, delegasi mengadakan lawatan ke ibu pejabat

The delegation also visited the Swedish Institute of Computer Science (SICS), Ericsson headquarters and Scania AB. In Copenhagen, the delegation visited Novozymes headquarters where a briefing



Deligasi bersama Nobel Laureate John L. Hall.
Deligation with Nobel Laureate John L. Hall.



Lawatan ke Ibu pejabat Novozyme di Copenhagen.
Visit to Novozyme headquarters in Copenhagen.

Novozymes di mana taklimat mengenai latarbelakang syarikat, aktiviti utama, penyelidikan dan pembangunan serta halatuju syarikat diberikan. Secara keseluruhannya, lawatan ke Stockholm dan Copenhagen memberi manfaat yang banyak kepada semua delegasi secara amnya dan pelajar khususnya kerana ia telah memberi peluang untuk menyaksikan penyampaian hadiah sains terunggul di dunia dan berjumpa serta berinteraksi secara langsung dengan Pemenang Anugerah Nobel. Ia diharapkan dapat menyuntik semangat dan menanam minat para pelajar untuk mencapai kecemerlangan dalam bidang sains. Lawatan ke organisasi dan industri S&T pula telah memberi peluang untuk mempelajari perkembangan terkini dan sumbangan sains dan teknologi kepada industri dan negara. Lawatan ini telah membuka minda dan pandangan peserta tentang erti kecemerlangan sains.

was given on the company's background, core activities, research and development and future directions. On the whole, the visit to Stockholm and Copenhagen gave tremendous benefits to the delegation in general and the students in particular because it gave an opportunity to witness the presentation of the most prestigious scientific award in the world and to meet and interact with the Laureates in person. It is hoped that this will instill the spirit and spur interest to pursue and achieve excellence in science. The visit to the S&T organisations and industries gave the opportunity to learn about the latest developments in and contribution of science and technology to the industries and the nation. The visit opened the minds and eyes of the participants to excellence in science.

PROGRAM *LA MAIN A LA PATE*

Akademi Sains Malaysia telah mengadakan perbincangan dengan SEAMEO-RECSAM bersama dengan wakil daripada Pusat Pembangunan Kurikulum, Kementerian Pelajaran mengenai projek kerjasama pendidikan sains pada 9 Ogos 2005. Akademi diwakili oleh *Academician* Dato' Ir. Lee Yee Cheong FASc dan Prof. Khalijah Mohd. Salleh FASc. Perbincangan bertumpu kepada program *La Main a la Pate,* program pendidikan sains dan aktiviti yang dijadualkan untuk tahun 2006 serta penglibatan dalam Bengkel InterAcademy (IAP) mengenai *"Evaluation of Inquiry Based Science Education Projects"* yang diadakan di Stockholm pada September 2005.

LA MAIN A LA PATE PROGRAMME

The Academy of Sciences Malaysia had a discussion with SEAMEO-RECSAM together with a representative from Curriculum Development Centre, Ministry of Education on collaborative projects in science education on 9 August 2005.The Academy was represented by Academician Dato' Ir Lee Yee Cheong FASc and Prof Khalijah Mohd Salleh FASc. The discussion focused on La Main a La Pate programme, science education programmes and activities planned for year 2006 and also the participation in the Inter Academy (IAP) Workshop on Evaluation of Inquiry Based Science Education Projects held in Stockholm in September 2005.

PERSIDANGAN ANTARABANGSA PENDIDIKAN SAINS DAN MATEMATIK 2005

Akademi Sains Malaysia turut bekerjasama dalam perlaksanaan 'Persidangan Antarabangsa Pendidikan Matematik dan Sains 2005' yang dianjurkan oleh SEAMEO-RECSAM. Persidangan diadakan dari 5-8 Disember 2005 di RECSAM, Pulau Pinang yang bertemakan "*Bridging the Theory – Practice Gap in Science and Mathematics Education: The Challenge to Change*". Di antara objektif persidangan adalah untuk menyediakan satu forum bagi mengkaji semula isu, bertukar idea dan berkongsi pengalaman khususnya mengenai jurang di antara teori dan perlaksanaan pengajaran sains dan matematik pada semua peringkat, untuk mengkaji semula penggunaan ICT bagi mengurangkan jurang teori-perlaksanaan dalam pengajaran sains dan matematik, mengkaji semula dan meningkatkan pembangunan professional secara berterusan sebagai satu cara untuk merapatkan jurang teori-perlaksanaan di dalam promosi pendidikan sains dan matematik.

SIRI SYARAHAN STERLING

Akademi Sains Malaysia, Institut Kejuruteraan Malaysia dan Universiti Multimedia telah menganjurkan Siri Syarahan *Sterling* 2005 oleh *Sterling Group of British Universities* dengan kerjasama KBU *International College* dan Universiti Putra Malaysia pada 14-16 Mac 2005. Kuliah pertama pada 14 Mac 2005 bertajuk *"New Materials – Whither Bound?"* telah disampaikan oleh Profesor William M. Banks, Jabatan Kejuruteraan Mekanikal, *University of Strathclyde* kepada 260 pelawat.

Syarahan beliau telah menunjukkan banyak pembangunan baru dan pelbagai potensi aplikasi '*Material World*'. Kuliah meliputi pelbagai bidang seperti nano hinggalah ke skala makro yang merangkumi barang-barang

INTERNATIONAL CONFERENCE ON SCIENCE AND MATHEMATICS EDUCATION 2005

The Academy of Sciences Malaysia is one of the collaborators for the International Conference on Mathematics and Science 2005 which was organized by SEAMEO-RECSAM. The conference was held from 5 – 8 December 2005 in RECSAM, Pulau Pinang and themed "Bridging the Theory – Practice Gap in Science and Mathematics Education: The Challenge to Change." Among the objectives of the Conference were to provide a forum to review issues, exchange ideas and share experiences especially on the gaps between the theory and practice of science and mathematics instruction at all levels, to review the use of ICT to bridge the theory-practice gaps in the teaching of science and mathematics, to review and enhance continuous professional developments as a means to bridge the theory-practice gaps in the promotion of science and mathematics education.

STERLING LECTURE SERIES

The Academy of Sciences Malaysia, Institute of Engineers Malaysia and Multimedia University organised the Sterling Lecture Series 2005 by Sterling Group of British Universities with the collaboration of KBU International College and Universiti Putra Malaysia from 14-16 March 2005. The first lecture on 14 March 2005 entitled "New Materials – Whither Bound?" was delivered by Professor William M Banks, Department of Mechanical Engineering, University of Strathclyde to an audience of 260 people.

His lecture showed the many new developments and the range of application potential of the 'Material World'. The lecture covered areas ranging from nano scale to the macro scale which covered everyday items like furniture and kitchen

seharian seperti perabot dan peralatan dapur sehinggalah ke kapal angkasa yang lebih eksotik. Profesor Rob Thring dari Jabatan Kejuruteraan *Aeronautical* dan Otomotif, *University of Loughborough* menyampaikan syarahan mengenai *"PEM Fuel Cells for the Transportation Application"* di Universiti Putra Malaysia. Syarahan tersebut mengkaji semula motivasi untuk berubah kepada *'Fuel Cells'* untuk kuasa pengangkutan serta corak *'take-up'* yang mungkin dan juga memberi fokus kepada jenis *'Fuel Cells'* yang berpotensi untuk diberi pertimbangan bagi aplikasi pengangkutan. Kuliah dihadiri 130 peserta.

utensils to the more exotic spacecraft. Professor Rob Thring from the Department of Aeronautical and Automotive Engineering, University of Loughborough delivered a lecture on "PEM Fuel Cells for the Transportation Application" at Universiti Putra Malaysia. The lecture reviewed motivation for a change to Fuel Cells for transportation power, and the likely take-up pattern and also highlighted the potential types of Fuel Cell to be considered for transportation application. It was attended by 130 participants.

Syarahan ketiga oleh Profesor Michael J. Kearney dari *School of Electronics and Physical Sciences, University of Surrey* telah dianjurkan pada 16 Mac 2005 di KBU *International College*. Beliau menyampaikan syarahan bertajuk *"Silicon Microelectronic: Challenges for the Next 50 Years"* yang mengutarakan pembangunan silikon mikroelektronik yang sedang memasuki era baru di mana kaedah skala tradisional bagi mengecilkan lagi peralatan memerlukan idea teknologi baru, bahan baru, dan senibina peralatan. Syarahan tersebut merumuskan kepakaran pada masa kini dan membincangkan cabaran besar yang perlu ditangani jika kemajuan hendak dikekalkan. Syarahan *Sterling* ini memberi peluang kepada para peserta untuk memperolehi pengetahuan dan maklumat mengenai perkembangan terkini dalam bidang sains dan teknologi.

The third lecture was conducted on 16 March 2005 at KBU International College by Professor Michael J Kearney from the School of Electronics and Physical Sciences, University of Surrey. He delivered a lecture on 'Silicon Microelectronics: Challenges for the Next 50 Years' which highlighted the development of silicon microelectronics which is entering a new era wherein the traditional scaling approach to realising smaller and smaller devices needs to be supplemented by introducing new technological ideas, new materials and device architecture. The lecture summarised the present state of the art and discussed the grand challenges which need to be overcome if progress is to be maintained. The Sterling Lectures provided an opportunity to the participants to obtain knowledge and information on current developments in science and technology.

PROGRAM SAINS ASM-INTEL

Di bawah Program Sains ASM-Intel, kursus latihan untuk sekolah-sekolah berasrama penuh di bawah Kementerian Pelajaran bermula pada 25 Februari 2005. Fasilitator dari SIRIM, Universiti Malaya dan Universiti Multimedia terlibat dalam kursus latihan ini, diikuti dengan Bengkel Penghakiman MRSM di Kuala Lumpur dan Langkawi. Acara utama program adalah *"2005 Intel International Science and Engineering*

ASM-INTEL SCIENCE PROGRAMME

Under the ASM-Intel Science Programme, year 2005 began with a training course for the residential schools under the Ministry of Education on 25 February 2005. Facilitators from SIRIM, University of Malaya and Malaysian Multimedia University participated in the training course. This was followed by MRSM Judges Workshops in Kuala Lumpur and Langkawi. The highlight of the programme was the 2005 Intel

Fair (ISEF)" yang diadakan di Phoenix, Arizona, Amerika Syarikat dari 8-13 Mei 2005. Intel ISEF merupakan acara sains terbesar dunia bagi pra-kolej. Intel ISEF memberi peluang kepada saintis muda terbaik dari seluruh dunia untuk berkongsi idea, mempamerkan projek sains tercanggih dan bersaing untuk anugerah dan biasiswa bernilai lebih USD3 juta.

