

3RD BRUNEI STUDENTS'
RESEARCH SYMPOSIUM
2016

Enhancing Research Prowess



PROCEEDINGS

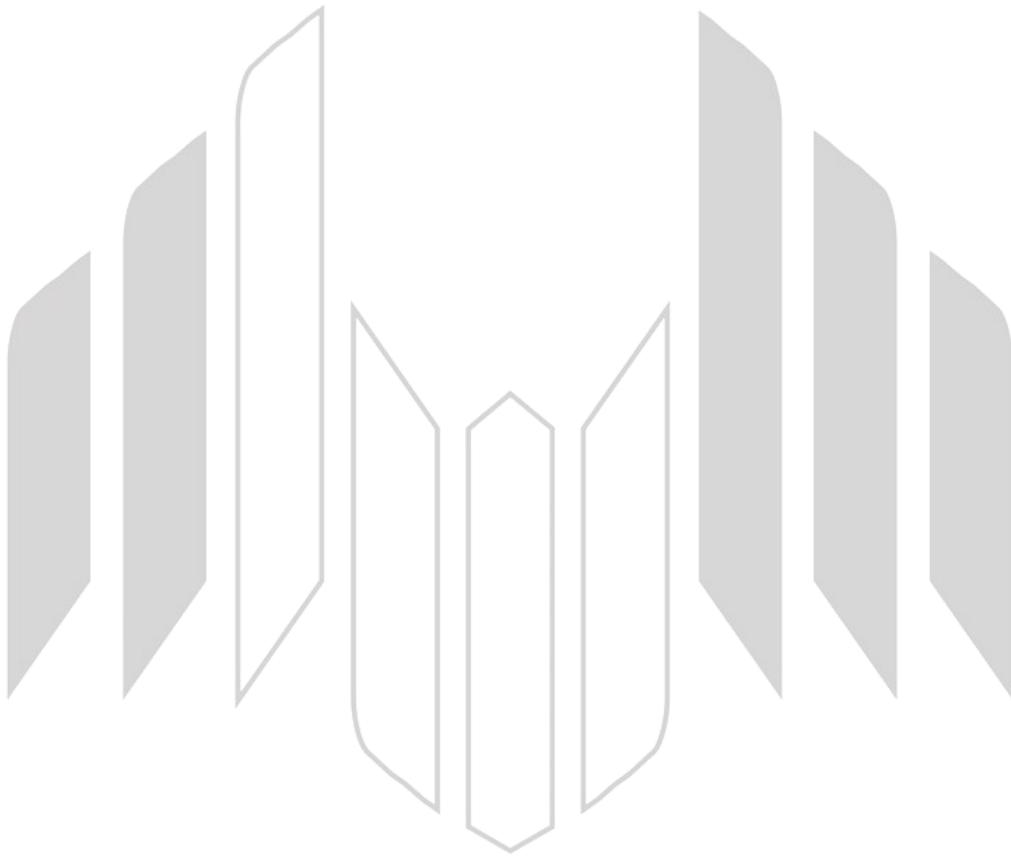


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FOREWORD

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ
الْحَمْدُ لِلَّهِ عَلَى كُلِّ مَرْكَبٍ وَالْحَمْدُ لِلَّهِ وَكَأَنَّ

Alhamdulillah the 3rd Brunei Students' Research Symposium (BSRS) was successfully organised again this year. I wish to thank those that have volunteered immensely to make the event a success.

One important thing that transpired was a solid picture on the importance of student research as one of the main backbones of Brunei's progress. This is through their creativity, curiosity, passion and critical mind which then manifest into the real world in the form of problematisation as well as providing valuable solutions to the world. Strong actions guided by clear mind will be the recipe for success.

This proceeding is conceived to spread this important message to as many relevant parties as possibly can. It is hoped that more support, both from public and private sectors, are given to researchers in the future due to their importance. Only then can Bruneians' research prowess be enhanced holistically.

I would like to encourage all my fellow Bruneians to push their education and development to its full extent. See the value of PhD not as "permanent head damage", but as an avenue to expand oneself and realise your full potential.

Truly, the value of knowledge is that of light guiding mankind through the darkness of ignorance and inaction. We all need to remember the nature of research, knowledge and truth so that their real value can truly shine.

"All humans are dead except those who have knowledge
and all those who have knowledge are asleep, except those who do good deeds
and those who do good deeds are deceived, except those who are sincere
and those who are sincere are always in a state of worry."

