

20  
12

RESEARCH  
INVENTION  
INNOVATION &  
DESIGN

7 - 8 NOVEMBER 2012

DEWAN TAMING SARI  
UNIVERSITI TEKNOLOGI MARA  
KAMPUS ALOR GAJAH  
MELAKA

# innovation for sustainable growth



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Invention Category

Innovation Category

Design Category

Exhibition Concept

Sponsorship

Supported Institution

Acknowledgement



## WELCOME MESSAGE

Assalamualaikum wbkt and Salam One Malaysia

First of all, I would like to congratulate the Research, Industrial Linkages and Alumni Melaka for yet another successful organization of the Research, Invention, Innovation and Design (RIID) exhibition 2012.

This competition and exhibition is the fourth effort by the Research, Industrial Linkages and Alumni in exhibiting the outcomes of research, invention and innovation by our own versatile lecturers and students and also participation from other IPTAs, IPTS and Schools. I believe that this exhibition is definitely a good avenue for them to participate actively and progress collaboratively in the field of innovation and research.

I am confident that the Research, Industrial Linkages and Alumni in the Melaka campus will continue to address the various challenges that we are constantly facing with a view towards multidisciplinary solutions. Hence, the present exhibition with the theme 'Innovation for Sustainable Growth' is appropriate, and I am certain that this exhibition will bring about more collaborative research and publication.

I therefore would like to take this opportunity to extend a big 'Thank you' to the organizing committee of Research, Invention, Innovation and Design (RIID) 2012 and each and everyone who has made this exhibition a reality. I wish all researchers, lecturers and students a meaningful and enriching experience in coming up with new and innovative inventions. I wish to end with a note of thanks to the Research, Industrial Linkages and Alumni for a job well done.

Yours sincerely,  
Y.Bhg.Prof Madya Dr Mohd Adnan Hashim  
Rector  
Universiti Teknologi MARA Melaka  
November 2012

# **BACKGROUND OF PENYELIDIKAN, JARINGAN INDUSTRI & ALUMNI (PJI&A)**

PJI&A established in April 1980, started as the Research Management Unit (RMU) or IRDC and was formerly known as the Planning, Research and Development Centre. However in September 1987, IRDC was restructured with its heightened importance in research and consultation in UiTM and was divided into two units, Research and Consultancy Centre (RACC) and Planning and Evaluation Unit. This centre was then renamed Research and Consultancy Bureau in 1994 and on 15 July 2003 it became Institute of Research, Development and Commercialisation (IRDC).

With the mooring of the Deputy Vice Chancellor in March 2008 to take over the intellectual property and commercialisation portfolio, IRDC was given the responsibility to maximise innovation and increase the number of research which will later be published in high impact journals. Ensuing this, on 31 July 2008 IRDC became the Research Management Institute (RMI) to synchronise with UiTM's aspiration to become a Research University that will develop innovation activities and new research. In branch campuses RMI is known as RMU. The department of PJI was officially established in 2009 headed by its Deputy Director, Associate Professor Dr. Roaimah Omar. Under her guidance, Invention, Innovation and Design (IID) started with the RIID showcase in August 2009 and this was followed by the first IID exhibition and competition in October 2009.

PJI&A is mainly responsible to manage, monitor and facilitate researchers in conducting their research in the area of science and technology, management and social sciences. It also provides consultation services to researchers and assisting them in their research claims. PJI&A also conducts seminars and workshops to encourage, motivate and train the academic and non-academic staff in research and consultation, securing research grants and projects, to manage good financing and also manages entrepreneurial and alumni activities.

## *Objectives*

- To promote world-class research.
- To administer, coordinate and provide service for research development, consultation and research publications.
- To provide assistance in exploring new subjects and identify niche area of interest.
- To disseminate information and provide ample training in research, consultation and publication of research.
- To disseminate information and provide ample training in research, consultation and publication of research.
- To provide related service through the latest technology.
- To assist in research publications for high impact journals.