International Science and Engineering Fair (ISEF) which was held in Phoenix, Arizona, USA from 8 – 13 May 2005. The Intel ISEF is the world's largest pre-college celebration of science. The Intel ISEF provides an opportunity for the best young scientists from around the globe to share ideas, showcase cutting-edge science projects, and compete for over USD3 million in awards and scholarships.

Tahun ini, Malaysia menghantar tiga projek ke Intel ISEF iaitu "*Rambutan Ink from Fruit Rinds of Naphelium lappaceum*" oleh Esther Chiew Yee Chiong dari Sekolah Menengah Kebangsaan Batu Lintang, Kuching. "*From Household Waste to Garden Gold, Phase Two*" oleh Sean Chang SungWong dan Kelvin Tak Lek Chiong dari Sekolah Menengah Kebangsaan Batu Lintang, Kuching dan *"Conversion of Hazardous Petrochemical Sludge Waste as a New High Dielectric Constant Material"* oleh Khairul Ihsan Taib, Ahmad Syafiq Ahmad Hazmi dan Nurul Farhana Zulkifli dari Maktab Rendah Sains MARA, Taiping. Projek yang pertama mendapat tempat ketiga *'Grand Award'* bagi projek individu dalam kategori kimia. Hadiah bagi kategori ini adalah bernilai USD1,000. Ini merupakan kemenangan projek 'sains tulen' pertama bagi Malaysia dan kemenangan ini membuktikan perkembangan ketara dalam keupayaan penyelidikan sains asas pelajar kita.

This year Malaysia sent three projects to Intel ISEF namely 'Rambutan Ink from Fruit Rinds of Naphelium lappaceum' by Esther Chiew Yee Chiong from Sekolah Menengah Kebangsaan Batu Lintang, Kuching; 'From Household Waste to Garden Gold, Phase Two' by Sean Chang Sung Wong and Kelvin Tak Lek Chiong from Sekolah Menengah Kebangsaan Batu Lintang, Kuching and 'Conversion of Hazardous Petrochemical Sludge Waste as a New High Dielectic Constant Material' by Khairul Ihsan Taib, Ahmad Syafiq Ahmad Hazmi and Nurul Farhana Zulkifli from MARA Junior Science College Taiping. The first project won the third place Grand Award for individual project in the category of chemistry. The prize for this award was USD1,000. This is the first 'pure science' win for Malaysia, and such wins demonstrate significant advancements in our student's basic science research abilities.

Pada setengah tahun kedua, Program Sains ASM-Intel telah menganjurkan Akademi Pengajar Sains MRSM dari 24- 28 Julai 2005 di Pontian, Johor. Ia diadakan sejajar dengan acara Tunas Saintis MRSM dan pemenang acara ini akan mewakili Malaysia di Intel INSEF tahun hadapan. Pesta Sains Kementerian Pelajaran dianjurkan pada bulan Ogos 2005 untuk memilih pemenang yang akan mewakili Malaysia ke Intel INSEF di Amerika Syarikat. Seterusnya tiga Kem Sains ASM-MOE-Intel telah diadakan di Pulau Pinang, Negeri Sembilan dan Sabah untuk guru-guru dengan tujuan utama untuk melatih para pelatih. Kem terakhir tahun 2005 diadakan di Kuala Lumpur pada bulan Disember bagi

For the second half of the year, ASM-Intel Science Programme was organised by the MRSM Science Educator Academy from 24 -28 July 2005 in Pontian, Johor. This was held in conjunction with the MRSM Tunas Saintis Programme and the winners of this event would represent Malaysia at the Intel ISEF next year. The Ministry of Education Science Fair was organised in August 2005 to select the winners to also represent Malaysia at the Intel ISEF in the US. Subsequently three ASM-MOE-INTEL Science Camps were held in Penang, Negeri Sembilan and Sabah for teachers specifically aimed at training the trainer. The last camp for 2005 was held in Kuala Lumpur in December for the finalists of the National

peserta terakhir Pesta Sains Nasional serta guru-guru mereka termasuk perwakilan Malaysia di Intel ISEF 2006. Terdapat 31 projek yang terlibat. Fasilitator di kem memberi tunjuk ajar kepada para pelajar bagaimana me-nambahbaik projek, mengajar kemahiran penyampaian serta berkongsi pengalaman sebagai penyelidik.

Science Fair and their teachers including Malaysia's representatives at Intel ISEF 2006. There were 31 projects involved. The facilitators at the camp guided the students on how to improve their projects, coached them on their presentation skills as well as shared their life experiences as researchers.



Pemenang tempat ke-3 dalam Kategori Kimia, Esther Chiong dari SMK Batu Lintang, Kuching, Sarawak.
3rd place Award Winner in the Chemistry Category, Esther Chiong from SMK Batu Lintang, Kuching, Sarawak.



Program Antarabangsa

International Programme

Dalam era K-ekonomi, adalah penting bagi Akademi untuk menjalinkan rangkaian dengan badan-badan organisasi sains antarabangsa. Rangkaian tersebut mampu meningkatkan keupayaan sains dan teknologi Negara untuk bersaing seiring dengan pembangunan sains dan teknologi dunia. Selain daripada menandatangani Memorandum Persefahaman dengan 'sister academy', Akademi Sains Malaysia juga terlibat dalam menyertai mesyuarat dan aktiviti-aktiviti yang dianjurkan oleh organisasi SET lain.

In the era of the knowledge economy, it is vital for the Academy to establish strong networks with international science organisations and sister Academies. These networks have increased opportunities for the sharing of knowledge, expertise as well as scientific and technological capabilities in order for the nation to remain competent in the context of global science and technology advancements. Apart from signing MOUs with international SET organisations and sister Academies, the Academy co-organises or contributes at conferences or meetings of international SET bodies.

MESYUARAT MAJLIS *FEDERATION OF ASIAN SCIENTIFIC ACADEMIES AND SOCIETIES (FASAS)*

Akademi Sains Australia menganjurkan Mesyuarat Majlis "*The Federation of Asian Scientific Academies and Societies (FASAS)*" di Canberra pada 8-9 September, 2005. Akademi Sains Malaysia diwakili oleh *Academician* Tan Sri Datuk Dr. Omar Abdul Rahman FASc, *Academician* Dato' Ir. Lee Yee Cheong FASc, Prof. Khalijah Mohd. Salleh FASc dan Encik Nasaruddin Rahman. *Academician* Tan Sri Datuk Dr. Omar Abdul Rahman FASc dan *Academician* Dato' Ir. Lee Yee Cheong FASc adalah masing-masing Presiden dan Setiausaha Agung FASAS.

Beberapa perkara dibincangkan semasa mesyuarat tersebut termasuk program kerja FASAS di bawah program pembangunan kapasiti IAP, program air FASAS dan IAP, kewangan dan lain-lain projek. Satu sesi '*brainstorming*' juga diadakan untuk mengenalpasti bagaimana FASAS dapat menyumbang kepada program peningkatan kapasiti dan program sains *Inter Academy Panel* (IAP). Ahli FASAS juga membincangkan isu kemusnahan akibat gempabumi dan tsunami pada Disember 2004 di Asia. Majlis FASAS bersetuju untuk mulakan tiga projek dalam masa 12 bulan iaitu *"Science Teaching with Enlightenment or Science Teaching in Enlightened Ways", "Education and Training for Science Teachers",* dan *"General Education on Natural Disasters".* Laporan kemajuan projek-projek tersebut akan di bentangkan di mesyuarat Majlis FASAS yang akan datang pada bulan Ogos 2006 di Singapura.

MESYUARAT TAHUNAN KE LIMA *BOARD OF THE INTER ACADEMY COUNCIL (IAC)*

Mesyuarat Tahunan Ke Lima Majlis *InterAcademy Council* (IAC) telah diadakan di *Royal Netherlands*

COUNCIL MEETING OF THE FEDERATION OF ASIAN SCIENTIFIC ACADEMIES AND SOCIETIES (FASAS)

The Australian Academy of Science hosted the 2005 Council Meeting of the Federation of Asian Scientific Academies and Societies (FASAS) in Canberra from 8-9 September, 2005. The Academy of Sciences Malaysia was represented by Academician Tan Sri Datuk Dr. Omar Abdul Rahman FASc, Academician Dato' Ir. Lee Yee Cheong FASc, Prof. Khalijah Mohd Salleh FASc and Mr. Nasaruddin Rahman. Academician Tan Sri Datuk Dr Omar Abdul Rahman FASC and Academician Dato' Ir Lee Yee Cheong FASc are FASAS President and Secretary General respectively.

Several items were discussed during the meeting including FASAS work programme under the IAP capacity building programme, FASAS and the IAP water programme, finance and other projects. A brainstorming session was also held on how FASAS could contribute to the Inter Academy Panel (IAP) programmes on capacity building and science education. FASAS members also discussed the issue of the devastation of the earthquake and tsunami in December, 2004 in the Asian region. FASAS Council agreed to undertake three projects in the next twelve months namely 'Science Teaching with Enlightenment or Science Teaching in Enlightened Ways', 'Education and Training for Science Teachers' and 'General Education on Natural Disasters'. The reports on the progress of the projects will be tabled at the next FASAS Council Meeting scheduled to be held in August, 2006 in Singapore.

FIFTH ANNUAL MEETING OF THE BOARD OF THE INTER ACADEMY COUNCIL (IAC)

The Fifth Annual Meeting of the Board of the Inter Academy Council (IAC) was held at the Royal

Academy of Arts and Sciences di Amsterdam pada 31 Januari - 2 Februari 2005. *Academician* Datuk Dr. Salleh Mohd. Nor FASc dan *Academician* Dato' Ir. Lee Yee Cheong FASc menghadiri mesyuarat masing-masing sebagai Ahli Lembaga Pengarah yang akan dilantik dan Ahli Lembaga Pengarah yang akan bersara. Akademi Sains Malaysia adalah ahli *Inter Academy Council*. Selain dari perwakilan akademi, mesyuarat juga dihadiri oleh jemputan khas dari *InterAcademy Medical Panel* dan projek *UN Millenium Goals*. Mesyuarat tersebut dipengerusikan oleh pengerusi bersama IAC, Bruce Alberts, Presiden *National Academy of Sciences Amerika Syarikat* dan Goverdhan Mehta, bekas presiden *Indian National Science Academy*.