- Imam as-Syafie (may Allah have mercy upon him)

Wassalam,
Mohammad Iznan Haji Tarip
Co-Chair, BSRS2016
President of Brunei Postgraduate Society 2016/2017,
Postgraduate Secretary, Brunei Students' Union



WELCOME BY THE CHAIR

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ
السَّلَامُ عَلَيكُمْ وَرَحْمَةُ اللَّهِ وَبَرَكَاتُهُ

Welcome to the 3rd Brunei Students' Research Symposium,

Follow up to the success of BSRS2013 "Towards a knowledge-based economy" and BSRS2015 "Inspiring Creative Research", we continue to have this year's theme: "Enhancing Research Prowess". We hope that this one-day symposium filled with interesting presentations will encourage our visionary generation towards research and innovation.

We are delighted to welcome our keynote speaker, Professor David Koh and two panel speakers, Mr Javed Ahmad and Mr Allen Lai. We are looking forward to their talks related to research and economic development in Brunei and we hope to benefit from their experiences.

Two highlight speakers have been selected from the student presenters, who will showcase their research in the morning session. Sixteen student presenters from across different disciplines will be featured in the afternoon session. For the first time this year, there will be a showcase of students' research posters.

We hope that this symposium will provide an opportunity for students to be acquainted with other fields of research and to receive beneficial feedbacks from their colleagues.

We would like to express our gratitude to the keynote speaker, panel speakers and student presenters for their contribution to a stimulating programme for today. My utmost gratitude goes to my committee members for their continuous support and dedication in preparing this exciting symposium. A special thanks goes to our collaborator, Imperial College Union Bruneian Society (ICUBS) for their support in organising this symposium here at Imperial College London.

We would also like to extend our sincere appreciation to our sponsors and advisors for making this event possible. On behalf of the organising committee, I would also like to thank you, the attendees for being part of BSRS 2016.

We hope that you will have an inspiring and memorable day!

Wassalam,
Dk Nuramalina Hafizah Pg Hj Mumin
Chair, BSRS2016
President of Brunei Postgraduate Society 2015/2016,
Postgraduate Secretary, Brunei Students' Union



INTRODUCTION

The Brunei Students' Research Symposium (BSRS) 2016 is the flagship event run by the Brunei Postgraduate Society (BPS) in the United Kingdom and Eire. The one-day symposium is targeting Bruneian students interested in research, in line with the event's theme, "Enhancing Research Prowess". The event is a platform to allow these students to present any aspect of their current, previous or future research.

The overall aim of the symposium is for students to showcase their research to others, generate quality discussions amongst attendees regarding the research areas, and in turn, it would potentially elevate research qualities and quantities in the future.

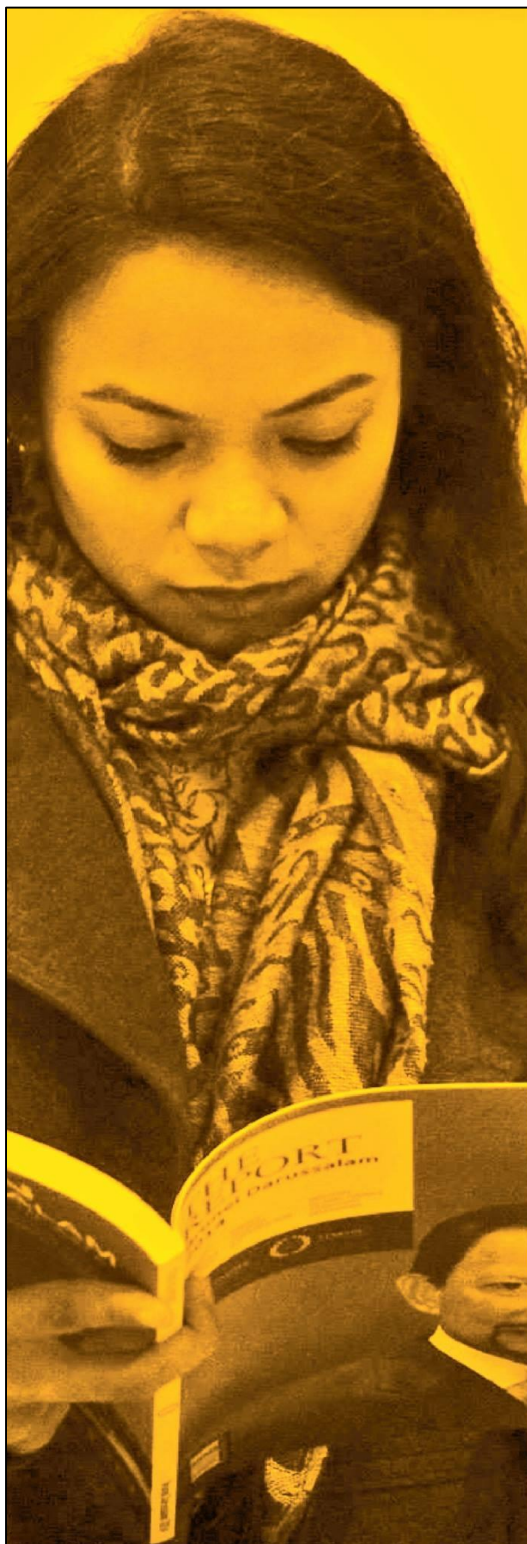
The aim of the event is in line with His Majesty's Titah regarding the need for students to enhance their research prowess in order to realise Wawasan 2035:

