EARTH to SPACE

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Universiti Kebangsaan Malaysia
The National University of Malaysia

2015 INTERNATIONAL CONFERENCE ON SPACE SCIENCE AND COMMUNICATION

Universiti Kebangsaan Malaysia
The National University of Malaysia

EARTH to SPACE

EDITORIAL TEAM

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Bismillahirrahmanirrahim

Assalammualaikum wbt

I congratulate the team members of IPI Bulletin Earth to Space for the publication of this second issue. This issue focuses more comprehensively on the results of research conducted by the researchers at the Institute of Climate Change and the research activities related to the various research projects that were carried out during the period of June to December 2015. I deeply believe that the briefly compilation of a wide range of research activities in this bulletin can reflect the image of the Climate Change Institute as a Centre of Excellence at Universiti Kebangsaan Malaysia. Last but not the least, this issue might be referred and accessed as a trusted source of scientific and technical knowledge by a wide range of audiences.

Thank you.

Prof. Dato' Dr. Sharifah Mastura Syed Abdullah
Director Institute of Climate Change (IPI)

Message from CHIEF EDITOR

Bismillahirrahmanirrahim

Assalamualaikum warahmatullahi wabarakatuh and warm greetings!

The current issue of IPI Bulletin deals exclusively with the topic of Iconspace 2015 conference. This 2nd issue of the bulletin includes all activities and programs that have been carried out from July 2015 until December 2015. Let me take this opportunity on the occasion of the bulletin to thanks all the contributors to this bulletin, the editorial team, the authors and valued readers. So, if you have any comments or suggestions about any of the content of the IPI Bulletin, please drop us a line at pghikp@ukm.edu.my. Your feedback is always most welcome.

Thank you.

Sr. Dr. Khairul Nizam Abdul Maulud
Chief Editor
Bulletin IPI

ICONSPACE 2015: SPACE TECHNOLOGY FOR HUMANITY

By:- Nurul Hajijah Hair & Mardina Abdullah

Space Science Centre (ANGKASA), Institute of Climate Change (IPI) Universiti Kebangsaan Malaysia (UKM) has successfully organized the "2015 International Conference on Space Science and Communication" (IconSpace2015) from 10th to 11th August 2015 at Langkawi Island, Kedah, Malaysia. It was the fourth biennial conference organized by ANGKASA since 2009 with increasing numbers of local and international participants. IconSpace2015 was co-organized with the Institute of Electrical and Electronics Engineers (IEEE) through IEEE Malaysia Communication Society and Vehicular Technology Society Joint Chapter (IEEE ComSoc/VT) together with IEEE Malaysia Section Geoscience and Remote Sensing Society Chapter (GRSS). This conference received tremendous support from the public institutions and industries, namely National Space Agency of Malaysia (ANGKASA), International Union of Radio Science (URSI), Altair Engineering Sdn Bhd, Rohde & Schwarz Malaysia Sdn Bhd., Sirim Measurement Technology Sdn Bhd and Uwave Sdn Bhd.

IconSpace2015 was a platform for academics, scientists, engineers and students to interact, share and disseminate information on the latest developments in space science, communication and technological advances. It aimed to address the advances of space science and communication research by bringing together researchers in the fields of space science, communication technology and related fields. It also provided researchers the opportunity to present their current research findings and the opportunity for research collaborations.

The theme of IconSpace 2015 "Space Technology for Humanity" was inspired by the catastrophic events that occurred recently in Malaysia such as the missing Malaysian Airlines flight MH 370 and the flood disaster in Kelantan. The conference was a platform for the researchers to gather and share information as well as to discuss the ways in which they can contribute to reduce or avert the risks of such events in the future for a better and safer environment.

The two-day conference covered interesting topics under five main tracks: Astrophysics and Astronomy, Atmospheric Sciences, Geosciences and Remote Sensing, Satellite and Communication Technology, Disaster Management and Space and Climate Change/Others. During the conference, a total of more than 100 conference papers were presented. Several well-known keynote speakers i.e. Prof. Dr. David Matolak from United States of America, Prof. Dr. Mengu Cho from Japan, YBhg. Datuk Dr. Mazlan Othman and Prof. Dr. Mahamod Ismail from Malaysia were invited, attracting participants from various parts of the world to take part in the conference.

IconSpace2015 was officiated by the Exco of Science, Innovation and Information Technology, Communications and High Technology and Information Resources who represented Datuk Seri Mukhriz Tun Dr. Mahathir, the then Chief Minister of Kedah. The officiation ceremony was held during the conference dinner on the first day of the conference, during which 4 international participants were selected to deliver short speeches about their country and experience in IconSpace2015.

In conjunction with the conference, a forum with the theme "Understanding the Equatorial Environment: In and from Space" was held on 11th August 2015, moderated by Prof. Dr. Mohd. Alauddin Mohd. Ali. Four experienced panelists from the local industries, government agencies and research institutions, namely Datuk Dr. Mazlan Othman (Academy of Sciences Malaysia), Dato' Dr. Ahmad Sabirin Arshad (Astronautic Technology (M) Sdn. Bhd.), Prof. Sr. Dr. Mazlan Hashim (Universiti Teknologi Malaysia) and Prof. Madya Ir. Dr. Mandeep Singh (Universiti Kebangsaan Malaysia) participated in the forum. Additionally, Prof. Dr. Babatunde Rabiu (National Space Research and Development Agency, Nigeria) also joined the forum via teleconference.

On the last night, the IconSpace2015 Committee brought together around 40 participants of the conference to a social event at Langkawi National Observatory (LNO) to enjoy stargazing and to visit the available facilities. They were also given information on the previous and current research conducted by LNO and their contributions towards the space science development in Malaysia.