Selain daripada memberi nasihat dan kepakaran kepada perbadanan antarabangsa, IAC juga berganding dengan organisasi saintifik lain seperti Bank Dunia dan Pertubuhan Bangsa-bangsa Bersatu dalam memainkan peranan ini. Di antara isu yang dibincangkan semasa mesyuarat termasuk strategi masa depan IAC, pembangunan kapasiti S&T, petunjuk S&T, penglibatan Pertubuhan Bukan Kerajaan dalam komuniti S&T, penglibatan wanita dalam S&T, bencana alam dan isu-isu global yang berkaitan. Tumpuan mesyuarat adalah kepada kajian IAC yang baru dan sedang dilaksanakan seperti sistem tenaga mampan, pembangunan semula universiti, mitigasi bencana alam, isu kesihatan global dan isu air. Melalui kajian-kajian ini, IAC dapat memenuhi peranannya untuk mengumpulkan saintis terkemuka dunia bagi memberi nasihat dan kepakaran kepada badan-badan antarabangsa yang ditugaskan untuk me-nangani isu-isu tersebut. Malaysia, melalui perwakilan daripada felo-felo Akademi Sains Malaysia, akan terus mengambil bahagian secara aktif dalam IAC dan memberi sumbangan ilmu dan kepakaran serta menangani isu-isu yang dapat memberi manfaat kepada negara dan dunia amnya.

Netherlands Academy of Arts and Sciences in Amsterdam from 31 January - 2 February, 2005. Academician Datuk Dr Salleh Mohd Nor FASc and Academician Dato' Ir Lee Yee Cheong FASc attended the meeting as incoming Board Member and outgoing Board Member respectively. The Academy of Sciences Malaysia is a member of the Inter Academy Council. Apart from representatives from member academies, the meeting was also attended by special invitees from Inter Academy Medical Panel and UN Millennium Goals project. The meeting was chaired by the IAC co-chairs, Bruce Alberts, President of National Academy of Sciences, USA and Goverdhan Mehta, former President of Indian National Science Academy.

Besides providing expert knowledge and advice to international bodies, IAC also has been complementing other scientific organisations such as World Bank and United Nations (UN) in an advisory role. Among other issues discussed during the meeting include future strategy of IAC, S&T capacity building, indicators of S&T, involvement of NGOs in the S&T community, involvement of women in S&T, natural disasters and other related global issues. The highlight of the meeting was on the on-going and new IAC studies on topics such as sustainable energy systems, rebuilding universities, natural disasters mitigation, global health issues, and water issues. Through these studies, IAC will be able to fulfill its role to mobilise the world's best scientists for providing expert knowledge and advice to international bodies charged with addressing the issues. Malaysia, through the representation of the Academy of Sciences Malaysia fellows will continue to play an active role in IAC and through this we can contribute our knowledge and expertise as well as address issues that will benefit the country and the globe as a whole.

PERHIMPUNAN AGUNG PERTAMA BAGI *NETWORK OF ACADEMIES OF SCIENCES IN ISLAMIC COUNTRIES* (NASIC)

Pada April 2005, *Academician* Datuk Dr. Salleh Mohd. Noor FASc, Naib Presiden Akademi Sains Malaysia telah menghadiri Perhimpunan Agung Pertama NASIC di Islamabad, Pakistan. Ahli-ahli NASIC terdiri daripada akademi negara-negara Islam serata dunia termasuk ahli dari Itali dan Amerika Syarikat. Buat masa ini, Pakistan adalah memegang kerusi presiden dan sekretariat NASIC. NASIC telah menawarkan negara-negara ahli untuk membangunkan program perpustakaan digital dan juga memperkenalkan '*Open Access Archived*' untuk penerbitan saintifik. Selain daripada usaha ini, NASIC juga telah memulakan beberapa projek seperti Harta Intelek, Bencana Alam dan Pendidikan Sains. NASIC juga telah mengambil langkah proaktif dengan melaksanakan projek usahama dengan COMSTECH, TWAS, IAS dan lain-lain. Malaysia melalui Akademi Sains Malaysia juga telah bersetuju untuk memainkan peranan utama dalam keusahawanan atau inovasi dengan memberi garis panduan kepada penubuhan *venture-capital* menggunakan model negara.

BENGKEL *'REGIONAL ACADEMIES NETWORKING AND MECHANISM OF DISASTER MITIGATION AFTER THE TSUNAMI'*

Bengkel *"Regional Academies Networking and Mechanism of Disaster Mitigation After the Tsunami"* telah diadakan pada 19-20 Februari 2005 di Beijing, China. Bengkel dianjurkan oleh Akademi Sains China (CAS) dan dihadiri oleh ahli-ahli dari 11 Akademi Sains dari Bangladesh, Indonesia, Korea, Malaysia, Sri Lanka, Thailand, Pakistan, Turki dan Rusia. Tiga rangkaian akademi

FIRST GENERAL ASSEMBLY NETWORK OF ACADEMIES OF SCIENCES IN ISLAMIC COUNTRIES (NASIC)

In April 2005, Academician Datuk Dr Salleh Mohd Nor FASc, the Vice President of the Academy of Sciences Malaysia attended the First General Assembly of NASIC in Islamabad, Pakistan. Members of NASIC are from academies of Islamic nations around the globe including members from Italy and USA. At present, Pakistan holds the NASIC presidential and secretariat posts. NASIC has offered member countries assistance in establishing a digital library programme and also introduced "Open Access Archived" for scientific publications. Besides these efforts, NASIC has also initiated several projects namely in Intellectual Property, Natural Disasters and Science Education. NASIC also has taken a proactive step by undertaking collaborative projects with COMSTECH, TWAS, and IAS etc. Malaysia through the Academy of Sciences Malaysia also has agreed to play a leading role in Entrepreneurship/Innovation by providing guidelines for venture-capital creation using our local model.

WORKSHOP ON REGIONAL ACADEMIES NETWORKING AND MECHANISM OF DISASTER MITIGATION AFTER THE TSUNAMI

The Workshop on "Regional Academies Networking and Mechanism of Disaster Mitigation after the Tsunami" was held on 19-20 February, 2005 in Beijing, China. The workshop was organised by the Chinese Academy of Sciences (CAS) and attended by members of 11 Academies of Sciences from Bangladesh, Indonesia, Korea, Malaysia, Sri Lanka, Thailand, Pakistan, Turkey

Asia iaitu AASA, FASAS dan NASIC juga menghadiri bengkel tersebut. Akademi Sains Malaysia diwakili oleh Prof. Ibrahim Komoo FASc. Prof. Tjia Hong Djin dari Universiti Kebangsaan Malaysia turut hadir.

and Russia. The three regional academy networks in Asia, namely AASA, FASAS and NASIC were also represented at the workshop. The Academy of Sciences Malaysia was represented by Prof. Ibrahim Komoo FASc. Prof. Tjia Hong Djin from Universiti Kebangsaan Malaysia also attended the workshop.

Sebanyak 21 kertas kerja dibentangkan semasa bengkel yang merangkumi aspek saintifik yang luas seperti meliputi pengawasan, ramalan, amaran dan pengurusan bencana, pancaindera jauh dan teknologi GIS, serta pengawalan penyakit semasa bencana alam. Pengalaman dan pengajaran dari negara yang pernah dilanda tsunami dikongsi bersama dan mekanisma kerjasama serantau yang baru telah dicadangkan.

During the workshop, 21 presentations covering a wide range of scientific aspects including monitoring, forecasting, warning and disaster management, remote sensing & GIS technology and disaster disease control were made. Experience and lessons from the tsunami-affected countries were shared and a new mechanism of regional cooperation was proposed.

Bengkel tersebut telah bersetuju untuk mencadangkan satu program atau inisiatif baru mengenai mekanisma mitigasi bencana alam serantau di bawah garis panduan *InterAcademy Panel* (IAP). Akademi-akademi dan rangkaian kerjanya akan mengambil bahagian dalam usaha yang dilaksanakan oleh organisasi kebangsaan dan antarabangsa lain seperti Pertubuhan Bangsa-Bangsa Bersatu, *World Meteorology Organisations (WMO), International Oceanic Committee (IOC), Asian Disaster Preparedness Centre (ADPC), Asia Seismology Commission (ASC) dan Global Network for Tsunami Mitigation* yang baru ditubuhkan dalam memberi sumbangan unik daripada komuniti saintifik. Akademi dan rangkaian kerjanya bersama pihak media akan memberi tumpuan kepada pendidikan masyarakat bagi meningkatkan kesedaran awam mengenai bencana alam.

The workshop agreed to propose a new programme or initiative on regional disaster mitigation mechanism under the guidelines of the Inter Academy Panel (IAP). The Academies and Academy networks shall join the efforts of other national and international organisations, such as UN, World Meteorology Organisations (WMO), International Oceanic Committee (IOC), Asian Disaster Preparedness Centre (ADPC), Asia Seismology Commission (ASC) and the newly established Global Network for Tsunami Mitigation in ensuring a unique contribution from the scientific community. The Academies and Academy networks shall emphasise the education of the population to increase public awareness of natural disasters through joint efforts with the mass media.

PROGRAM AIR IAP

Akademi Sains Malaysia bersama 41 Akademi Sains dari seluruh dunia mengikuti Program Air *InterAcademy Panel* (IAP) pada September 2004. Program di bawah IAP ini diterajui oleh *Brazillian Academy of Sciences*. Program global ini

IAP WATER PROGRAMME

The Academy of Sciences Malaysia joined the other 41 Academies of Sciences worldwide in an Inter Academy Panel (IAP) Water Programme in September, 2004. The programme under the umbrella of the IAP was led by the Brazilian

memberi tumpuan kepada penyelidikan permukaan '*coupling*' dan air bawah tanah sebagai satu langkah penting ke arah pengurusan sumber air yang lebih baik. Program Air IAP mencadangkan untuk memperbaiki konservasi air, rawatan kumbahan, pengawalan eutrofikasi dan pencemaran serta menghasilkan keupayaan saintifik dan teknikal antarabangsa yang kukuh.