"Students are the pillars for progress and excellence centred on the knowledge-based economy and innovation in line with the country's vision to develop knowledgeable, skilful and civilised citizens and residents"

"I have previously emphasised that increased economic growth can be achieved by giving priority to increasing productivity through research and use of the latest technology"

Excerpts from the Titah of His Majesty the Sultan and Yang Di-Pertuan of Brunei Darussalam on 30th December 2012 and on the eve of New Year 2016

BSRS 2016 is the 3rd instalment of BSRS since 2013 and the 5th symposium since 2009 including Brunei Postgraduate Symposium 2009 and 2010.



Want to enhance your research prowess and conquer the wild world of research?

We're now calling for Abstracts for the **3rd Brunei Students' Research Symposium 2016**

THEME FOR THIS YEAR

Enhancing Research Prowess

DEADLINE

12th February 2016

Those who are eligible are welcome to submit a **200 words abstract** for the 3rd BSRS in March 2016



For more information,
please visit bsrs2016.blogspot.co.uk

For enquiries, please contact bsrs.enquiries@gmail.com
or Facebook message us at **Brunei Students' Research Symposium**

RUNNING ORDER

Morning session

- 0845 Arrival of presenters and attendees (registration opens)
- 0930-0945 Arrival of invited guests
- 1000 Arrival of Guest of Honour

Opening Ceremony & Plenary Session (Lecture Theatre G20)

- 1010 Recital of Surah and Doa by BSRS Co-Chair
Welcoming remarks by BSRS Chair
- 1020 Keynote speech: **“Research Climate in Brunei”**
YM PROF DAVID KOH
Assistant Vice Chancellor and Vice-President (Research and Innovation) of University Brunei Darussalam
- 1105 Panel Discussion: **“Globalising Brunei: Where are we in this interconnected world?”**
Panellists:
MR JAVED AHMAD, *Managing Director of Fajr Capital*
MR ALLEN LAI, *CEO of Asia Inc Forum*
- 1150 Student presentation #1
“Control of chloroplast development and its potential application in agriculture”
YM SABRI ALI, University of Oxford
- 1210 Student presentation #2
“The Forgotten Reformation: A critical study of the vision to transform Brunei Darussalam into becoming a ‘Dhikir Nation’”
ABD MU’IZZ ABD KHALID, University College London
- 1230 Poster session, networking lunch and Zohor prayer
Room 3.01D/E

Afternoon session

	Panel A (Lecture Theatre G1)	Panel B (Lecture Theatre G20)
1345	Opening remarks by panel moderator	
1350	Publics opinion on renal transplantation TEO TING TING St Georges, University of London	Police liability and immunity MING WEI CHONG BPP Law School

1410	Predicting The Effect of Extensive Neuro-rehabilitation in Post Stroke Patients UMMI SALWA SUHAIMEI University College London	Death of Coral Reefs in Changing Climate? May the Legal and Non-Legal Force be with the Tropical Islands' States AQILAH@SYAFINA ABD HADZID Queen Mary University of London
1430	Are CRISPR/Cas systems ready for genome editing in humans? MUHD HIDAYAT HJ AHMAD Imperial College London	The ASEAN Way: Can It Stand the Test of Time? SAIFUDDIN PG DP HJ SALLEHUDIN University of Warwick
1450	CXCL12 Induced Migration Relies On Specific Signalling Cascades In Different Cell Lines POH HUI GOH University of East Anglia	Across the Zooniverse: A technofeminist analysis of online citizen science KHAIRUNNISA IBRAHIM University of Oxford
1510	Break and Asar prayer	
	Panel C (Lecture Theatre G1)	Panel D (Lecture Theatre G20)
15.45	Opening remarks by panel moderator	
1550	Electrochemical and Spectroscopic studies of Greigite for CO2 reduction SITI NURUL AZIAN ZAKARIA University College London	Wisdom to bridge sciences MOHD IZNAN HJ TARIP Lancaster University
1610	Organic Electronics: Do contaminants degrade or enhance performance? MUHD SHU'AIB KAMALUDIN University College London	Exploring the role of globalization as an agent of development DK NUR QAMARINA PG LUBA University of Sheffield
1630	Environmental stress cracking of thermo-plastics: a fracture mechanics approach AYYUB KAMALUDIN Imperial College London	Petrocultures in Asia: Towards A Better Dissemination of Narratives on Oil SARAH GHAZALI University College London
1650	Electrical Properties of Doped and Undoped Haematite, α-Fe₂ WAN MUHD NAQIB FIDA'YI HJ HAMIIDON University of Sheffield	Assessing Bruneian Malays' language proficiency in language psychology research MOHAMMAD FARHAN BIN MURNI University of Nottingham