## *Vision*

- To become the leading administrative centre for research, development, consultation and world-class research publication.

## *Mission*

- To enrich the academia, creative ability and innovation through quality service.



# INTRODUCTION TO RIID 2012

Innovation activities can be considered as an important mechanism for the nation's progress. RIID2012 Melaka anchors on the objective to produce individuals who are capable of formulating creative ideas and be highly competitive. UiTM is an institution which primarily puts emphasis on an innovative culture among its staff and students to form a critical thinking society, possessing creativity skills and elevated knowledge. Aligned with the government's aspiration to cultivate innovation, UiTM Melaka has taken the initiative to organise RIID2012 Melaka Innovation Festival.

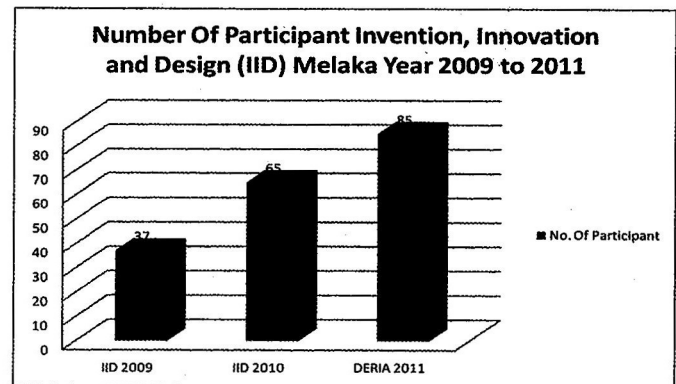
To raise the status of local universities globally or among the KPI which has been determined by the Ministry of Higher Education (MoHE) and to achieve the status of Research University, the total number of innovation being produced by a university is of utmost importance. Innovation is a vital catalyst to attain the status of a developed nation in the year 2020. Parallel to this, UiTM Melaka is carrying the nation's aspiration through innovation programmes wherein the staff and students' creativity and innovative abilities could be brought to greater heights through competitions and innovation exhibitions held every year.

To consistently produce innovation, IID competitions can act as one of the ideal channels or medium to ensure students, lecturers, administrative officers and the public to exhibit or display their products or prototype as well as new ideas that contain commercial values. The first IID held at UiTM Melaka level took place in 2009. It successfully exhibited more than 37 products. To continue the innovation culture within the campus community, IID competitions should be maintained.

The number of participation showed an encouraging response with 45 products being exhibited in the following year. The third IID known as DERIA 2011 was given a new facelift with an estimation of nearly 100 products that competed. Therefore, the Research, Industrial Linkages and Alumni Division (PJI&A) suggested organising the 4th IID in 2012. The IID competition this year is known as RIID2012 with the theme 'Innovation for Sustainable Growth'. The theme is chosen as innovation is believed to be the main impetus for growth that would spearhead the nation towards becoming a high income developed nation.

Therefore, the Research, Industrial Linkages and Alumni Division (PJI&A) has suggested to organise the 4th IID in 2012. The IID competition this year is known as RIID2012 with the theme '*Innovation for sustainable growth*'.

R= research, I = invention, I= innovation, D= design = RIID



# 1st IID: LET'S IID 2009

## Gold Medal

1. Asmaradana (Video clip) by FSKM
2. Pinggan Rasmi Istana Melaka by FSSR
3. Rekabentuk Maskot dan Logo SUKMA 2010 Melaka by FSSR
4. eXtention-C by FPN
5. CD Interactive Cartoons on Sexual Education for Young Children by FSSR
6. Grammar Mania – A Game For The Language Classroom by FPEND
7. Dara Pujaa (Short Film) by FKPM
8. Kalkulator Zakat Mudah Alih @zakatfon by IKAZ
9. Smart Easel by FSSR
10. Dhobi Wallah – The Last Laundrette Mohican (Documentary) by FKPM
11. e-Inventori ICT System by FSKM