Academy of Sciences. The global programme focused on coupling surface and ground water research as an essential step towards better management of water resources. The IAP Water Programme proposed to improve water conservation, wastewater treatment, control of eutrophication and contamination, and to develop a strong international scientific and technical capability.

Setelah kemasukan Akademi ke dalam Program Air IAP serta menerajui penglibatan Malaysia dalam program tersebut, Akademi telah menubuhkan satu kumpulan kerja mengenai air yang dianggotai oleh pakar-pakar mengenai air dan bidang berkaitan. Kumpulan kerja yang dipengerusikan oleh Tan Sri Shahrizaila Abdullah FASc akan menerajui penglibatan Malaysia dalam program air. Ahli kumpulan kerja lain terdiri daripada Felo Akademi dan wakil daripada NAHRIM dan Jabatan Geologi dan Mineral. Kumpulan tersebut bersetuju pada awalnya, tema eutrofikasi tasik dimulakan. Seterusnya, NAHRIM telah mentauliahkan UTM untuk mengendalikan Penyelidikan Eutrofikasi T asik di Malaysia. Laporan kini dalam peringkat draf terakhir dan sebagai input Malaysia kepada program air IAP.

Following the inclusion of the Academy in the IAP water programme and to oversee Malaysian involvement in the programme, the Academy has formed a working group on water comprising experts on water and its related areas. The Working Group which is chaired by Tan Sri Shahrizaila Abdullah FASc is to oversee Malaysian involvement in the water programme. Other members of the group are Fellows of the Academy and representatives from NAHRIM and the Geology and Mineral Department. The group agreed on a common theme focusing on the initiation of eutrophication of lakes. Following this, NAHRIM commissioned UTM to undertake a desk study on the eutrophication of lakes in Malaysia. The report is now at its final draft stage and serves as Malaysian's input to the IAP Water Programme.

Ahli-ahli dari Akademi yang terlibat dalam Program Air IAP telah berjumpa buat pertama kali semasa mesyuarat persediaan "*Regional Workshops of the IAP Water Programme*" yang diadakan di Trieste, Italy pada 28-29 Mei 2005. Akademi Sains Malaysia diwakili oleh Tan Sri Shahrizaila Abdullah FASc. Antara perkara yang dibincangkan adalah cadangan penubuhan International Training Centres (ITC) sebagai pusat untuk latihan, pembangunan teknologi baru, dan kemudahan untuk menjalankan kajian mengenai air. Mesyuarat juga membincangkan enam bengkel serantau yang akan diadakan pada masa terdekat iaitu di Afrika, Amerika, Eropah, Asia Timur dan Pasifik, Timur Tengah dan Asia Selatan serta Asia Tengah.

Member Academies of the IAP Water Programme met for the first time during the Preparatory meeting for the Regional Workshops of the IAP Water Programme held in Trieste, Italy on 28-29 May, 2005. The Academy of Sciences Malaysia was represented by Tan Sri Shahrizaila Abdullah. Among others, the meeting discussed the proposed International Training Centres (ITC) which will act as centre for training, development of new technologies and field facilities for case studies of water. The meeting also discussed the six regional workshops that shall be held in the near future: Africa, Americas, Europe, East Asia & Pacific, Middle East & South Asia, and Central Asia.

LAWATAN KE ACADEMIA SINICA, TAIWAN

Delegasi tujuh pegawai yang diketuai oleh Dato' Suriah Abdul Rahman, Ketua Setiausaha MOSTI, melawat Taiwan untuk mengetahui perkembangan terkini sains, kejuruteraan dan teknologi dan juga untuk mengeratkan hubungan antara kedua-dua negara. Ahli delegasi termasuklah dari Akademi Sains Malaysia iaitu Presiden, Tan Sri Datuk Dr. Ahmad Zaharudin, Pengarah Eksekutif, Dato' Dr. Samsudin Tugiman dan Pegawai Sains Kanan, Encik Nasaruddin Rahman.

Objektif lawatan ialah untuk meneroka perkembangan terkini dan sebarang peluang dalam bidang S&T yang akan menjadi asas kepada peluang perniagaan baru, usahasama, dan kerjasama S&T antara Malaysia dan Taiwan. Fokus lawatan adalah untuk membuat kajian penubuhan beberapa institut penyelidikan di bawah *Academia Sinica* yang telah menunjukkan kemajuan yang ketara, mengadakan perbincangan dengan industri bioteknologi kecil dan sederhana Taiwan yang ingin bekerjasama dengan syarikat Malaysia, melawat *Hsinchu Science Park* untuk mempelajari pengalaman mereka mengenai pengurusan taman sains serta membuat cadangan yang sesuai mengenai hubungan kerjasama di antara Malaysia dan Taiwan.

Delegasi melawat sembilan organisasi/institut *Academia Sinica*. Antaranya ialah *Institute of Physics, Institute of Chemistry, Institute of Biomedical Sciences, Insttute of Molecular Biology, Institute of Bio-Agriculture Sciences dan Genomics Research Centre*. Delegasi juga melawat *National Tsing Hua University* dan *Hsinchu Science Park*. Delegasi melawat ketua/wakil industri bioteknologi kecil dan sederhana semasa mesyuarat bersama ahli Taiwan SMI industri bioteknologi.

Keseluruhannya, lawatan adalah amat menggalakkan dan delegasi mempelajari

VISIT TO ACADEMIA SINICA, TAIWAN

A delegation of seven officials led by Dato' Suriah Abdul Rahman, the Secretary General of MOSTI visited Taiwan to learn new developments in science, engineering and technology and to strengthen linkages between the two countries. Members of the delegation included those from the Academy of Sciences Malaysia namely the President, Tan Sri Datuk Dr. Ahmad Zaharudin, Executive Director, Dato' Dr. Samsudin Tugiman and Mr. Nasaruddin Rahman, Senior Scientific Officer.

The objective of the visit was to explore new developments and opportunities in the areas of S&T that would form the basis of new business opportunities, joint ventures and S&T cooperation between Malaysia and Taiwan. Specifically the focus of the visit was to study the setting up of various research institutes under the Academia Sinica that had shown significant progress, have discussions with small and medium biotechnological enterprises in Taiwan that would like to have linkages with Malaysian companies, visit Hsinchu Science Park to learn from their experience on the management of the science park and to make appropriate recommendations on possible collaboration between Malaysia and Taiwan.

The delegates visited nine organisations/ institutes in the Academia Sinica. These included Institute of Physics, Institute of Chemistry, Institute of Biomedical Sciences, Institute of Molecular Biology, Institute of Bio-Agriculture Sciences, Genomics Research Centre. Delegates also visited National Tsing Hua University, and Hsinchu Science Park. The delegation also met with small and medium biotechnological enterprise captains/ representatives during a meeting with members of Taiwan SMI biotech enterprises.

Overall, the visit was very fruitful and the delegation learned how Taiwan embarked on

bagaimana Taiwan mengusaha dan melanjutkan penyelidikan dalam sains asas merangkumi matematik, fizik, kimia, pfisiologi atau perubatan serta jurusan lain melalui *Academia Sinica*.

Kumpulan lawatan sebulat suara bersetuju bahawa *Academia Sinica* sebagai model untuk dicontohi dari segi cadangan penubuhan institut penyelidikan atau pusat penyelidikan yang diuruskan di bawah Akademi. *Academia Sinica* juga menawarkan warganegara Malaysia untuk mengikuti *Fellowship* di bawah *Taiwan International Graduate Programme* (TIGP) bagi menjalankan penyelidikan pascasiswazah di *Academia Sinica* atau institusi lain di Taiwan dalam bidang Biologi Kimia dan Biofizik Molekul, Dinamik Molekul dan Spektroskopi, Bioinformatik, Sains Pertanian Biologi dan Molekul, Biologi Molekul dan Sel serta Sains dan Teknologi Nano.

MESYUARAT PERTAMA PASUKAN BERTINDAK OIC UNTUK *VISION* 1441

Hasil daripada penerimaan "*Kuala Lumpur Declaration on Science and Technology for the Socio-Economic Well Being of the Ummah*" yang ke-10 dikenali sebagai '*Vision 1441*', di OIC Summit pada Oktober 2003 yang telah mempertanggungjawabkan Setiausaha Agung OIC untuk mengambil langkah-langkah perlu bagi melaksanakan resolusi yang terkandung dalam Deklarasi, satu pasukan bertindak bagi '*Vision 1441*' telah ditubuhkan oleh Sekretariat Am OIC. Mesyuarat pertama pasukan bertindak ini diadakan di Kuala Lumpur yang dianjurkan bersama oleh Kementerian Sains, Teknologi dan Inovasi serta Akademi Sains Malaysia sebagai sekretariat bersama Pasukan Bertindak ini.

Mesyuarat diadakan dari 23-25 Mac 2005 sejajar dengan "*Malaysia-IAS Science Conference*". Ahli Pasukan Bertindak yang menghadiri mesyuarat tersebut terdiri daripada Sekretariat Am OIC, COMSTECH, *Islamic Development Bank, Islamic*

and pursued research in basic sciences encompassing mathematics, physics, chemistry and physiology or medicine and other areas through the Academia Sinica.

The visit group concluded that the Academia Sinica would be an appropriate model for the Academy to adopt in terms of the proposed establishment of research institutes or research centres under the Academy. The Academia Sinica also offered Malaysians to take up fellowships for Malaysians under the Taiwan International Graduate Programme (TIGP) to carry out post-graduate research in the Academia Sinica or other institutions in Taiwan in areas such as Chemical Biology and Molecular Biophysics, Molecular Dynamics & Spectroscopy, Bioinformatics, Molecular & Biological Agricultural Sciences, Molecular & Cell Biology, and Nano Science & Technology.

FIRST MEETING OF THE OIC TASK FORCE FOR VISION 1441

Following the adoption of the Kuala Lumpur Declaration on Science and Technology for the Socio-Economic Well-Being of the Ummah known as Vision 1441, at the 10th OIC Summit in October, 2003 that tasked the OIC Secretary General to take necessary actions for the implementation of the resolutions contained in the Declaration, an OIC Task Force for Vision 1441 was subsequently established by the OIC General Secretariat. The inaugural meeting of the task force was held in Kuala Lumpur hosted by the Ministry of Science, Technology and Innovation and the Academy of Sciences Malaysia as the joint secretariat of the task force.