Closing ceremony (Lecture Theatre G20)

1715	Remarks by BSRS Co-Chair Presentation of certificates of participation to presenters Presentation of certificates of appreciation to committee and volunteers Recital of Surah Al-Asr
1745	Close of day

KEYNOTE SPEAKER



Professor David Koh

MBBS, MSc, PhD, FFOM, FFOMI, FFPH, FAOEMM
Vice-President (Research and Innovation) and
Assistant Vice Chancellor

Distinguished Professor of Occupational Health and Medicine
Institute of Health Sciences
University Brunei Darussalam
Email: david.koh@ubd.edu.bn

David Koh qualified in medicine in Singapore, and completed his postgraduate training in the United Kingdom. He worked in Singapore for over 25 years where he served as Chair of the Department of Community, Occupational and Family Medicine and Director of the Centre for Environmental and Occupational Health Research, NUS, before joining the University Brunei Darussalam in 2012. He is currently a Distinguished Professor, the Vice-President (Research and Innovation) and Assistant Vice-Chancellor.

His research and teaching interests are in occupational and environmental health - with particular interests in salivary biomarkers, occupational dermatology and education and training in occupational health. He has >250 peer reviewed publications and edited several books, including the Textbook of Occupational Medicine Practice, now in its 3rd edition. Professor Koh serves on advisory and editorial boards of major international occupational and environmental health journals, and has served as a WHO consultant in occupational health in several countries in the Asia-Pacific such as Vietnam, Myanmar, Indonesia and the Solomon Islands.

For his international work in occupational and environmental health, he has been conferred the Smiley Medal from the Faculty of Occupational Medicine of the Royal College of Physicians Ireland; the Wilf Howe Memorial Prize from the Faculty of Occupational Medicine, Royal College of Physicians London, and the Outstanding Volunteer Award from the Singapore International Foundation.

PANEL SPEAKERS



Mr Javed Ahmad
Managing Director of Fajr Capital

Javed Ahmad is a Managing Director at Fajr Capital. He was previously the Managing Director of Bank Islam Brunei Darussalam and also served as Managing Director at HSBC Amanah, where he led HSBC Amanah's RETAIL FRANCHISE in Saudi Arabia and global wealth management business, overseeing a wide range of funds across diverse asset classes. He has a long track record of successful corporate finance transactions in Islamic finance at HSBC Amanah, at RHB Sakura Merchant Bankers Berhad as a General Manager, and at the DMI Group. Mr. Ahmad, who is a resident of Brunei, holds an MBA from the University of Bradford.



Mr Allen Lai
Director of Asia Inc Forum

Allen Lai is a Director of Asia Inc Forum, a business-public policy dialogue facilitator. Asia Inc Forum is in the business of bringing people together to discuss key business issues. They aim to be a uniquely Asian voice that highlights perspectives on the central economic and business challenges confronting the region. Through Asia Inc Forum he has been involved in planning, structuring and executing numerous APEC CEO Summits across the Asia Pacific since 2000 featuring the Presidents, Prime Ministers, CEOs and Thought Leaders of the region. He has a particular interest in working with organisations and companies in positioning and branding themselves through such high level platforms and through the media. Asia Inc Forum has been strategic partner to 10 of the past 13 summits. For many years, Allen was a news anchor and business television programme host for Radio Television Brunei. He is a Queen Elizabeth II Chevening Scholar with an MA Marketing from the University of the West of England in Bristol. He holds an undergraduate degree in Business Administration from the University of Brunei Darussalam.