## Silver Medal

1. Teguh 11 by FSSR
2. Songket Rasmi Negeri Melaka by FSSR
3. Workout with English by FSKM
4. Smart Drawing Board by FSSR
5. i-Masjid by IKAZ
6. Photo Gallery 2009, The Good, The Bad and The Ugly: Journey of Emotions (Sweats of Heart;s Desire) by FKPM
7. Dulang Bekas Kuih Raya 1 by FSSR
8. MyPJI-Portal by FSKM
9. Academic Predication Model Neural Network for Computer Sciences Students in UiTM by FSKM
10. Mobile Archery Scoring System by FSKM
11. e-Aduan ICT System by FSKM

## Bronze Medal

1. Sistem e- GL Staf by FSKM
2. Postcards as Affective Image Makers for Melaka Tourism by FSSR
3. Impact of Economic Growth on Air and Water Pollution in Malaysia by FPP
4. Snakes and Ladders (Literature) by FPEND
5. Reka Bentuk Komunikasi dalam Penjenamaan Semula Identiti dan Imej Lokasi Pelancongan di Negeri Melaka (Melaka River Cruise) by FSSR
6. Photo Gallery 2008, The Good, The Bad, The Ugly: Journey of Emotions (Life) by FKPM
7. Malaysian MotoGP 2009 Booklet by FFPM
8. Penghasilan Functional Sculpture/Decorative Objects/Design Object (Terendak Lampu Hiasan) daripada Logam Terpakai/Terbuang dengan Teknik Kimpalan Beracuan by FSSR
9. The Sale and Purchase Agreement: Creating and Innovative Glossary to Make It More Comprehensive
10. KOMIK: Catatan SI MAHASITUA by FSSR

Faculty with the Highest Number of Participation Category: FSSR

Best Booth Category: Asmaradana (Video Clip) by FSKM

Best Poster Category: Kalkulator Zakat Mudah Alih @zakatfon by IKAZ

# DERIA 2011

## Best Interactive Category:

2nd Group, Noor Suhaida binti Aziz / Nornadia binti Jonari, UiTM Melaka

## Best Young Inventor Category:

QI FIND (Qiblat Finder for the Blind)  
Mohd Alif bin Mansor (L), Sek.Men.Keb. Teknik Kuala Lumpur

## Best Invention Category (Open):

Welca Trolly OK2011  
Mohd Firhan bin Morni (L), UiTM Shah Alam

## Best Invention Category (Student):

Automatic Observer Vehicle  
Zulkarnain bin Jamak (L), Politeknik Ungku Omar

## Best Innovation Category (Open):

Smart Ampoule Breaker  
Amiruddin bin Mohd Yusuf (L), Hospital Segamat

## Best Innovation Category (Student):

PSC: A Public Sector Comparator (PSC)  
Khairizam Ismail (L), UiTM Shah Alam

## Bronze Medal

### Best Design Category (Open):

Portable Stool for "Home n Garden"  
Zulkarnain bin Hassan (L), UiTM Perak

### Best Design Category (Student):

Jelajah Melaka-Muar  
Nasya-Nani bt Mat Isa (L), UiTM Melaka

### Best Booth:

Pesanan Khidmat Masyarakat 'Kawan'  
Muhammad Azril Izuan bin Ramlan (L), UiTM Melaka

### Best Poster:

QI FIND (Qiblat Finder for the Blind)  
Mohd Alif Mansor (L), Sek.Men.Keb. Teknik Kuala Lumpur

### Diamond Award:

Smart Ampoule Breaker  
Amiruddin bin Mohd Yusuf (L), Hospital Segam

# PROGRAMME TENTATIVE

**Date : 7 November 2012 (Wednesday)**

TIME	TENTATIVE
8.15am	Registration
9.00am	Exhibition and Judging (Session
11.30am	Cultural Presentation
12.00pm	Lucky Draw I
1.00pm	Rehat / Makan Tengahari
2.30pm	Pameran & Perjurian (Sesi II)
3.00pm	Mind Challenging Game
4.00pm	Lucky Draw II
5.00pm	Adjournment
5.10pm	Registration for Tour of Melaka City
5.30pm -	Optional : River Cruise Melaka/
11.00pm	Jonker Street/Taming Sari