IconSpace2015 ended with a tutorial on Systems Tool Kit (STK) for Space Applications on 12th August 2015. Conducted for about 15 participants, the aim of the tutorial was to demonstrate the STK software simulation in various aspects of space applications. The tutorial was designed to familiarize beginners or advance users with STK software workflow through hands-on training.

Hosting this conference required high commitment from all parties. Appreciation must be given to the committee members and the International Advisory Committee who had made possible the success of this conference. Hopefully, IconSpace2015 will become a distinguished conference that not only contributes to space science and communication research fields but also encourages and inspires more of the younger generation to venture into science and technology in the future.

Receptor Modeling for the Legislative Measures on Haze Pollution in Malaysia

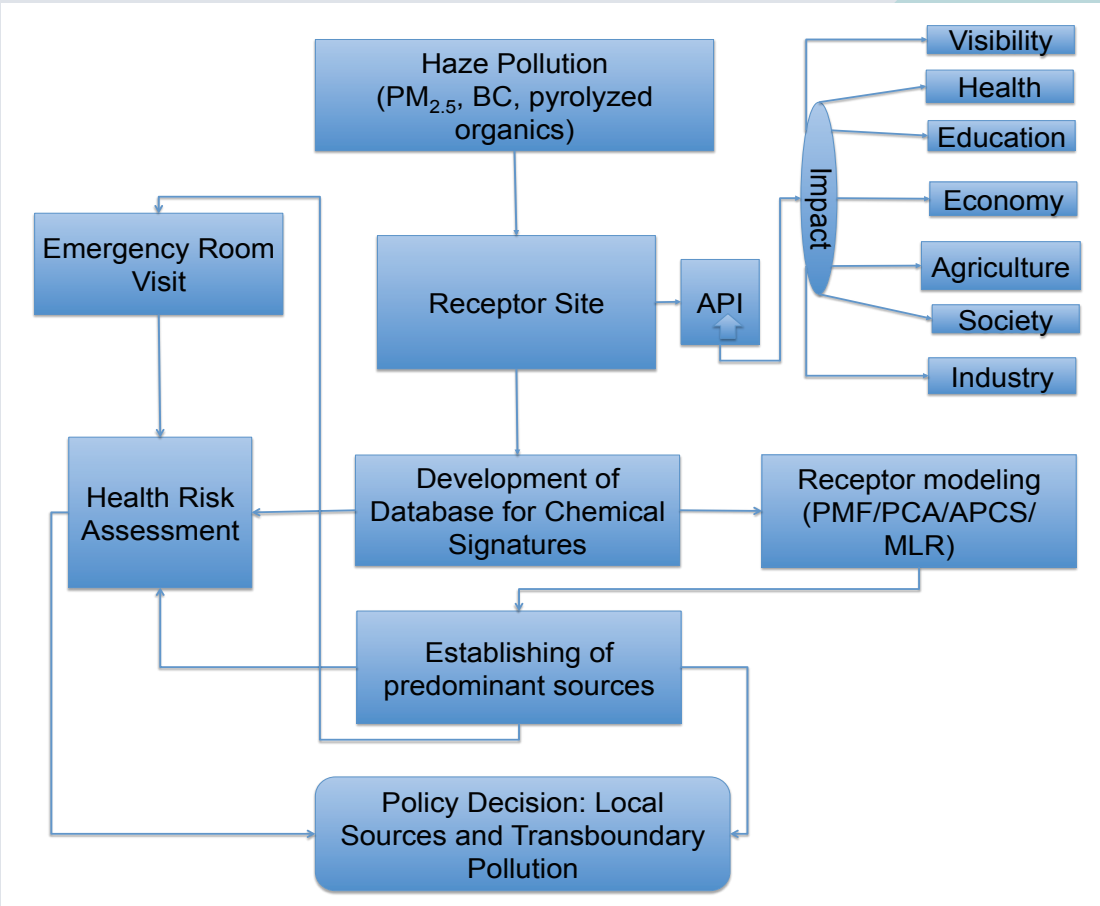
By :- Md Firoz Khan

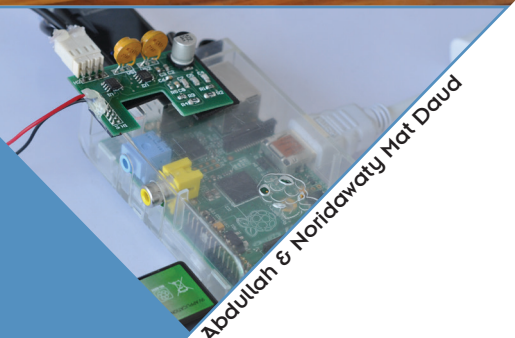
Haze pollution in the Southeast Asia is a significant regional issue which is needed further address scientifically. This brief discussion attempted to highlight the source-receptor relationship pertain in this issue. Application of receptor model at receptor region can reveal the impact from the source region. Therefore, receptor model using the database constituting the molecular markers may assist the stakeholders to adopt mitigation measures.

The appearance of dense haze is due to the visibility impairment in many parts of the world. Smog phenomenon has been marked as a burning issue around the globe with regard to the reduction of visibility. There is an evidence that smog, the combination of smoke and fog, is an effect of the photochemical reaction of some atmospheric constituents that can cause the reduction of visibility in California, Los Angeles, USA and Sidney, Australia. However, many parts of the world suffer from the smog originating that is related to the anthropogenic activities. A number of such kind of examples are documented such as the great killer smog in London 1952,hazardous smog in China, a hazy condition in New Delhi and the yearly occurrence of haze in the Southeast Asia are commonly attributed as generated from the anthropogenic activities. What does make haze issue to be highly significant in Southeast Asia?