LIST OF PARTICIPANTS

No.	FULL NAME	UNIVERSITY/ORGANISATION
1.	Aainaa Sofiyah Bakir	University of Reading
2.	Abdul Afiq Bin Haji Abu Bakar	University of Reading
3.	Abdul Khaliq Bin Hamdani	University of Reading
4.	Abdul Mu'izz Bin Abdul Khalid	University College London
5.	Ak Muhammad Saifuddin bin Pg DP Hj Sallehuddin	University of Warwick
6.	Amalina Mumin	University of Oxford
7.	Ayyub Kamaludin	Imperial College London
8.	Dk Amal Syahida Binti Pg Hj Md Tahir	University of Exeter
9.	Dk Nur Qamarina Pg Luba	University of Sheffield
10.	Dk Nurul Hafizah Pg Mohd Noor Sufian	BSUnion
11.	Durrah Nafeesah Idris`	Royal Holloway University
12.	Fatin Nadia Haji Katri	Cardiff University
13.	Hafizah Aziz	University of Reading
14.	Hajah Fatin Ameera Binti Hj Mohd Yaakub	University of Bath
15.	Hajah Nordiyannah Haji Sabtu	Queen Mary University of London
16.	Ika Nurlaila	University of Birmingham
17.	Ira Kartika Dewi Sabli	Imperial College London
18.	Izni Azrein Bin Noor Azalie	University College London
19.	Izzaty Afafina Haji Mohammad	University of Reading
20.	Jah Izzati Haji Jaidin	University of York
21.	Khairunnisa Ibrahim	University of Oxford
22.	Liyana Ahmad	Imperial College London
23.	Madihah Harun	University of Reading
24.	Maziah Haji Amran	King's College London
25.	Ming Wei Chong	BPP law school
26.	Mohamed Syafiqayuddin Tuah	Brunel University London
27.	Mohammad Farhan Bin Murni	University of Nottingham
28.	Mohammad Iznan bin Haji Tarip	Lancaster University
29.	Mohammad Sabri Bin Mohd. Ali	Oxford
30.	Muhammad Adi Aiman Bin Haji Rusli	University of Southampton
31.	Muhammad Hamizan Haji Zaini	Imperial College London

32.	Muhammad Hidayat bin Haji Ahmad	Imperial College London
33.	Muhammad Hilmi Bin Latip	Queen Mary University of London
34.	Muhammad Shu'aib Kamaludin	University College London
35.	Muhammad Zikri Rifa'ie Haji Zulkifli	University College London
36.	Muhd Haziq Fikry Abdul Momin	Queen Mary University of London
37.	Muhd Syafi Kamal	University of Reading
38.	Najrien Bin Juani	University of Reading
39.	Nur Atikah Binti Sapar	University of Exeter
40.	Nur Jair	N/A
41.	Nur Syasya Sukarneva	Imperial College London
42.	Nurbazilah Jamaludin	London School of Economics and Political Science
43.	Nurul Bazilah Bakiri	King's College London
44.	Nurun Nazihah Mohamad Yasmin	Imperial College London
45.	Poh Hui Goh	University of East Anglia
46.	Rabeah Adawiyah Abdul Razak	University of Oxford
47.	Rasyiqah Nuraiziz	University College London
48.	Rozana Mustafa	Imperial College London
49.	Sarah Ghazali	University College London
50.	Siti Nurul Azian Zakaria	University College London
51.	Siti Nurul Bazilah Bte Haji Mohaimin	King's College London
52.	Tay Weixiong	Imperial College London
53.	Teo Ting Ting	St. Georges, University of London
54.	Wan Muhammad Naqib Fida'iy bin Haji Hamidon	University of Sheffield
55.	Wan Uliaya Najdah Haji Hamidon	University of Bath

Also present are officers from High Commission of Brunei in London and Brunei Investment Agency, London.



SUMMARY OF KEYNOTE SPEECH

Topic: Research Climate in Brunei

Research is important to the development of Brunei, and Brunei has set up institutions and schemes to support research activities. This fact is explained by Professor David Koh in his capacity as Vice-President (Research and Innovation) and Assistant Vice Chancellor of University Brunei Darussalam (UBD).

Focusing of UBD as an example, historically the institution has concentrated on teaching rather than research. But after 2010, activities relating to research publication have grown exponentially. This trend is expected to continue in the future. Research is done not only locally but also in collaboration with other institutions globally.

There are a number of research funding available for Bruneians. The main three are as follows:

1. Brunei Research Incentive Scheme (BRISc), pioneered by Brunei Economic Development Board, is a cost-sharing grant to support private sector R&D activities and attract foreign companies to conduct research activities in Brunei while working along with local agencies,
2. Brunei Research Council, Brunei, funds research activities that is of national importance, and
3. University Research Grants, which comes from the university itself.