**Date : 8 November 2012 (Thursday)**

TIME	TENTATIVE
8.15am	Registration
8.30am	Arrival of Guest Speaker
8.35am	Breakfast
9.00am	Genovasi Briefing
10.00am	RIID 2012 Exhibition
11.00am	Lucky Draw 3
12.30pm	Break/ Lunch
2.00pm	Innovation Talk by Animosta Studios S/B
3.00pm	Arrival of PM Zulkifli Abdul Majid (Director of RIBU)
3.20pm	Welcome Prosession for VVIP, Rector and Deputy Rector UiTM Melaka
3.25pm	National Anthem and Wawasan Setia UiTM
3.30pm	Doa Recital
3.40pm	Opening Presentation
3.45pm	Speech by Chairperson of RIID 2012, UiTM Melaka
3.50pm	Speech by Rector
	Official Opening and Closing bby PM Zulkifli Abdul Majid ( Representing Assistant Vice Chancellor (Research) , RMI UiTM Shah Alam)
4.00pm	
4.20pm	Launching Gimmics – Multimedia Presentation
4.25pm	Visit to Exhibition Booths
4.40pm	Press Conference
5.00pm	Award Presentation
5.35pm	Closing Ceremony
5.40pm	Photograph Session
5.45pm	Tea Break



# COMMITTEE RIID 2012

## ■ Certificate

Ustz Husnul Rita bt Aris  
Pn Siti Hajar Abd Aziz  
Noofazreen Binti Mohd Aris  
Mariam Farhana  
Adibah Binti Bahori  
Pn Zaiton Hasan  
Cik Rabiah Ibrahim

## ■ Audio Visual and ICT Equipment

Puan Rohayu Hj. Ramli

## ■ Refreshment

Ustazah Noraini Ismail  
Vani a/p Tanggamani  
Siti Anis Nadia binti Abu Bakar  
Puan Siti Rohana binti Daud

## ■ Event Manager

Saloma Emang  
Zarina Begum Ebrahim  
Nurul Ain Mustakim  
Muna Kameelah Saudi  
En. Mohd Hatta Mohd Yatim

## ■ Logistic and Tour

Akmal Adanan  
Tania Maria Tangit  
Noor ibtisam Abdul Karim  
Abu Zaireen Abu Hassan  
Norfaezah Khalet

## ■ Montage

YM Tengku Shahril Norzaimi Tg. Hariffazillah

## ■ Video and Photographer

Shahril Anuar Abdul Ghalim

## ■ Innovation Talk

Pn Ilya Yasnorizar Ilyas  
Nadia bte Abdullah

## ■ Food Stall

Prof Madya Zaihan Abd. Latif  
Puan Nor Hamiza Mohd Noor

## ■ Judges

Prof Madya Dr Maheran Katan  
Dr. Shafinar Ismail  
Pn Alisa Ibrahim  
Pn Suhailah Kassim  
Ainaa Idayu binti Iskandar  
Azlin Zanariah binti Bahtar  
Nur Hidayah binti Zaini  
Nurhaslinda Hashim  
Ahmad Syaifullizan Zulkeefly  
Sulaiman Mahzan

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En. Mohd Radzie Mohd Ramli  
En. Mohd Hazrie Tahar  
En. Mohd Nor Rajian  
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En. Faizul Ab. Razak  
En. Ahmad Nasrin Mansor  
En. Yahya Abdul  
Pn. Murni Abu  
En. Amran Abdul Razak  
En. Nor Azizan Abdullah  
Pn. Nor Hidayah Baba  
Cik Siti Husnima Md Husin

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Isma Izza Mohamad Esa  
Pn. Rafidah Abdul Karim  
Nurul Huda Mohamad Saad