The meeting was held from 23-25 March, 2005 inconjunction with the Malaysia-IAS Science Conference. Members of the Task Force who attended the meeting included those from OIC General Secretariat, COMSTECH, Islamic

Academy of Sciences, ISESCO dan Malaysia sebagai Pengerusi OIC. Mesyuarat dipengerusikan oleh Ketua Setiausaha MOSTI, Dato' Suriah Abdul Rahman. Semasa pembukaan mesyuarat, ucapan daripada Setiausaha Agung OIC dibaca oleh wakilnya. Selain daripada menyuarakan penghargaan beliau kepada Kerajaan Malaysia kerana menganjurkan mesyuarat, beliau mengingati pasukan bertindak mengenai tugas yang dipertanggungjawabkan oleh OIC Summit 2003 untuk mengkaji cara dan bagaimana meningkatkan kerjasama di antara ahli OIC untuk mengadakan program dan menghasilkan cadangan yang bertujuan meningkatkan kapasiti negara-negara OIC dalam bidang sains dan teknologi.

Development Bank, Islamic Academy of Sciences, ISESCO, and Malaysia as the Chair of OIC. The Meeting was chaired by the Secretary General of MOSTI, Dato' Suriah Abdul Rahman. At the opening of the meeting, a statement from OIC Secretary General was read by his representative. Apart from expressing his gratitude and appreciation to the Government of Malaysia for hosting the meeting, he reminded the task force on its assignments as the OIC Summit held in 2003 had entrusted this task force to explore ways and means to enhance cooperation among the OIC members to conceive programmes and formulate proposals aimed at increasing the Islamic States' capacity in the field of science and technology.

Mesyuarat telah menghasilkan terma rujukan bagi pasukan bertindak yang meliputi tugas dan fungsinya, keahlian, badan pentadbiran, sekretariat, pembiayaan mesyuarat pasukan

The meeting has came out with the terms of reference for the task force covering its role and functions, membership, governing body, secretariat, funding of the task force meetings,



Dato' Seri Abdullah Ahmad Badawi semasa 'showcase' produk untuk hari esok.
Dato' Seri Abdullah Ahmad Badawi at the Showcase on Products for Tomorrow.

bertindak dan bilangan mesyuarat. Pasukan bertindak juga memberi beberapa cadangan. Ini termasuk semua *stakeholder 'Vision 1441'* patut berganding bahu untuk mengembalikan komitmen ilmiah Islam antara ummah dan memastikan sains dan teknologi dijunjung oleh kepercayaan agama.

Mereka juga mencadangkan semua Negara ahli dan organisasi dalam OIC berfungsi untuk memasukkan '*Vision 1441'* ke dalam agenda masing-masing sebagaimana ia diterimapakai di OIC Summit ke-10 pada Oktober 2003. Lanjutan itu, *'Vision 1441'* perlu dilaksanakan di peringkat kebangsaan dan serantau, juga di peringkat yang relevan dalam OIC. Mesyuarat juga bersetuju badan-badan OIC iaitu Sekretariat OIC, wakil daripada Pengerusi OIC Summit, wakil ICFM, IDB, COMSTECH, ISESCO, IAS dan ICCI dilantik sebagai ahli badan pentadbirannya. Mesyuarat juga bersetuju pasukan bertindak mengadakan perjumpaan sekurang-kurangnya dua kali setahun dan mesyuarat seterusnya dijadualkan pada November 2005 di Islamabad. Laporan mesyuarat diterima pada penghujung tiga hari mesyuarat dan diserahkan kepada Menteri Hal Ehwal Antarabangsa, Malaysia, Datuk Seri Syed Hamid Albar yang kemudiannya menyerahkan laporan tersebut kepada Mesyuarat "*Islamic Conference of Foreign Ministers*" pada Jun 2005 di Yemen.

and frequency of meetings. The task force also made several recommendations. These included that all stakeholders of Vision 1441 should join hands to rekindle the Islamic spiritual commitment of knowledge among the Ummah and ensure that science and technology is firmly faith-anchored.

They also recommended all member states and functional organs of the OIC to incorporate in their own agenda Vision 1441 as was adopted at the 10th OIC Summit in October, 2003. As a consequence, Vision 1441 needs to be implemented at the national and regional levels, as well as at relevant levels within the OIC. The meeting agreed that the following existing bodies of OIC namely OIC Secretariat, Representative of OIC Summit Chairman, Representative of ICFM, IDB, COMSTECH, ISESCO, IAS and ICCI be appointed as members of its governing body. The Meeting also agreed that the task force shall meet at least twice a year and the next meeting of the task force has been scheduled for November, 2005 in Islamabad. The report of the meeting was adopted at the end of the three-day meeting and was handed over to the Minister of Foreign Affairs, Malaysia, Datuk Seri Syed Hamid Albar. The Ministry of Foreign Affairs, Malaysia then submitted the report to the Islamic Conference of Foreign Ministers Meeting held in June, 2005 in Yemen.

INTERNATIONAL COUNCIL FOR SCIENCE (ICSU)

Akademi Sains Malaysia menjadi hos kepada Mesyuarat Serantau Pertama ICSU bagi Asia dan Pasifik di Kuala Lumpur dari 25-27 April 2005. Mesyuarat diadakan sebagai sebahagian daripada proses untuk menubuhkan Pejabat Serantau ICSU di rantau Asia Pasifik. Mesyuarat dihadiri oleh 41 peserta yang mewakili ICSU National Members, ICSU *Scientific Unions*, *Interdisciplinary Bodies* dan ICSU Key Partners. Akademi diwakili oleh Naib Presidennya

INTERNATIONAL COUNCIL FOR SCIENCE (ICSU)

The Academy of Sciences Malaysia hosted the First ICSU Regional Meeting for Asia and the Pacific in Kuala Lumpur from 25-27 April, 2005. The meeting was organised as part of the process for the establishment of ICSU Regional Office in the Asia Pacific region. The meeting was attended by 41 participants who represented ICSU National Members, ICSU Scientific Unions, Interdisciplinary Bodies and ICSU Key Partners. The Academy was represented by Academician Datuk Dr. Salleh

Academician Datuk Dr. Salleh Mohd. Nor FASc, Setiausaha Agung Datuk Dr. Mazlan Othman FASc, dan Pengarah Eksekutif Dato' Samsudin Tugiman. Mesyuarat dirasmikan oleh Yang Berhormat Menteri Sains, Teknologi dan Inovasi Malaysia, YB Dato' Sri Dr. Jamaludin Jarjis. Perkara mustahak yang dibincangkan termasuk keutamaan awal Pejabat Serantau ICSU di rantau Asia Pasifik.

Mohd Nor, the Vice President, Prof. Datuk Dr. Mazlan Othman, Secretary General and Dato' Dr. Samsudin Tugiman, Executive Director. The Meeting was officially opened by the Honourable Minister of Science, Technology and Innovation, Malaysia, YB Dato' Sri Dr. Jamaludin Jarjis. The important items discussed during the meeting included the initial priorities for ICSU Regional Office in the Asia Pacific Region.

Perhimpunan Agung ICSU yang ke- 28 telah diadakan di Suzhou, China pada 18-22 Oktober 2005. Perhimpunan Agung dihadiri oleh kira-kira 221 peserta daripada ICSU *National Members, Scientific Unions, Interdisciplinary Bodies and Associates*. Akademi Sains Malaysia diwakili oleh Prof. Muhamad Awang FASc yang juga ahli ICSU *Regional Committee for Asia and Pacific* dan Encik Nasaruddin Rahman, Pegawai Sains Kanan.

The 28th ICSU General Assembly (GA) was held in Suzhou, China from 18-22 October, 2005. The GA was attended by about 221 participants from ICSU National Members, Scientific Unions, Interdisciplinary Bodies and Associates. The Academy of Sciences Malaysia was represented by Prof. Muhamad Awang FASc who is also a member of ICSU Regional Committee for Asia and Pacific and Mr. Nasaruddin Rahman, the Senior Scientific Officer.

Acara-acara yang lain yang diadakan sejajar dengan Perhimpunan Agung adalah Forum Saintifik gabungan ICSU dan *Chinese Association for Science and Technology* (CAST) serta Forum ICSU *National Members' Forum and Unions' Members*. Perwakilan daripada Akademi juga mengadakan perbincangan berasingan dengan Pengarah Eksekutif ICSU dan Pengerusi *Regional Committee for Asia and the Pacific* mengenai perkembangan Pejabat Serantau ICSU di Kuala Lumpur. Mesyuarat tidak formal bersama beberapa ahli ICSU *Regional Committee for Asia and the Pacific* juga telah diadakan semasa perhimpunan tersebut.

Other associated events held in-conjunction with the GA were the joint ICSU and Chinese Association for Science and Technology (CAST) Scientific Forum and the ICSU National Members' Forum and Unions Members' Forum. Representatives from the Academy also had separate discussions with the Executive Director of ICSU and the Chair of the Regional Committee for Asia and the Pacific on the development of ICSU Regional Office in Kuala Lumpur. An informal meeting with a few members of the ICSU Regional Committee for Asia and the Pacific was also held during the GA.

Perhimpunan Agung ke-28 ICSU membincangkan beberapa agenda antaranya "*Developing a Strategy for ICSU*", "*International Polar Year*", "*Environment and its Relation to Sustainable Development*", "*Natural and Human-induced Hazards*", "*Science for Sustainable Development*", "*The Millenium Ecosystem Assessment*", "*Science and Society: Rights and Responsibilities*", "*ICSU Strategic Plan 2006-2011*", "*The Regional Dimension: Reports from the Regional Office*" dan "*Revision of Statutes*". Kehadiran di Perhimpunan

The ICSU 28th GA discussed several agenda items which among others included 'Developing a Strategy for ICSU', 'International Polar Year', 'Environment and its Relation to Sustainable Development', 'Natural and Human-Induced Hazards', 'Science for Sustainable Development', 'The Millennium Ecosystem Assessment', 'Science and Society: Rights and Responsibilities, the ICSU Strategic Plan 2006-2011', 'The Regional Dimension: Reports from the Regional Office', and 'Revision of Statutes'. Attendance at the ICSU GA

Agung ICSU memberi peluang kepada Akademi untuk memperolehi maklumat secara terus tentang sejauh mana perlaksanaan dan skop program dan aktiviti ICSU. Laporan status penubuhan Pejabat Serantau ICSU di Kuala Lumpur diterangkan oleh Akademi dan diterima baik oleh ahli yang menghadiri Perhimpunan Agung. Akademi Sains Malaysia diperakui memainkan peranan yang proaktif dalam penubuhan pejabat ini.

granted the opportunity for the Academy to obtain first-hand from ICSU the extent and scope of the ICSU programmes and activities. The update given by the Academy on the status of the setting up of ICSU Regional Office in Kuala Lumpur was well received by the members attending the GA and the Academy of Sciences Malaysia was recognised for its pro-active role in the move to set up this office.