UBD will also help to secure external funding, but this can be very challenging due to researchers' limited experience.

One may ask what impact do researchers have on the real world. Some would think that they only stay in their “Ivory tower” and simply just publish articles. David explained that UBD, through its Research and Innovation office, do not only look at publications but also the connections from universities to industries. This may be in terms of filing for patents, marketing you research, seeking funding and partnership with private and public sectors, and so on. However, David can only shared scarce success stories. What is more important here is that in making real impact, all parties need to play a part.

*...in making real impact,
all parties need to play a
part.*

UBD is also focusing more on applied and interdisciplinary researches in certain areas due to its limited capacity. However, given that the university is still young and developing, there are still many potentials left to be uncovered.

So the end message David left was:

"Come and join us. Because you can help!"

SUMMARY OF PANEL DISCUSSIONS

Topic: Globalising Brunei: Where are we in this interconnected world?

In line with the theme “Enhancing Research Prowess” and continuing on Mr David Koh’s point on the importance of global research activities in UBD, the topic for the panel discussion seeks to understand Brunei’s current position in the world. The main discussion is on how to project Brunei in the global arena.

Allen Lai, Director of Asia Inc Corp., reminded that **Brunei is not new in the globalised world**. First, Brunei has already a long history of being active in the global world. For example, Ferdinand Magellan visited Brunei in 1521, as well as numerous trade with others in the region for the past centuries and so on. Second, Brunei in its current state is highly integrated and interconnected in the global economy. Brunei is part Asia-Pacific Economic Cooperation (APEC) and Association of Southeast Asean Nation. It is also one of the founding members of the Trans-Pacific Partnership (TPP), a significant platform for trade in the Asia pacific. Even the Brunei passport allows entering many countries without the need to apply visa. So the Ministry of Foreign Affairs and Trade is doing a tremendously excellent job.

The question then is: how do you capitalise on that? How can the Brunei business community capitalise on these opportunities and diversify from the oil and gas industry? How can we encourage SMEs to do business in the current globalised world? That's the main challenge.

The answer lies in individuals and the value that they can create, which Javed Ahmad, Managing Director of Fajr Capital, emphasised throughout the discussion. And rightfully so. It all boils down to individual potentials in creating real values for them and for their country. This is especially true to scholarship recipients studying abroad. Possessing vast knowledge and experience resulted from exposure to other thoughts, traditions and cultures is the key for transformation and creating values, be it in business, research, medical, and so on, which then feeds on contributing to the well-being of the society.

It all boils down to individual potentials in creating real values for them and for their country.

The history of Fajr Capital and Brunei’s involvement provide a good example. “It all started with a dream”, said Javed. Back then before Fajr Capital started, the OIC markets have not benefited much from the advancement of financial institutions. Many were dissatisfied with the current going of the financial world mainly because they were not seeing real impact that is wanted within OIC countries. So they quit their jobs from big institution to start Fajr Capital, and Brunei was one of the catalyst to make the dream a reality. After one and a half years, they managed to raise \$700m dollars. Not a small amount. Suddenly, Brunei Investment Agency, other banks in Brunei, as well as other financial institutions from Malaysia and Saudi have become strategic investors. At this stage, they have established a shared vision of creating a vibrant economy within the OIC countries.

Since then, Brunei has benefited well from investing in the company because more opportunities are pouring into Brunei compared to the investment Brunei has given. Bank Islam Brunei Darussalam was amongst the first to benefit. However, not many OIC countries have accommodating policies for investment like Brunei do. Truly

Brunei provides the right environment for development. There is absolutely no excuse for Brunei not to develop. Even in the face of crisis, there will always be opportunities to be grabbed. "We can't say that there's nothing that we can do," exclaimed Javed. By the end of the day, **we all need to think how to bring benefit back to Brunei for the investment that Brunei has made.** The most evident is to bring back all the "know-hows" back into developing the country, bringing better opportunities.

Allen added that "...it has to be **about focus.** We can't do business everywhere. We can't do business in all industries. We are a small country, we should look at our strength, we should focus on those, and we should work with the government and the private sector to identify what that strengths are, and how we can use the platform like TPP and APEC to go out into the globalised world."

The Q&A session then opens up with Ayyub Kamaluddin from Imperial College London regarding the movement of people with relations to patriotism. One of the issues now is that some scholarship holders are not returning to Brunei in pursuit for other opportunities. Javed mentioned that this a key discussion for APEC and ASEAN too, not only Brunei. But again, by the day, its about return on investment that Brunei has made. The return may or may not be in the form of physically present in Brunei, but can be elsewhere. Both Javed and Allen mentioned that they have been out of the country for some time, but is actively directing attention towards Brunei whenever possible. Such is the nature of work in this technologically advanced globalised world.

