



Space Activities in Malaysia

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UNIVERSITI KEBANGSAAN MALAYSIA
(UKM - National University of Malaysia)**

Space Related Institutions in Malaysia

Malaysian
National Space
Agency
(ANGKASA)

Astronautic
Technology
Sdn Bhd
(ATSB)


Institute of
Space Science
(ANGKASA)

Researchers from
other universities
and research institutions



Activities

- Research and development
 - Microgravity Sciences
 - Space Weather
 - Astronomy
 - Scientific Payloads
 - Others
- Networking/collaborations/conferences
- Capacity Building
- Infrastructure and Policy
- Education



National Microgravity Science Program

- **First Malaysian Astronaut (Angkasawan) to the ISS**
- **Experiments involving Malaysian universities, research institutes**
- **Malaysian contribution to scientific advancement**
- **More researchers in the field**
- **Continued collaborations: NASA, ESA, JAXA and Russia**
- **Possible spin-off and Education**

Experiments in Space

- **Protein Crystallisation**
 - *Lipase enzymes*, Prof. Raja Nor Zaliha Raja Abdul Rahman, MARA University of Technology (UiTM)
- **Microbes**
 - *Enterobacter Cloacae*, Prof. Ramelah Mohamed, UKM
 - *Acinetobacter Baumannii*, Prof. Sazaly Abu Bakar, Universiti Malaya (UM)
- **Cells**
 - *Endothelial*, Prof. Hapizah Mohd Nawawi, UiTM
 - *Osteoblast*, Prof. Mohamed Saifulaman Mohd Said and Prof. Gabriele Ruth Anisah Froemming, UiTM
 - *Eukaryotic*, Prof. A. Rahman Jamal, UKM
- **Food**
 - Malaysia Agricultural Research & Development Institute (MARDI)

Outcomes - General

- **Patent filings (in Malaysia, some in the US)**
- **Manpower development: PhD's, MSc's and RO's**
- **Publications in international journals and conferences**

Outcomes - Specific

- **Protein Crystallisation**
 - Development of the scaling process for possible commercialisation
 - Continued collaboration with JAXA with more space flights
- **Microbes**
 - Development of microarray
 - Development of portable steriliser & laminar hood steriliser for possible commercialisation
 - On-going metabolic path study for new antibiotic

Outcomes - Specific

- **Cells**
- ***Endothelial***
 - (HUVEC) cell culture optimisation in the Fluid Processing Apparatus (AFP) – live cells after flight
 - Establishment of Cell Culture Lab in UiTM
 - Continue study on cardiovascular health in space (MARS500 Project)
- ***Osteoblast***
 - Live cells after flight
 - Trade mark: RAP-NHOst (re-adapted normal human osteoblast)
- ***Eukaryotic***
 - Malaysian experimental design (hardware design to prevent contamination)
 - Technique to optimise Ribonucleic Acid extraction
 - Establishment of Genetic Mutation research lab

Space Weather



- **A committee (National Space Agency, universities, research institutes and government departments) set up in 2010 to take up program under ISWI**
- **MAGDAS – On-going project between UKM, National Space Agency and Space Environment Research Centre (SERC) of Kyushu University, Japan**

Research Activities

- **Ionospheric studies**
- **Precipitable water vapour characterization**

Collaborators (Arctic projects):

- National Institute of Polar Research (NIPR) Japan
- Science Institute of University of Iceland (SIUI)



HUSAFELL, ICELAND

Research Activities



Collaborators
(Antarctic
projects):

- Antarctic New Zealand (ANZ)
- University of Canterbury, New Zealand



Other Research Activities

- **Ionospheric studies in the Equatorial region (with other local universities)**
- **Astronomy – involving the Langkawi National Observatory under the National Space Agency**
- **Satellite Technology, Nanosatellites, payloads (with the National Space Agency and ATSB)**

**2009 International Conference on
Space Science and Communication (IconSpace 2009)**

Port Dickson, Malaysia, 26-27 Oct. 2009





Association of Space Explorers
XXIII Annual Planetary Congress, Malaysia 2010

Sanctioned by
ASE



Event
Management



ASE XXIII Annual Planetary Congress

- Date: 5 – 10 October 2010
- Venue: Multi-centres
- Participants: ~ 80 Astronauts
- UKM Program:
 - 6 October 2010 (Wednesday) : Technical Sessions
 - 7 October 2010 (Thursday) : Community Day
- Theme:
 - 1 Planet 1 Hope 1 Future



**2011 International Conference on Space
Science & Communication (*IconSpace2011*)**

The Gurney Resort, Penang, Malaysia

12-13 July 2011

www.ukm.my/inspace

Institute of Space Science

- **Established 2003**
- **6 Academics (inc. full-time research fellows*)**
- **20 Associate research fellows**
- **8 support staff**
- **18 PhD and 18 MSc research students**

***inc. the Malaysian Astronaut**



Institute of Space Science

- **Multidisciplinary research in Space Science, Technology, Applications and Governance**
- **Capacity building**
- **Promotion of Space Science and support the National Space Program**



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Thank You