Mesyuarat Ke-18 Lembaga Eksekutif *Third World Network of Scientific Organizations (TWNSO)* dan Perasmian Pejabat Serantau ICSU bagi Afrika

Mesyuarat ini telah dihadiri oleh *Academician* Datuk Dr Salleh Mohd Noor FASc Timbalan Presiden Akademi Sains Malaysia dan En. Nasaruddin Rahman, Pegawai Sains Kanan Akademi Sains Malaysia. Sejumlah 10 Ahli Lembaga Pengarah TWNSO serta pemerhati menghadiri mesyuarat yang dikelolakan oleh *National Research Foundation of the South Africa*. Tumpuan mesyuarat adalah ke atas draf laporan kajian semula yang membincangkan struktur, objektif dan program masa depan TWNSO. Laporan yang juga mengandungi panduan dan strategi bagaimana mengukuhkan organisasi akan dibentangkan kembali di Perhimpunan Agung TWNSO yang akan diadakan pada bulan Ogos 2006. Pejabat Serantau ICSU bagi Afrika juga dilancarkan pada 1 September 2005 sebelum Mesyuarat Lembaga Eksekutif TWNSO di *National Research Foundation*, Pretoria, Afrika Selatan. Pembukaan Pejabat Serantau ICSU dirasmikan oleh Menteri Sains dan Teknologi Afrika Selatan, Yang Berhormat Menteri Mosibudi.

18th Meeting of The Executive Board Third of World Network of Scientific Organizations (TWNSO) and Launching of ICSU Regional Office for Africa

Academician Datuk Dr Salleh Mohd Noor FASc Vice President of the Academy and En. Nasaruddin Rahman, Senior Scientific Officer represented the Academy of Sciences Malaysia at the above meeting. A total of 10 TWNSO Executive Board members and observers attended the meeting which was hosted by the National Research Foundation of South Africa. The highlight of the meeting was the draft review report which discussed the structure, objectives and future programmes of TWNSO. The report which also contains guidelines and strategies on how to strengthen the organisation will again be tabled at the next TWNSO General Assembly in August 2006. ICSU Regional Office for Africa was also launched on 1 September 2005 prior to the TWNSO Executive Board Meeting at the National Research Foundation, South Africa in Pretoria. The Minister for Science and Technology, South Africa, Honourable Minister Mosibudi Mangena officiated the launching of the office.

Penerbitan ASM

ASM Publications

Akademi menerbitkan buku, monograph, prosiding, majalah sains dan laporan penyelidikan dan kajian saintifik yang dijalankan oleh Akademi. Penerbitan ini adalah amat penting bagi memenuhi peranannya sebagai pusat rujukan pengetahuan saintifik bagi masyarakat saintifik di Malaysia.

The Academy publishes books, monographs, proceedings and a science magazine as well as attempts to document and publish all research reports and studies that it undertakes, so as to fulfil its role as a repository of scientific knowledge for the scientific community.

1. Academy Sciences Malaysia, "Laporan Tahunan 2004; 2004 Annual Report".Akademi Sains Malaysia, 2005.pp. 90.

2. Academy Sciences Malaysia, "10th Anniversary: Academy of Sciences Malaysia 1995-2005",2005.pp.87.

3. ASM Newsletter. Akademi Sains Malaysia, 2005.pp. 8(Quartely)

4. Estidotmy: Era Sains, Teknologi & Innovasi, "Arts and Techonolgy" Ed 36:Vol:4,2005.pp.36

5. Estidotmy: Era Sains, Teknologi & Innovasi, "Agriculture" Ed 37:Vol:4,2005.pp.36

6. Estidotmy: Era Sains, Teknologi & Innovasi, "S&T for Indigenous Industry" Ed 38:Vol:4,2005.pp.36

7. Estidotmy: Era Sains, Teknologi & Innovasi, "Genetic Engineering" Ed 39:Vol:4,2005.pp.36

8. Estidotmy: Era Sains, Teknologi & Innovasi, "Physics" Ed 40:Vol:4,2005.pp.36

9. Estidotmy: Era Sains, Teknologi & Innovasi, "Science & Society" Ed 41:Vol:4,2005.pp.36

10. Estidotmy: Era Sains, Teknologi & Innovasi, "Aerospace" Ed 42:Vol:4,2005.pp.36

11. Estidotmy: Era Sains, Teknologi & Innovasi, "ICT" Ed 43:Vol:4,2005.pp.36

12. Estidotmy: Era Sains, Teknologi & Innovasi, "Material Science" Ed 44:Vol:4,2005.pp.36

13. Estidotmy:Era Sains, Teknologi & Innovasi, "Creativity and Innovation" Ed 45:Vol:4,2005.pp.36

14. Estidotmy:Era Sains, Teknologi & Innovasi, "Engineering and Architecture" Ed 46:Vol:4,2005.pp.36

15. Estidotmy:Era Sains, Teknologi & Innovasi, "Automotive" Ed 47:Vol:4,2005.pp.36

16. Komoo, Ibrahim, "Bencana Tsunami 26.12.04 di Malaysia:Kajian Impak Alam Sekitar,Sosio-Ekonomi dan Kesejahteraan Masyarakat".Akademi Sains Malaysia, 2005.pp.168.



Akronim
Acronyms

ADPC	*Asian Disaster Preparedness Centre*
ASC	*Asia Seismology Commission*
ASM	Akademi Sains Malaysia *Academy of Sciences Malaysia*
BAS	Tinjauan Antartik Britain *Britain Antarctic Survey*
CAS	Akademi Sains China *Chinese Academy of Sciences*
CAST	Persatuan Cina untuk Sains dan Teknologi *Chinese Association for Science and Technology*
FASAS	Persekutuan Akademi Saintifik dan Masyarakat Asean *The Federation of Asian Scientific Academies and Societies*
GIS	Sistem Maklumat Geografik *Geographic Information Systems*
IAC	Majlis Antara Akademi *Interacademy Council*
IAP	Panel Antara Akademi *Inter Academy Panel*
ICSU	Konsil Antarabangsa Sains *International Council for Science*
IFS	*International Foundation for Science*
IOC	*Intergovernmental Oceonographic Commission*
IMR	Institut Penyelidikan Perubatan *Institute for Medical Research*
IPY	Tahun Antarabangsa Polar *International Polar Year*
ISC	Kongres Sains Antarabangsa *International Science Congress*
ISEF	Pameran Antarabangsa Sains dan Kejuruteraan *Intel International Science and Engineering Fair*
ITC	Pusat Latihan Antarabangsa *International Training Centre*
JCADM	Komiti Gabungan Pengurusan Data Antartika *Joint Committee on Antarctica Data Management*
KOPRI	Institut Penyelidikan Polar Korea *Korea Polar Research Institute*
KUSTEM	Kolej Universiti Sains dan Teknologi Malaysia
NASIC	Rangkaian Akademi Sains Malaysia dalam Negara-Negara Islam *Network of Academies of Sciences in Islamic Countries*
NCSRD	Majlis Kebangsaan bagi Penyelidikan dan Pembangunan *National Council of Research and Development*
MACRES	Pusat Sensor Kawalan Jauh Malaysia Malaysia Centre for Remote Sensing
MARP	Program Penyelidikan Antartika Malaysia *Malaysian Antarctica Research Programme*
MAKNA	Majlis Kanser Nasional
MASTEC	Konvensyen Sains dan Teknologi Malaysia *Malaysian Science and Technology Convention*
MDG	Sasaran Pembangunan Millenium *Millennium Development Goals*
MNRE	Kementerian Sumber Asli dan Alam Sekitar *Ministry of Natural Resources and Environment*
MOSTI	Kementerian Sains, Teknologi dan Inovasi *Ministry of Science, Technology and Innovation*
MOU	Memorandum Persefahaman *Memorandum of Understanding*
MRSM	Maktab Rendah Sains MARA *MARA Junior Science College*
MSA	Persatuan Saintifik Malaysia *Malaysian Scientific Association*
PWTC	Pusat Dagangan Dunia Putra *Putra World Trade Centre*
R&D (P&P)	Penyelidikan dan Pembangunan *Research and Development*
SAGA	Pembiayaan Penyelidikan Saintifik Lanjutan *Scientific Advancement Research Fund*
SCAR	Komiti Saintifik dalam Penyelidikan Antartika *Scientific Committee in Antarctic Research*
SCIS	Institut Sains Komputer Swedish *Swedish Institute of Computer Science*
TIGP	Program Graduan Antarabangsa Taiwan *Taiwan International Graduate Programme*
TWNSO	Organisasi Saintifik Rangkaian Dunia Ketiga *Third World Network of Scientific Organizations*
UM	Universiti Malaya *University of Malaya*
UKM	Universiti Kebangsaan Malaysia *Universiti Kebangsaan Malaysia*
UPM	Universiti Putra Malaysia *Universiti Putra Malaysia*
UTM	Universiti Teknologi Malaysia *University Teknology of Malaysia*
UIA	Universiti Islam Antarabangsa *International Islamic University*
WMO	Organisasi Meteorologi Dunia *World Meteorology Organisation*

Penyata Kewangan
Statement of Accounts

SIJIL KETUA AUDIT NEGARA
MENGENAI PENYATA KEWANGAN
AKADEMI SAINS MALAYSIA
BAGI TAHUN BERAKHIR 31 DISEMBER 2005

Penyata kewangan Akademi Sains Malaysia bagi tahun berakhir 31 Disember 2005 telah diaudit oleh wakil saya. Pihak pengurusan bertanggungjawab terhadap penyata kewangan ini. Tanggungjawab saya adalah mengaudit dan memberi pendapat terhadap penyata kewangan tersebut.