It is also possible to be excelling in one's field and require being outside of Brunei longer to do ground-breaking work. From investors' point of view, this is positive news and would encourage doing so. Allen agrees with the fact that there are plenty on Bruneians excelling in their respective field. However, one of the obstacles they face when going back is the lack of opportunities suitable for these highly-skilled Bruneians. They grapple with "How can I go back to Brunei and contribute to nation-building?" There is a clear need for dialogue among stakeholders so that all can reap maximum benefit from their investments.

Fadli Zaini of the University of Essex enquired on the readiness of Brunei's financial institution to play a part in the ASEAN economy. Javed replied that Brunei's bank, such as BIBD and Baiduri are very strong and are rated very high in the ASEAN regions, along with Singaporean banks. However, the challenge is not the readiness of financial institutions but providing the right solutions to various markets in the region. The region is not monolithic. Opportunities to expand are there once the right solutions are identified, because in essence, businesses are provider of solutions.

Fadli also directed a question to Allen regarding developmental focus for individuals. "Can Bruneians do it? Can Brunei go where other countries go? Yes, we can!", exclaimed Allen. There are numerous Bruneians who have done well in their respective field, so there is no real excuse to not go far. The journey – any journey as a matter of fact – is not easy. He continued, "In terms of what you should focus on, you should focus on being hungry." The sense of hunger and ambition is what is lacking in many. This can be achieved by enjoying our work, and doing them really well. "Push ourselves!"

*"You should focus on being hungry."
– Allen Lai*

The discussion concluded with a renewed sense of "hunger" which energise Brunei to be more active in the global world.

EVENT REPORT

The event was successfully carried out on March 19th, 2016, at the Royal School of Mines, Imperial College London, in collaboration with Imperial College Union Bruneian Society.

The guest of honour for the event was Major General (Rtd) Dato Paduka Seri Haji Aminuddin Ihsan bin Pehin Orang Kaya Saiful Mulok Dato Seri Paduka Haji Abidin, Brunei Darussalam High Commissioner to the United Kingdom and Northern Ireland. A total of **65 students** attended the event, including presenters (22) and executive committee members (8). Invited officials (20) from the Brunei Darussalam High Commission, Brunei Students' Unit, the Brunei Investment Agency in London and ASEAN representatives (2) were also present during the event.

The morning session consisted of a keynote speech, panel discussion and two highlight student presentations. Seven poster presentations of students were also showcased on the day. The afternoon session was followed by 16 student presentations, which were divided into two panels (panel A and B).

The keynote speech was given by Chair Professor David Koh, Assistant Vice-Chancellor (Research and Innovation) of University Brunei Darussalam (UBD) on 'Research Climate in Brunei'. The panel discussion on 'Globalising Brunei: Where are we in this interconnected world?' were participated by Mr Javed Ahmed, Managing Director of Fajr Capital and Mr Allen Lai, Director of Asia Inc Forum.

The two highlight speakers were Md Sabri bin Md Ali from the University of Oxford, who presented on 'Control of Chloroplast Development and Its Potential Application in Agriculture', and Abdul Mu'izz bin Abdul Khalid of University College London who presented on 'The development of Brunei into becoming a Zikir Nation'. Two best presenters (panel A and B) and best posters were awarded on the day. The winners were Ayyub Kamaludin of Imperial College London, Khairunnisa Ibrahim of University of Oxford and Madihah Harun of University of Reading respectively. All presenters were given certificate of participation and all attendees were given certificate of attendance.