The concentration of fine (PM2.5) and ultra-fine airborne particles, the best indicator of the level of health risks from air pollution, were abruptly high at the source as well as receptor region which falls in the unhealthy level of air pollutant index (API) during haze episode.The impact of such phenomena are: (a) impairment of visibility and environmental damage, (b) citizens, especially children and elderly suffer from acute respiratory diseases, (c) government compelled to shutdown institutions on emergency basis leading to huge economic loss (US $16 billion in 2015, Indonesia), and (d) greatly increases societal stress or risk. An explicit picture of pollution at the receptor region can link to the legislative measure at the source region. Accounting for this significant issue, a scientific expedition is of prime importance to explore the hazardous elements as well as molecular markers representing biomass burning (BB) and peat fires at the receptor points. Some of the key variables are used as proxy to reflect BB and peatland fires are primarily emitted from the BB combustion and cellulose pyrolysis product respectively. These are the core composition of fine particles.

During the transport to the receptor region, fine and ultrafine particles undergo rapid growth process due to the external or internal mixing with the pre-existing particles in the atmosphere. At large, inductively coupled plasma mass spectroscopy (ICPMS), gas chromatography mass spectrometry (GCMS) and thermal optical analysis are used for the determination of inorganic trace metals, organic molecules and elemental carbon (EC) and organic carbon (OC), respectively. As on the development of chemical signatures or tracers, the multivariate receptor models are to be proposed in the studies as a source apportionment tool. There are several models widely used for the quantitative information of the pollutant sources. The most commonly used models are- a) chemical mass balance model (CMB), b) positive matrix factorization (PMF), c) UNMIX, and d) principal component analysis coupled with absolute principal component score (PCA/APCS). Among the receptor models, the PMF uses weighted least-squares fit and estimates error of the measured data. This can impose non-negativity constraints. Health risk assessment (HRA) in integrating the response of receptor model and the number of the patient making emergency room visit which can provide the impact of the predominant sources of airborne particles at the receptor site. Now it is an interrogation that does it lead us to an easy step working on the haze pollution?





SID Space Weather Monitoring program is an education project aimed at building and distributing inexpensive ionospheric monitors to students around the world. The program was introduced by Stanford SOLAR Centre of Stanford University. The monitors are used to detect the changes in the earth's ionospheric layer caused by solar flares and other ionospheric disturbances that might affect very low frequency (VLF) radio propagation.

THE UKM-SID SPACE WEATHER MONITORING PROGRAM

By: Mardina Abdullah & Noridawaty Mat Daud

Earth's ionosphere reacts strongly to the intense X-ray and ultraviolet radiation released by the Sun during a solar flare. By using a receiver to monitor the signal strength from distant VLF transmitters and noting unusual changes as the waves bounce off the ionosphere, these Sudden Ionospheric Disturbances (SIDs) can be directly monitored and tracked.

There are two versions of SID monitors, the original SID instrument called AWESOME, and a new instrument called lower-cost SuperSID. These two monitors were provided to UKM through Malaysia's participation in the International Space Weather Initiative (ISWI) and the collaboration between the Institute of Space Science (ANGKASA), UKM (currently known as Space Science Centre) and Stanford University, U.S. UKM researchers started the SID Introductory Project in 2012 to provide exposure and early space weather education to high school students. Through this project, the researchers have succeeded in building their own monitors known as UKM-SID.

In line with the government's vision to create space weather awareness among the public, the Space Weather Innovation Competition was organized in collaboration with the National Space Agency (ANGKASA) in 2013. The competition was designed for high school students all over Malaysia, and conducted online through a website. The competition aimed at promoting awareness and better understanding of space weather among high school students in Malaysia, in the effort to cultivate students' interest in research through the usage of the UKM-SID monitor. This project won the UKM community engagement award in 2014.

In order to make the system more robust, UKM researchers have successfully developed a new system using Raspberry Pi known as UKM-SIDπ in 2015. This innovative project is an improvement to the existing UKM-SID system which uses a desktop PC to run the program and the data collection for further analysis. While the desktop PC is bulky, expensive and difficult to move around, the Raspberry Pi is basically the opposite; it is a tiny computer the size of a credit-card, inexpensive, and mobile. Due to these features, it is a suitable candidate to replace the bulky desktop computer which is required for the SID program in order to develop a portable space weather monitoring system. The new system has also been proven to be cost effective, and it requires low power consumption. This project has been funded by Yayasan Sime Darby (Sime Darby Foundation) and has won awards in several competitions such as the Appreciation Prize in 2015 Selangor My Innovation Challenge Programme, gold medal in Hari Inovasi Fakulti Pendidikan 2015 and silver medal in the K-Novasi Competition 2016.

Through this project, students showed various positive effects and gained better understanding about the research. The objective of this project, which is to foster research aptitude among high school students, has also been achieved successfully. In the future, it is hoped that this project could provide more interesting activities in order to help the government improve students' interest in science especially in the field of space science.

SEA LEVEL RISE AND IMPACT TO THE COASTAL ZONE

The rise in sea level has become a great concern to civilisation as part of the global dilemma of climate change. The climate change has brought about many threats to the ecosystem by including natural hazards, particularly sea level rise (SLR). SLR is among the most significant yet complex and often misinterpreted aspects of climate change. SLR has serious physical impacts on coastal areas, mainly characterized by inundation risk and displacement of lowlands and wetland. Moreover, a significant increase of sea level will obstruct the economy, trade, tourism, biodiversity, and livelihood and so on.

Coastal zone are particularly vulnerable to the impacts of nature and human and are physically very unstable. Erosion and associated loss of land are the most obvious sign of this uncertainty. In most cases, erosion occurs due to natural causes but there are cases of erosion due to interference in nature by human. The increasing coastal inundation vulnerability may lead to substantial social-economic losses such as the loss of coastal structures, damage to buildings and settlements, dislocation of the population, and the loss of the agricultural production. The phenomenon of SLR is one of the effects of global warming and Malaysia is taking this issue seriously. The studies conducted by the Intergovernmental Panel on Climate Change (IPCC) estimated that sea level is rising totally at about 13 to 94 centimetres on the year 2100 as a result of the ocean thermal expansion and the melting of ice caps.