2. Pengauditan telah dilaksanakan mengikut Akta Audit 1957 dan berpandukan piawaian pengauditan yang diluluskan. Piawaian tersebut menghendaki pengauditan dirancang dan dilaksanakan untuk mendapat kepastian yang munasabah sama ada penyata kewangan adalah bebas daripada kesilapan atau ketinggalan yang ketara. Pengauditan ini termasuk memeriksa rekod secara semak uji, menyemak bukti yang menyokong angka dan memastikan pendedahan yang mencukupi dalam penyata kewangan. Penilaian juga dibuat terhadap prinsip perakaunan yang digunakan dan penyampaian penyata kewangan secara keseluruhan.

3. Pada pendapat saya, penyata kewangan ini memberi gambaran yang benar dan saksama terhadap kedudukan kewangan Akademi Sains Malaysia pada 31 Disember 2005, hasil operasi dan aliran tunainya untuk tahun tersebut berdasarkan piawaian perakaunan yang diluluskan.

(HAMDAN BIN AHMAD)
b.p. KETUA AUDIT NEGARA
MALAYSIA

PUTRAJAYA
19 April 2006

Academy Of Sciences Malaysia

PENYATA PRESIDEN DAN BENDAHARI KEHORMAT
AKADEMI SAINS MALAYSIA

Kami, TAN SRI DATUK Dr AHMAD ZAHARUDIN BIN IDRUS FASc dan DATUK IR. DR HAJI AHMAD ZAIDEE LAIDIN FASc, yang merupakan Presiden dan Bendahari Kehormat AKADEMI SAINS MALAYSIA dan juga Ahli – Ahli Majlis, dengan ini menyatakan bahawa pada pendapat Majlis Akademi, Penyata kewangan yang dikemukakan berserta dengan nota – nota didalamnya adalah disediakan untuk merujuk pandangan yang benar dan saksama berkenaan :-

(a) Lembaran Imbangan pada 31 Disember 2005 dan Akaun Pendapatan dan Perbelanjaan untuk tahun berakhir itu dan

(b) Penyata Aliran Tunai untuk tahun berakhir pada 31 Disember 2005

(c) Penyata Perubahan Dana

(d) Nota – Nota Akaun

Bagi pihak Majlis

Tan Sri Datuk Dr Ahmad Zaharudin
Bin Idrus FASc
Presiden
Akademi Sains Malaysia

Bagi pihak Majlis

Datuk Ir. Dr. Haji
Ahmad Zaidee Laidin FASc
Bendahari Kehormat
Akademi Sains Malaysia

KUALA LUMPUR, MALAYSIA

Tarikh : 0 1 MAR 2006

902-4, Jalan Tun Ismail, 50480 Kuala Lumpur.
Tel: 03-2694 9898 Fax: 03-2694 5858
E-mail: samsudin@akademisains.gov.my

AKADEMI SAINS MALAYSIA

Academy Of Sciences Malaysia

PENGAKUAN OLEH PENGARAH EKSEKUTIF KE ATAS PENGURUSAN KEWANGAN AKADEMI SAINS MALAYSIA

Saya, **DATO' DR SAMSUDIN BIN TUGIMAN**, Pegawai Utama yang bertanggungjawab ke atas pengurusan kewangan **AKADEMI SAINS MALAYSIA**, dengan ikhlasnya mengakui bahawa penyata kewangan yang dikemukakan berserta dengan nota-nota di dalamnya, mengikut sebaik-baik pengetahuan dan kepercayaan saya, adalah betul dan saya, membuat ikrar ini dengan sebenarnya mempercayai bahawa ianya itu adalah benar dan atas kehendak-kehendak Akta Akuan Berkanun 1960.

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

.....

Pada : 01 MAR 2006

Di hadapan saya,

PESURUHJAYA SUMPAH
W 092
ROBERT LIM HOCK KEE
MALAYSIA

Lot 2.10, Ting. 2, Bangunan Angkasa Raya
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E-mail: samsudin@akademisains.gov.my

AKADEMI SAINS MALAYSIA

LEMBARAN IMBANGAN PADA 31 DISEMBER 2005

	Nota	2005 RM	2004 RM
HARTANAH, LOJI DAN PERALATAN	3	2,273,122	773,808
PELABURAN	4	3,999,178	4,199,178
ASET SEMASA			
Lain-lain Penghutang	5	1,054,842	1,399,648
Simpanan Tetap	6	5,295,596	5,640,399
Wang Tunai dan Baki di Bank	7	12,112,181	4,138,835
		18,462,619	11,178,882
LIABILITI SEMASA			
Lain-lain Pemiutang	8	852,966	908,741
		852,966	908,741
ASET SEMASA BERSIH		17,609,653	10,270,141
		23,881,953	15,243,127
DIBIAYAI OLEH:			
Kumpulan Wang:			
Kumpulan Wang Pengurusan		9,517,139	9,320,658
Kumpulan Wang Endowmen		60,000	60,000
Kumpulan Wang Pembangunan		2,386,144	1,665,165
Kumpulan Wang Projek - Projek		11,918,670	4,197,304
		23,881,953	15,243,127

AKADEMI SAINS MALAYSIA

AKAUN PENDAPATAN DAN PERBELANJAAN
BAGI TAHUN BERAKHIR 31 DISEMBER 2005

	Nota	2005 RM	2004 RM
PENDAPATAN			
Sumbangan (Geran Program)		5,381,847	4,051,964
Sumbangan (Geran Operasi)		1,400,000	1,000,000
Faedah dari deposit jangka pendek		430,918	324,141
Kutipan majlis makan malam		156,601	161,150
Sumbangan Science Excellence Award		-	81,500
Pelbagai penerimaan		265,701	311,254
Keuntungan penjualan aset		800	-
		7,635,867	5,930,009
PERBELANJAAN			
Emolumen		723,163	590,678
Perkhidmatan & bekalan		394,989	478,194
Penyelengaraan dan alat kelengkapan pejabat		136,926	31,711
Pemberian dan kenaan bayaran tetap		8,393	8,090
Perbelanjaan-perbelanjaan lain		144,340	70,603
Susut nilai harta tetap	3	302,240	114,230
Kerugian Pelaburan	4	-	1,250,822
Peruntukan rosotnilai pelaburan	4	200,000	-
Majlis makan malam		232,146	188,458
Perbelanjaan mengendalikan program sains		4,907,189	3,887,026
		7,049,386	6,619,812
(Kerugian)/Lebihan pendapatan		586,481	(689,803)

AKADEMI SAINS MALAYSIA

PENYATA ALIRAN TUNAI BAGI
TAHUN BERAKHIR 31 DISEMBER 2005

	2005 RM	2004 RM
ALIRAN TUNAI DARI AKTIVITI OPERASI		
(Kerugian)/Lebihan Pendapatan Atas Perbelanjaan	586,481	(689,803)
Pelarasan:		
Susutnilai	302,240	114,230
Peruntukan Rosotnilai Pelaburan	200,000	-
Kerugian Pelaburan	-	1,250,822
Faedah dari Deposit Jangka Pendek	(430,918)	(324,141)
(Kerugian)/kelebihan pendapatan dari operasi sebelum perubahan modal kerja	657,803	351,108
(Lebihan)/kurangan Penghutang	344,806	(904,750)
Lebihan/(kurangan) Pemiutang	(55,775)	(592,884)
Tunai bersih (ke)/dari Aktiviti Operasi	**946,834**	**(1,146,526)**
ALIRAN TUNAI DARI AKTIVITI PELABURAN		
Pembelian Hartanah, Loji dan Peralatan	(1,801,554)	(4,768)
Faedah Diterima	430,918	324,141
Tunai bersih (ke)/dari Aktiviti Pelaburan	**(1,370,636)**	**319,373**
ALIRAN TUNAI DARI AKTIVITI PEMBIAYAAN		
Kumpulan Wang Endowmen	-	-
Kumpulan Wang Pembangunan	330,979	1,165,765
Kumpulan Wang Projek - Projek	7,721,366	1,104,455
Tunai bersih (ke)/dari Aktiviti Pembiayaan	**8,052,345**	**2,270,220**
PENAMBAHAN BAKI TUNAI DAN TUNAI SETARA	**7,628,543**	**1,443,067**
TUNAI DAN TUNAI SETARA PADA AWAL TAHUN KEWANGAN	**9,779,234**	**8,336,167**
TUNAI DAN TUNAI SETARA PADA AKHIR TAHUN KEWANGAN	**17,407,777**	**9,779,234**
TUNAI DAN KESETARAAN TUNAI		
Simpanan Tetap	5,295,596	5,640,399
Wang Tunai dan Baki di Bank	12,112,181	4,138,835
	17,407,777	**9,779,234**

PENYATA PERUBAHAN DANA
BAGI TAHUN BERAKHIR 31 DISEMBER 2005

AKADEMI SAINS MALAYSIA

	Kumpulan Wang Pengurusan RM	Kumpulan Wang Endowmen RM	Kumpulan Wang Pembangunan	Kumpulan Wang Projek-Projek RM	Jumlah RM
Baki pada 01 Januari 2004	10,010,461	60,000	499,400	3,092,849	13,662,710
Terimaan dalam tahun 2004	-	-	1,179,800	12,319,066	13,498,866
Lebihan perbelanjaan dalam tahun 2004	(689,803)	-	-	-	(689,803)
Perbelanjaan Bagi Tahun 2004	-	-	(14,035)	(11,214,611)	(11,228,646)
Baki pada 31 Disember 2004	9,320,658	60,000	1,665,165	4,197,304	15,243,127
Terimaan dalam tahun 2005	-	110,000	2,625,180	16,293,821	19,029,001
Lebihan pendapatan atas perbelanjaan	586,481	-	-	-	586,481
Pindahan ke Kumpulan Wang Pembangunan	(390,000)	-	-	-	(390,000)
Perbelanjaan dalam tahun 2005	-	(110,000)	(1,904,201)	(8,572,455)	(10,586,656)
Baki pada 31 Disember 2005	9,517,139	60,000	2,386,144	11,918,670	**23,881,953**

AKADEMI SAINS MALAYSIA

NOTA-NOTA KEPADA PENYATA KEWANGAN BAGI TAHUN BERAKHIR PADA 31 DISEMBER 2005

1 AKTIVITI UTAMA

Objektif utama Akademi Sains Malaysia (ASM) adalah untuk mencapai, menggalak serta meningkatkan kecemerlangan dalam bidang sains, kejuruteraan dan teknologi khusus untuk kemajuan dan pembangunan negara dan juga untuk kebaikan manusia sejagat.