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Treasury Department, UiTM Melaka  
Corporate Office, UiTM Melaka  
Residence & College Management UiTM Melaka  
Security Unit, UiTM Melaka  
IPTA, IPTS, College & School  
All UiTM Branch Campus

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Innovation For Sustainable Growth  
An Innovative Exhibition Of Higher Learning Research

**13.*****Development of Fast Structural Dynamic FE Analysis Using Krylov Subspace Model Order Reduction (KS-MOR)***Institute For Infrastructure Engineering and Sustainable Management (IIESM),  
Faculty of Civil Engineering(FKA)  
UiTM Shah Alam

Dr. Norliyati Mohd Amin, Anizahyati Alisibramulisi

***Abstract***

A model order reduction has been utilized as a booster of FE analysis by using orthogonal basis vectors of the Krylov subspace. Krylov Subspace Model Order Reduction (KS-MOR) is one of projection based reduction method for spatially discretized time differential equation. The advantage of this method is it does not require solving eigenvalue problems but will retain to its original system. This research present a treatment of KS-MOR incorporating with finite element (FE) method for structure dynamic analysis subjected to the uncertainty of earthquake. In the numerical investigation, a 3D bridge model with different bearing system was solved to show performance of KS-MOR. One of the bearing system is classical steel hinge bearing hinge, the other is steel laminated rubber bearing. The efficiency in the CPU time is about 20-30 times faster than the conventional FEM. Application of KS-MOR to simulate large scale 3D model is a new invention in the area of computational mechanics.

**14.*****Dielectric Pyrochlores In Bismuth Magnesium Tantalate Ternary System***Jabatan Kimia  
Fakulti Sains  
Universiti Putra Malaysia

Dr. Tan Kar Ban, Prof. Zulkarnain Bin Zainal, Dr. Khaw Chwin Chieh, Tan Phei Yi, Dr. Chen Soo Kien

***Abstract***

The present invention relates to the synthesis and characterisation of bismuth magnesium tantalate dielectrics (BMT pyrochlores), and to their structural and electrical properties. Ceramic compositions produced in this invention include  $\text{Bi}_3\text{-Mg}_2\text{Ta}_3\text{O}_{14}$ ,  $\text{Bi}_2\text{Mg}_2/3\text{Ta}_4/3\text{O}_7$  and  $\text{Bi}_3+(5/2)\text{xMg}_2\text{-xTa}_3\text{-(3/2)xO}_{14\text{-x}}$ ; phase pure subsolidus solution as represented by  $\text{Bi}_3+(5/2)\text{xMg}_2\text{-xTa}_3\text{-(3/2)xO}_{14\text{-x}}$ , wherein  $0.12 \leq x \leq 0.22$  able to be produced. This invention also discloses a method of preparation of the BMT pyrochlore, in which  $\text{Bi}_2\text{O}_3$ ,  $\text{MgO}$  and  $\text{Ta}_2\text{O}_5$  in stoichiometric amounts are mixed homogeneously with acetone, pre-treated at  $300^\circ\text{C}$  to  $600^\circ\text{C}$  for at least one hour to ensure that the  $\text{Bi}_2\text{O}_3$  reacts to form less-volatile compounds, the pretreated powders are subsequently heated at  $800^\circ\text{C}$  overnight, and further synthesised at  $1025^\circ\text{C}$  for 48 hours, preferably with intermediate regrinding. The compositions of invention have outstanding bulk dielectric properties, e.g.,  $\epsilon'$  values of between 74 – 85 at frequency 1 MHz at  $\sim 25^\circ\text{C}$ ,  $\text{TCE}'$  of -158 to -328 ppm/ $^\circ\text{C}$  at 1 MHz in the range of  $\sim 25^\circ\text{C}$  -  $300^\circ\text{C}$  and  $\tan \delta$  in the order of  $10^{-3}$  at 1 MHz,  $\sim 25^\circ\text{C}$ . The bismuth magnesium tantalate dielectrics are suitable particularly for ceramic based capacitor application.