The impact of sea level as one of the major effects of climate change was the main focus of numerous studies on marine habitats and human settlements along the coast. In the Malaysian context, the national coastal erosion study conducted by the Department of Irrigation and Drainage in 1986 found that 1,300 km out 4,309 km of Malaysian coastline was eroded. For example, Batu Pahat, the southernmost point of Peninsular Malaysia and mainland Asia, continues to be threatened by the severe coastal erosion. Batu pahat is one of the districts under the governance of Johor Darul Takzim, located towards the South of Peninsular Malaysia. Thus, the continuous SLR has been affecting the shoreline changes, environment and human activities along the shoreline of Batu Pahat. The effect has evidenced by the inundated sea water in some places, such as at Kampung Lapangan Terbang, Kampung Sungai Ayam, Minyak Beku and Kampung Serting during high tide event on 8 November 2014.

By: Fazly Amri Mohd & Sr. Dr. Khairul Nizam Abdul Maulud

Climate change can directly and indirectly affect humans and their activities as well as natural systems and processes. It is envisaged that even with the most stringent implementation of measures, the impacts of climate change in the next few decades cannot be totally avoided. The government recognises that the impacts of climate change transcend all levels, sectors, stakeholders and major groups. For that reason, Malaysia adopts precautionary principles to mitigate and adapt to climate change. At the national level, Malaysia has formed a national climate committee to implement and formulate effective strategies on climate change such as Flood Zone near with coastal through collaborative participation, based

on indigenous and scientific knowledge. The strategies drawn include policies, public awareness on climate change, food supply and coastal management to mitigate the rising of sea level. This will ensure climate resilient development that fulfils national aspirations for sustainability.

2015 ANGKASA BOWLING CARNIVAL

Date: 19 April 2015
Venue: Ampang Superbowl, Bangi Gateway Shopping Mall, Bangi.
Organizer: Space Science Centre (ANGKASA)

The 2016 ANGKASA Bowling Carnival was hosted by ANGKASA as part of the recreational activities for the staffs, students and their families. More than 45 participants joined the bowling carnival. At the end, the winner of the bowling event were received a token prize from Prof. Ir. Dr. Mardina Abdullah.

3RD ANNUAL GRAND MEETING OF ANGKASA STUDENTS' ASSOCIATION (ASA)

Date: 12 June 2015
Venue: Auditorium Siswa, Pusanika, Universiti Kebangsaan Malaysia
Organizer: ANGKASA Student Association (ASA)

The 3rd Annual Grand Meeting of ASA was organized on 12 June 2015 and discussed to form a new committee for Semester I and II of 2015/2016. All students of ANGKASA were participated in the meeting and the former president of ASA addressed and introduced the annual report to the participants. A new election decided that Siti Khalijah Zainudin will lead the new ASA Committee. In the meeting, the new committee took several initiatives to be implemented in future such as ASA capacity building and sport activities.

HYDRAULIC MODELLING COURSE OF CONSTRUCTION IN COASTAL AND OFFSHORE (LEVEL 1)

Date: 5 - 7 October 2015
Venue: Bayview Hotel, Melaka
Organizer: Earth Observation Centre (EOC), Institute of Climate Change (IPI) & Environment Institute of Malaysia (EiMAS), Department of Environment (DOE)

The main objective of the workshop was to provide training to the participants in the Environmental Impact Assessment (EIA). The particular focus was given at the areas of EIA: the associated reclamation, the development of land on the coast in terms of basic knowledge of hydraulic modelling, impact prediction, control measures and Management Best Practices (BMPs). Participants were mainly representing the DOE of each state in Malaysia who are involved in the evaluation of on the EIA reports prepared by the negotiators, particularly hydraulic report.

KARNIVAL FALAK MELAKA IN CONJUNCTION WITH MAAL HIJRAH 1437H CELEBRATION

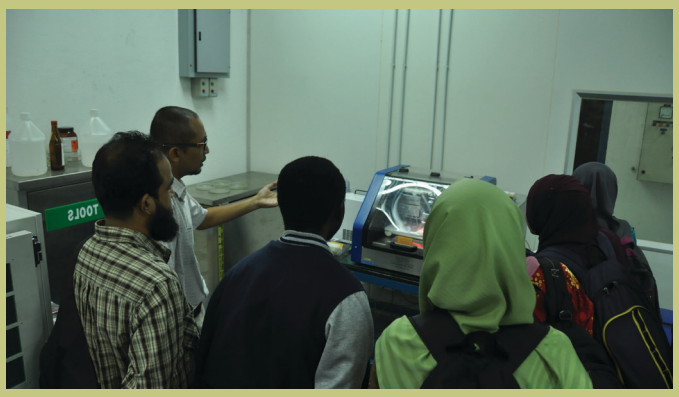
Date: 14–18 October 2015
Venue: Dataran Pusat Islam Melaka, Melaka
Organizer: Jabatan Mufti Negeri Melaka

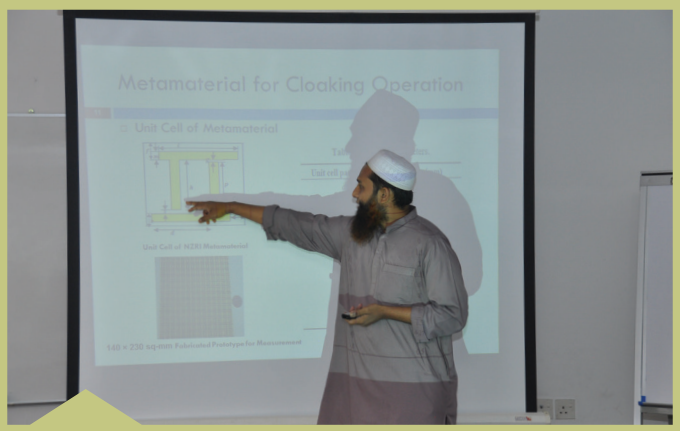
An invitation was received by ANGKASA to join the exhibition in the Karnival Falak Melaka as part of the celebration of Maal Hijrah 1437H. In the event, ANGKASA Outreach Team disseminates postgraduates programs and research initiatives to promote the visibility of ANGKASA.