2 DASAR-DASAR PERAKAUNAN

a) Asas Perakaunan

Penyata kewangan telah disediakan mengikut kelaziman kos sejarah dan mengikut piawaian perakaunan yang di luluskan.

b) Hartanah, Loji dan Peralatan dan Susut nilai

Hartanah, loji dan peralatan dinyatakan pada kos setelah ditolak susutnilai terkumpul.

Susutnilai bagi hartanah, loji dan peralatan dikira berasaskan kaedah garis lurus di atas kos di sepanjang tempoh hayat kegunaan aset-aset tersebut pada kadar yang berikut:-

Perkakas pejabat	20%
Komputer	20%
Kenderaan bermotor	20%
Pengubahsuaian	10%

Susutnilai penuh dikenakan dalam tahun pembelian bagi hartanah, loji dan peralatan. Baki bersih setiap hartanah, loji dan peralatan hendaklah tidak kurang daripada RM1.00.

c) Penjejasan Nilai Hartanah, Loji dan Peralatan

Nilai buku bersih hartanah, loji dan peralatan ASM telah di analisis pada tarikh imbangan di sediakan untuk menentukan sama ada terdapat tanda-tanda berlakunya penjejasan nilai hartanah, loji dan peralatan. Sekiranya wujud tanda-tanda kerosakan nilai hartanah, loji dan peralatan yang boleh diperolehi semula didapati kurang daripada nilai buku bersih, maka nilai buku bersih hartanah, loji dan peralatan tersebut akan diturunkan nilainya kepada nilai jumlah hartanah, loji dan peralatan yang boleh diperolehi semula.

Amaun tersebut (yang dikenali sebagai penjejasan nilai hartanah, loji dan peralatan) akan dicatatkan sebagi perbelanjaan dan direkodkan di dalam penyata pendapatan dan perbelanjaan tahun terbabit.

d) Pengiktirafan Pendapatan dan Pendapatan Tertunda

i) Pendapatan faedah

Pendapatan faedah dari simpanan dan deposit konvensional diiktiraf mengikut asas akruan.

ii) Pengiktirafan Geran/Sumbangan

Peruntukan atau Geran daripada badan-badan kerajaan dan bukan kerajaan diiktiraf berasaskan asas akruan.

Peruntukan yang diterima bagi program/projek yang merangkumi tempoh kurang daripada setahun diiktiraf sebagai hasil dalam tahun yang berkenaan. Bagi penerimaan untuk mengendalikan program/projek yang melebihi setahun, terimaan akan dimasukkan ke dalam Kumpulan Wang Projek berkenaan dan lebihan penerimaan atas perbelanjaan akan diiktiraf sebagai pendapatan bagi tahun penutupan program/projek apabila habis tempoh atau hayat program/projek tersebut. Sebaliknya jika terdapat lebihan perbelanjaan atas penerimaan ianya akan diiktiraf sebagai perbelanjaan ASM.

Geran yang diterima dari Kerajaan Malaysia untuk belanja mengurus diambilkira dalam Penyata Pendapatan dan Perbelanjaan Kumpulan Wang Pengurusan.

Bagi geran pemberian kerajaan untuk projek pembangunan ianya diiktiraf sebagai geran modal tertunda dan akan dilunaskan mengikut belanja susutnilai projek yang telah disiapkan.

e) Instrumen Kewangan

Instrumen kewangan dinyatakan dalam lembaran imbangan termasuk simpanan tetap, baki tunai dan bank, belum terima dan belum bayar. Kaedah pengiktirafan instrumen kewangan yang diterima pakai telah didedahkan dalam polisi perakaunan penyata kewangan secara berasingan.

i) Penghutang

Penghutang dinyatakan pada nilai yang dijangka boleh direalisasi. Hutang lapuk dilupuskan apabila ia dikenal pasti. Anggaran dibuat bagi hutang ragu berasaskan kajian semula semua jumlah tunggakan pada tarikh lembaran imbangan.

ii) Pemiutang

Pemiutang dinyatakan pada kos iaitu nilai saksama bayaran dan perkhidmatan yang telah diterima.

f) Peruntukan Hutang Ragu

Hutang ragu diperuntukan bagi hutang yang tidak terbayar melebihi tempoh dua tahun.

g) Tunai dan Kesetaraan Tunai

Tunai dan kesetaraan tunai merangkumi tunai ditangan, baki di bank dan simpanan tetap.

3 HARTANAH, LOJI DAN PERALATAN

	Perkakas pejabat RM	Komputer RM	Kenderaan bermotor RM	Pengubah-suaian RM	2005 RM	2004 RM
KOS						
Pada 1 Januari 2005	87,166	250,562	304,604	1,111,908	1,754,240	1,749,472
Tambahan	49,530	23,720	5,291	1,723,013	1,801,554	4,768
Pelupusan	(10,742)	-	(4,098)	-	(14,840)	-
Pada 31 Disember 2005	125,954	274,282	305,797	2,834,921	3,540,954	1,754,240
SUSUTNILAI TERKUMPUL						
Pada 1 Januari 2005	83,333	245,233	304,600	347,266	980,432	866,202
Susutnilai	10,860	6,830	1,058	283,492	302,240	114,230
Pelupusan	(10,742)	-	(4,098)	-	(14,840)	-
Pada 31 Disember 2005	83,451	252,063	301,560	630,758	1,267,832	980,432
NILAI BUKU BERSIH						
31 Disember 2005	42,503	22,219	4,237	2,204,163	2,273,122	-
31 Disember 2004	3,833	5,329	4	764,642	-	773,808
Susutnilai yang dicaj pada tahun berakhir 31 Disember 2004	953	2,086	-	111,191	-	114,230

4 PELABURAN

	2005 RM	2004 RM
Amanah Saham Prudential dan Pacific Dana Aman	4,199,178	5,450,000
Peruntukan Rosotnilai Pelaburan	200,000	-
	3,999,178	5,450,000
Kerugiaan Jualan	-	(1,250,822)
	3,999,178	4,199,178
Harga Pasaran	3,584,087	4,152,904

5 LAIN-LAIN PENGHUTANG

	2005 RM	2004 RM
Pendahuluan	80,034	39,439
Faedah Terakru	25,971	33,524
Pendapatan Terakru	922,920	1,126,631
Penghutang	25,917	220,054
	1,054,842	1,419,648
Peruntukan Hutang Ragu	-	20,000
	1,054,842	1,399,648

6 SIMPANAN TETAP

Deposit simpanan dalam institusi kewangan berlesen terdiri daripada:-

	2005 RM	2004 RM
Simpanan Tetap	2,385,596	2,380,399
Simpanan Tetap-ASM	60,000	60,000
Simpanan Tetap-Antarctica	500,000	500,000
Simpanan Tetap-Nobel Laureate	350,000	700,000
Simpanan Tetap SAGA	2,000,000	2,000,000
	5,295,596	5,640,399

7 WANG TUNAI DAN BAKI DI BANK

	2005 RM	2004 RM
Bank-Operasi ASM	1,502,185	872,027
Bank-Antarctica	13,515	13,497
Bank-Nobel Laureate/SAGA	9,055,592	306,278
Bank-NSTRC	662,696	1,697,622
MBB Antarctica	876,193	1,247,411
Tunai Runcit	2,000	2,000
	12,112,181	4,138,835

8 LAIN-LAIN PEMIUTANG

	2005 RM	2004 RM
Pemiutang Am	821,301	879,549
Peruntukan Perbelanjaan Program	25,921	21,000
Cek belum ditunaikan	700	700
Peruntukan Perkhidmatan Audit & Akaun	5,044	7,492
	852,966	908,741

9 INSTRUMEN KEWANGAN

a. Objektif dan polisi pengurusan risiko kewangan

Polisi pengurusan risiko kewangan ASM adalah untuk memastikan sumber-sumber kewangan yang mencukupi bagi pembanguan operasi ASM sementara menguruskan risiko-risiko kewangannya, termasuk risiko kredit, risiko kadar faedah, risiko pinjaman tidak berbayar, risiko kecairan dan aliran tunai.

b. Risiko kredit

Risiko kredit ASM adalah daripada akaun-akaun belum terima. Akaun-akaun ini dipantau dari masa ke masa melalui prosedur dalaman yang sedia ada dan tindakan akan diambil terhadap hutang-hutang tertunggak.

c. Risiko kadar faedah

ASM menyelenggara satu had tunai dan simpanan tetap untuk memenuhi keperluan modal kerja. Risiko ini wujud akibat kadar turun naik kadar faedah pasaran.

d. Risiko kecairan dan aliran tunai

ASM menguruskan dengan teliti urusan keluar masuk tunai dan juga urusan pengutipan semula hutang-hutang pelanggan yang mencapai tempoh matang bagi menjaga kecairan dan aliran tunainya.

10. MANFAAT KAKITANGAN ASM

a. Manfaat jangka pendek

Upah, gaji, elaun dan sumbangan keselamatan sosial diiktiraf sebagai perbelanjaan pada tahun di mana perkhidmatan yang diberikan oleh kakitangan ASM. Pampasan ketidakhadiran terkumpul jangka pendek seperti cuti tahunan berbayar diiktiraf bila perkhidmatan yang diberi oleh kakitangan ASM akan menambahkan hak pampasan ketidakhadiran akan datang dan pampasan ketidakhadiran tidak terkumpul jangka pendek seperti cuti sakit diiktiraf bila ketidakhadiran.

b. Pelan caruman wajib

Menurut peruntukan perundangan, syarikat-syarikat di Malaysia membayar caruman kepada skim pencen Negara, Kumpulan Wang Simpanan Pekerja (KWSP). Selain daripada KWSP, ASM juga mencarum kepada Kumpulan Wang Pencen Kerajaan. Caruman tersebut diiktiraf sebagai perbelanjaan dalam penyata pendapatan bila ia tertanggung.

11. MAKLUMAN KAKITANGAN

Jumlah kakitangan ASM pada 31 Disember 2005 adalah seramai 19 orang. (31.12.2004 : 10 orang)

12. ANGKA PERBANDINGAN

Angka-angka perbandingan bagi tahun lepas telah disusun semula di mana perlu supaya selaras dengan angka yang dibentangkan tahun ini.

13. PEMBERIAN KUASA UNTUK PENGISUAN

Penyata kewangan Akademi bagi tahun kewangan berakhir 31 Disember 2005 diberi kelulusan berdasarkan resolusi Majlis Akademi pada 25 Februari 2006.