SEMINAR PENYELIDIKAN SISWAZAH ANGKASA 2015 (SPSA 2015)

Date: 20 October 2015
Venue: Astronautic Technology Sdn Bhd (ATSB), Shah Alam
Organiser: Space Science Centre (ANGKASA) and ANGKASA Student Association (ASA)

The annual SPSA 2015 was hosted to present and discuss current research results related to space science, space technology and climate change by the postgraduate students from Space Science Centre (ANGKASA). More than 16 students were presented their research progress and their research outcomes were evaluated by experienced researchers. Siti Katrina Zulkeple and Sikder Sunbeam Islam were selected as best presenter, respectively, for Masters and PhD category. The best presenters received their awards from the Head of ANGKASA, YBhg. Prof.Ir. Dr. Mardina Abdullah, in a BBQ Dinner hosted at the Putrajaya International Convention Centre (PICC).





2015 SELANGOR MY INNOVATION CHALLENGE

Date: 26–29 October 2015
Venue: Foyer, SUK Office of Selangor State Government
Organizer: The Selangor State Government Administration

ANGKASA SID Research Group participated a competition "The 2015 Selangor My Innovation Challenge (Program Cabaran My Innovation Negeri Selangor Tahun 2015)". Prof. Ir. Dr. Mardina Abdullah and her research group with a project entitled 'Sistem Pemantauan Cuaca Angkasa UKM-SID" won the Appreciation Award (IPT Category) with cash prize worth RM3000.

HELICOPTER SMART CONTROL COMPETITION

Date: 7-8 November 2015
Venue: Politeknik Banting Selangor
Organizer: Space Science Centre (ANGKASA), Politeknik Banting Selangor (PBS), Department of Electric, Electrical and System Engineering (JKEES), FKAB UKM

The Helicopter Smart Control Competition 2015 was organized in cooperation with Politeknik Banting Selangor. More than 45 students participated in the program from Politeknik Banting, Politeknik Shah Alam and Malaysia Institute of Aviation Technology. The program was started with workshop and group training led by two facilitators from UKM and Politeknik Banting. On the second day, all participants were given tasks by evaluator to be presented during the competition. Three groups with highest points were selected and received awards for their achievement in handling the helicopter. Positive feedbacks were received from participants involved especially from Politeknik Banting who sponsored the event.

2015 JOURNAL PUBLICATION WORKSHOP

Date: 18 November 2015
Venue: Research Complex, UKM
Organiser: Space Science Centre (ANGKASA)

The 2015 Journal Publication Workshop was hosted by ANGKASA and attended by more than 40 postgraduate students from various departments or institutions in UKM. The workshop was started with an welcome address by the Head of ANGKASA, Prof. Ir. Dr. Mardina Abdullah followed by the talks from three invited speakers as below:

Prof. Dr. Azah Mohamed (UKM) Motivation of High Impact Journal Writing
Assoc. Prof. Dr. Mayeen Uddin Khandaker (UM) High Impact Journal Writing, Ethics and Plagiarism
Dr. Md. Eaqub Ali (UM) A Guideline to Write and Publish A Review Paper

GRANT SESSION FOR RESEARCH PROJECTS ON ENVIRONMENTAL ISSUES IN THE STRAITS OF JOHOR BY THE DEPARTMENT OF ENVIRONMENT (DOE) MINISTRY OF NATURAL RESOURCES AND ENVIRONMENT MALAYSIA

Date: 20 November 2015
Venue: Hotel Puri Pujangga
Organizer: Earth Observation Center (EOC), Institute of Climate Change (IPI)

Earth Observation Center (EOC) has received an extension of the project to be studied on the environmental issues in the Straits of Johor. The project was led by Prof. Dato: Dr. Sharifah Mastura Syed Abdullah and the total budget of the project was about RM 2,929,212.68 for a period of two years (September 2015- September 2017). Thus, the briefing of the grant was made on 20 November 2015 hosted by IPI. Dato: Halimah Hassan, Director General of DOE Malaysia and Prof. Dr. Nor Ghani Md Nor, Pro Vice-Chancellor (Generation and Infrastructure) as UKM representative were attended the briefing. The project involves the study of water quality, socio-economic, ecological and morphological for areas with the development of data depository for the project.

ANGKASA SEMINAR SERIES

Date: 25 November 2015
Venue: Conference Hall, Faculty of Science and Technology (FST), UKM
Organizer: Space Science Centre (ANGKASA) and ANGKASA Student Association (ASA)

Space Science Centre (ANGKASA) organized a Seminar Series aimed to provide a platform in knowledge transfer between researchers and various level of community. Following the success of 2009 ANGKASA Seminar Series, ANGKASA annually stages the program with various issues or theme and the participation of speakers. The theme of the seminar was selected for 2015 as "The Benefits of Current Space Weather Research and Its Future". It was anticipated that the four speakers representing the government agency, industrial and academic organization, would introduce new perspectives of knowledge in space science to the audience. This seminar series was also recognized as a platform for ANGKASA student to deliberate their research work. The seminar started with the welcoming and opening remarks from the Head of ANGKASA, Prof. Ir. Dr. Mardina Abdullah followed by the talks from three invited speakers as below:

Mr. Mhd Fairos Asillam (National Space Agency): Current Space Science Research in Malaysia
Mr. Norhizam Hamzah (Astronautic Technology Sdn. Bhd): Space Science Research in the Future and the Issue
Assoc. Prof. Dr. Mandeep Singh (UKM): Space Science Research Benefit for Community
Ms. Suhaila M. Buhari (ANGKASA UKM) Equatorial Plasma Bubble in Southeast Asian Sector

DAY CAMP: *"KEM SEHARI SKUAD PALMA EMAS"*

Date: 29 December 2015
Venue: Hutan Pendidikan Alam, Faculty of Science & Technology, UKM
Organizer: UKM-YSD Chair in Climate Change and Faculty of Science & Technology

Kem Sehari Skuad Palma Emas was held on 29 December 2015 aimed to give exposure and create awareness for children aged 9-12 about the oil palm ecosystem and its impact on human life. This awareness program is important as oil palm is the second largest industry in Malaysia and the needs in preserving the ecosystem must be nurtured among the younger generation. This program was participated by three schools around Bandar Baru Bangi namely Sek. Keb. Jalan 3, Sek. Keb. Jalan 4 and Sek. Ren. Sri Al Amin with total of 50 participants. "Buku Kepelbagaian Biologi Ekosistem Sawit" and "Buku Aktiviti Kepelbagaian Biologi Ekosistem Sawit", published by UKM and Institute of Climate Change were used for teaching and learning process. During the program, participants were guided by 13 facilitators and researchers mostly postgraduate students from the Faculty of Science & Technology UKM. The program was officiated by the CEO of Yayasan Sime Darby, Puan Hjh Yatela Zainal Abidin.

FIRST PH.D. STUDENT GRADUATED FROM INSTITUTE OF CLIMATE CHANGE

Institute of Climate Change (IPI) successfully produced the first batch of Doctor of Philosophy from its Space Science Centre. Dr. Radial Anwar was honored with a Doctoral Degree in the 43rd Convocation Ceremony, 1 - 4 November 2015 at DECTAR UKM.

Dr. Radial Anwar has conducted a research project entitled "Design Analysis of V-Shape Dipole-Based Antenna for Radio Astronomy Application". He was supervised by Prof. Dr. Norbahiah Misran and Prof. Dr. Muhammad Tariqul Islam. During his Ph.D. term, he published several papers in indexed journals, e.g., "Effect of Parasitic Element on 408 MHz Antenna for Radio Astronomy Application" ,"Solar Flare M-Class Prediction Using Artificial Intelligence Techniques" and others.

We believe that the success of Dr. Radial Anwar is an inspiration and motivation to the fellow students of IPI in their research and education and bring more success in future endeavor.

INDUSTRY GRANT: THE COMPARISON OF INDOOR AIR QUALITY DURING NORMAL AND HAZE CONDITION AND ITS HEALTH ASSESSMENT FUNDED BY SHARP ELECTRONICS (M) SDN BHD

This is an industry funded project under the MOA between Universiti Kebangsaan Malaysia (UKM) and SHARP Electronics (M) Sdn Bhd. This project mainly focus on school environment and children and was conducted at SJKC Chung Kwok, a Government primary Chinese school, located in the Jalan Merpati, Kuala Lumpur. In parallel to the studies of indoor and outdoor air quality during haze and non-haze period, the school children were participated in their health risk assessment. In general, children are the most vulnerable to the exposure of hazardous pollutant as they have higher breathing rate than adults. The students from two classes were involved in this study with a particular consideration and objectives set in the project. A group of researchers led by Dr. Mohd Shahrul Mohd Nadzir from Centre for Tropical Climate Change System, Institute of Climate Change in UKM implemented this project.

PUBLICATION

KESAN HAKISAN PANTAI DAN KENAIKAN PARAS AIR LAUT DI BATU PAHAT (IMPAK KEPADA KOMUNITI SETEMPAT)
ISBN 978-967-0829-17-3

Sharifah Mastura Syed Abdullah, Maimon Abdullah, Khairul Nizam Abdul Maulud, Wan Hanna Melini Wan Mohtar & Norzatul `Ezzah Hasan

Kawasan kajian perubahan garis pantai di pantai barat Johor merangkumi garis pantai dari Sg. Kesang (utara) ke Tg. Piai (selatan) yang melibatkan daerah Ledang, Muar, Batu Pahat dan Pontian. Keluasan kawasan kajian adalah 167,486 km2 (termasuk Pulau Kukup dan Pulau Pisang) dan melibatkan garis pantai sepanjang 205.2 km. Keadaan garis pantai dikategorikan sebagai stabil, mendapan dan hakisan kategori 1, 2 dan 3. Sebanyak 38 titik rujukan dipilih untuk dianalisis perubahan garis pantai. Perbandingan dibuat dengan menggunakan peta topografi 1974 sebagai asas dan imej satelit bagi tahun 2010 dan 2011. Kawasan yang paling tinggi mengalami hakisan adalah di Pulau Kukup (barat daya garis pantai) dengan perubahan sebanyak -389.1 m dan perubahan tahunan adalah -10.5 m/tahun. Manakala kawasan yang serius mengalami pemendapan adalah di Tg. Segenting dengan perubahan sebanyak 609 m dan perubahan tahunan sebanyak 16.9 m/tahun. Melalui analisis bagi setiap titik rujukan tersebut, kira-kira 42% garis pantai adalah dalam keadaan stabil, 18% mengalami pemendapan dan 40% garis pantai mengalami hakisan. Majoriti keadaan garis pantai di bahagian utara kawasan kajian iaitu dari Sungai Kesang, Muar ke Ayer Baloi (Pontian) mengalami pemendapan. Hanya kawasan tertentu sahaja yang mengalami hakisan. Garis pantai yang mengalami hakisan banyak berlaku di Pontian hingga ke Tg. Piai. Pulau Kukup mengalami hakisan yang teruk terutamanya di bahagian utara garis pantai. Tanjung Piai mengalami hakisan pantai secara berterusan dengan kadar yang terkawal kesan daripada tindakan penebatan (mitigasi) yang dijalankan oleh agensi yang terlibat, khususnya Jabatan Perparitan dan Saliran.

PUBLICATION

KEPELBAGAIAN BIOLOGI EKOSISTEM SAWIT
Penerbit UKM: Bangi
ISBN 978-967-0829-17-3

RM 20.00 – 109 halaman (kulit lembut)
Salmah Yaakop, Maimon Abdullah & Izfa Riza Hazmi

Buku ini ditulis untuk menanamkan kefahaman asas tentang tanaman dagangan emas negara, iaitu kelapa sawit kepada khalayak umum. Buku ini dirangka bertujuan untuk memberikan pendidikan asas, menerangkan perkaitan dan kesan penanaman kelapa sawit kepada alam sekitar. Buku ini juga diharapkan menjadi pakej pengajaran umum dengan menjadikan kelapa sawit sebagai kunci asas utama modul ini. Objektif utama penghasilan buku ini adalah untuk memberikan pengenalan dari pelbagai aspek kelapa sawit, biologinya, produk yang berjaya dihasilkan dan tidak dilupakan mengenai kepelbagaian flora dan fauna yang wujud di dalam ekosistem sawit secara khususnya. Beberapa perkara penting yang difokuskan antaranya mengenai biologi pokok sawit, proses penanaman berkesan hingga ke tuaian hasil sawit, hasil produk makanan daripada sawit, pengenalan ke atas jejak karbon, kesan perubahan iklim dan impak ke atas ekologi dan sosioekonomi industri sawit. Setiap bab dihubungkan antara satu dengan lain dan memberikan penjelasan ringkas tentang industri perkembangan sawit dengan hubungannya dengan dunia. Secara umumnya, teks yang digunakan adalah ringkas bagi menarik minat pembaca tanpa mengenepikan maklumat akademik. Sebagai contoh, nama spesies haiwan dan tanaman diberikan nama Latin dan maksud saintifiknya dijelaskan semudah yang mungkin. Buku ini juga diselang selikan dengan maskot kartun yang berwarna-warni yang mewakili empat spesies dominan yang terdapat dalam ekosistem sawit, iaitu Elaies (Pokok Sawit), Elai (Kumbang Pendebunga), Tyto (Burung Jampuk) dan Dory (Semut) untuk menarik minat dan perhatian pembaca. Diharapkan, buku asas ini mampu memenuhi objektifnya dan berjaya dipersembahkan sebagai prototaip yang amat berguna dan bermutu dalam penghasilan produk pendidikan untuk generasi kini dan akan datang.

PUBLICATION

BUKU AKTIVITI KEPELBAGAIAN BIOLOGI EKOSISTEM SAWIT

Penerbit: Institut Perubahan Iklim, UKM

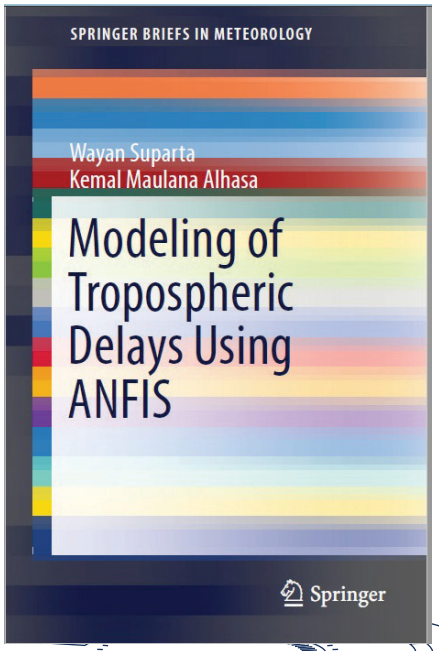
ISBN 978-967-0829-18-0

RM 10.00 – 50 halaman (kulit lembut)

Faszly Rahim, Salmah Yaakop, Izfa Riza Hazmi & Maimon Abdullah

Buku Aktiviti ini merupakan gandingan kepada Buku Kepelbagaian Biologi Ekosistem Sawit (Buku Asas). Objektif utama Buku aktiviti ini adalah supaya hasil pembacaan dan kefahaman Buku Asas dapat difahami dan dinilai sebagai hasil pembelajaran mengenai pelbagai aspek biologi dan sosioekonomi pokok sawit dan produk-produk hasilannya, serta kepelbagaian flora dan fauna tropika di dalam ekosistem sawit. Maka Buku Aktiviti ini tidak boleh digunakan secara kendiri. Buku ini telah disusun dengan pelbagai bentuk aktiviti yang kreatif dalam proses pembelajaran dengan aktiviti mengisi tempat kosong, meletakkan kata kunci bagi gambar/ilustrasi, memadankan istilah, dan menyelesaikan teka silang kata dengan iringan empat maskot sebagai rakan belajar kanak-kanak, iaitu Elaies (Pokok Sawit), Elai (Kumbang Pendebunga) Tyto (Burung Jampuk) dan Dory (Semut). Selain, itu aktiviti kreatif melukis dan mewarna, olahan seni, ujikaji mudah dan simulasi yang menjelaskan konsep tertentu juga dimuatkan dalam Buku Asas ini. Sebahagian aktiviti memerlukan kemahiran berfikir aras tinggi yang dapat mencabar naluri ingin tahu dan minda pembaca bagi membantu penghayatan terhadap Buku Asas. Uniknya buku ini ialah ia memuatkan juga ciptaan asli ikrar "Palma Emas Harapan Malaysia", Lagu Palmas Lasales oleh Dr. Fuzz dan muka surat Skuad Palma Emas. Diharapkan Buku Aktiviti bersama-sama buku asas dapat menjadi suatu prototaip dan kit pencetus bagi penghasilan produk pendidikan lain yang lebih kreatif, menarik dan bernilai bagi generasi masakini dan akan datang bagi mempertingkatkan lagi kefahaman mengenai tanaman emas negara ini.

PUBLICATION



MODELING OF TROPOSPHERIC DELAYS USING ANFIS SPRINGER INTERNATIONAL PUBLISHING
ISBN 978-3-319-28435-4

Wayan Suparta, Kemal Maulana Alhasa

Tropospheric delay is one of the atmospheric quantities, which today plays a crucial role in meteorological studies and weather forecasts as well as the positioning accuracy in altitude determination. The current state analysis revealed that the tropospheric delay is retrieved from the Global Navigation Satellite System (GNSS) receivers, which is known as the total troposphere zenith path delay (ZPD), or often referred to as zenith tropospheric delay (ZTD). In this method, GNSS (e.g., Global Positioning System (GPS) for simplicity) satellite sends electromagnetic signals through the atmosphere to a receiver on the ground at a fixed location. The electromagnetic signals are delayed due to the high amount of dry gas and water vapor in the troposphere layer. Total delay in the GPS signals is measured, and ZPD is obtained from a summation of dry and wet components (Hofmann-Wellenhof in Atmospheric effect on the global positioning system, theory and practice. Springer, Berlin, 2001). Because of the importance of ZPD data, Byun and Bar-Sever (Adv Eng Soft 31:312-321, 2009) have updated the legacy of new ZPD products for all available IGS stations with improving consistency of time series, which enhance climate studies.

AWARDS AND RECOGNITIONS

A New Double-Negative Metamaterial Design for Electromagnetic *A*bsorption Reduction in Human Head

Researchers: Dr. Mohamad Rashed Iqbal Faruque, Prof. Dr. Mohammad Tariqul Islam and Prof. Ir. Dr. Mardina Abdullah

Activity/Programme: 14th International Conference and Exposition on Inventions by Institutions of Higher Learning (PECIPTA'15)
Achievement: Gold Medal
Date and Venue: 4-6 December 2015, Kuala Lumpur Convention Center (KLCC)

Development of Precipitable Water Vapour Monitoring System for Weather Forecasting

Assoc. Prof. Dr. Wayan Suparta and Mr. Kemal Maulana AlHasan

Activity/Programme: International Invention, Innovation and Design Johor 2015 (IIID Johor2015)
Achievement: Silver Medal
Date and Venue: 29 October 2015, Amansari Resident Resort, Johor

AWARDS AND RECOGNITIONS

Space Weather Monitoring System (UKM-SID)

Researchers: Prof. Ir. Dr. Mardina Abdullah, Assoc. Dr. Badariah Bais, Assoc. Dr. Rosadah Abd. Majid, Dr. Gan Kok Beng, Dr. Sabirin Abdullah, Ms. Siti Aminah Bahari and Mrs. Noridawaty Mat Daud

Activity/Programme: Selangor My Innovation Challenge Program 2015
Date and Venue: 29 Oktober 2015, SUK Office of Selangor State Government
Achievement: Appreciation Award

Space Science Learning Enrichment Activity through Ionosphere Monitor System using Raspberry Pi

Sijil Penghargaan

Prof. Ir. Dr. Mardina Abdullah, Prof. Madya Dr. Rosadah Abd Majid, Prof. Madya Dr. Badariah Bais, Dr. Sabirin Abdullah & Dr. Gan Kok Beng

telah memenangi

PINGAT EMAS

Dalam

PERTANDINGAN
ANUGERAH INOVASI PEMBELAJARAN DAN PENGAJARAN

Pada

HARI INOVASI FAKULTI PENDIDIKAN KALI KE-3

Tarikh

30 September 2015

Bertempat di

Dewan Budiman, Fakulti Pendidikan

PROF DR LILIA HALIM
Dekan
Fakulti Pendidikan
Universiti Kebangsaan Malaysia

Prof. Ir. Dr. Mardina Abdullah, Assoc. Dr. Badariah Bais, Assoc. Dr. Rosadah Abd. Majid, Dr. Gan Kok Beng and Dr. Sabirin Abdullah

Activity/Programme: Competition in Teaching and Learning Innovation Award in conjunction with Faculty of Education Innovation Day 2015
Date and Venue: 30 September 2015, Faculty of Education, UKM
Achievement: Gold Medal

INDUSTRY GRANTS

JABATAN ALAM SEKITAR MALAYSIA
PROGRAM DATA ALAM SEKITAR DI SEPANJANG SELAT JOHOR DAN SEKITAR BATUAN TENGAH DAN TUBIR SELATAN

COSTS : RM 2,929,212.68
DATE : 01/09/2015 – 30/09/2017

UNITED NATIONS EDUCATIONAL, SCIENCETIFIC AND CULTURAL ORGANIZATION (UNESCO)

DEVELOPMENT OF TRAINING MATERIAL ON CLIMATE CHANGE EDUCATION (CCE) FOR SMALL ISLAND DEVELOPING STATES IN ASIA PACIFIC

COSTS : RM 203,298.48
DATE : 12/10/2015 – 11/10/2016

YAYASAN PENYELIDIKAN ANTARTIKA SULTAN MIZAN

The use of first portable Gas Chromatography GC with electron capture detector (ECD) in the determination of Very-Short Live Halocarbons (VSLH) in the atmosphere and coastal water of Antarctic

COSTS : RM 147,000.00
DATE : 01/01/2015 – 31/12/2017

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