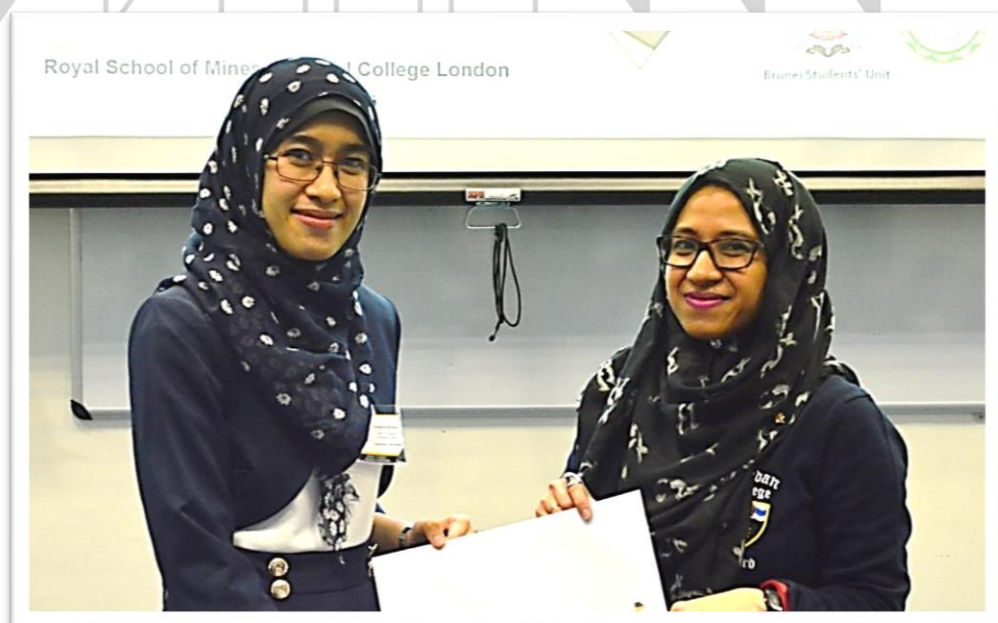


Photo: Chair of BSRS 2016, Amalina, is giving one of the winning presenter, Khairunnisa Ibrahim, her certificate of participation

EVENT OUTCOME

Overall, the event was successful. A great turnout of students (undergraduates and postgraduates) and they were actively involved in the Q&A sessions. A feedback form was also given to attendees on the day of event. The attendees felt that the symposium fulfilled their reason to attend the symposium and they were overall satisfied with the symposium (symposium content, networking, registration process, venue and refreshments).

Some of the suggestions given for the improvements of symposium were more advertising, inviting more guests from various fields, better time management and mixed area of talks in panels for more balanced turnout. The attendees also suggested for more activities to be organised by the Brunei postgraduate society; which includes more symposiums, debates and networking events.



Photo: The High Commissioner of Brunei Darussalam to the United Kingdom and Northern Ireland Major General (Rtd) Dato Paduka Seri Haji Aminuddin Ihsan bin Pehin Orang Kaya Saiful Mulok Dato Seri Paduka Haji Abidin, taking part in the discussion on the topic “The ASEAN Way: Can It Stand the Test of Time?” by Saifuddin Pg Dp Hj Sallehudin from University of Warwick

PARTICIPANTS' FEEDBACKS

The following feedbacks are based on 21 responses received from attendees:

1. Please specify the **main reason for attending** the symposium
 - **To listen to students' presentation** (85.7%)
 - **Personal growth and development** (71.4%)
 - Networking (47.6%)
 - To listen to the keynote speaker (42.9%)
 - To attend the panel session (33.3%)
 - Other (14.3%)
2. Did the symposium fulfil your reason for attending?
 - **Yes** (90.5%)
 - Somewhat (9.5%)
 - No (0%)
3. Overall satisfaction with this conference: (5 = very satisfied to 1 = very dissatisfied)
 - **Symposium content** ~ 4.33/5
 - Networking opportunities ~ 3.57/5
 - **Registration process** ~ 4.57/5
 - **Venue** ~ 4.52/5
 - **Food & beverages** ~ 4.05/5
4. Any suggestions for improvements of the symposium:
 - Overall symposium content is satisfying but I feel presenters that read from their text or slides, with too much words are disturbing. Maybe committee will look on this matter. A more proper prayer room and ablution room. Time management should be observed too. By seeing your progress on this 3rd symposium, I think next year you could afford addition of another 30% of participations.
 - Perhaps advertising to attract more students to come
 - Keep inviting UBD to BSRS
 - Foreigner expert on particular field maybe included
 - More space in between posters
 - Locality awareness of the event (I found out through a relative), and the benefits of attending it (it may not be obvious to some)
 - More research done by undergraduate students
5. For future reference, which topic/area would you like to listen to?
 - Human rights and applied mathematics
 - Post-oil economy
 - More social science especially studies on Bruneian culture, social issues etc.
 - Medicine areas - technology about intervention
 - Sustainability such as environment, food self sufficiency, protection and vice versa
 - Psychology criminology geography etc.
 - Business, management, entrepreneurship, innovation
 - Humanities, social science, science that is more relatable to people that don't study the field
 - Diversity/ecology/environmental biology
 - There were good amount of areas I'm interested that are covered

6. For future reference, what activities would you like to see run by the Brunei Postgraduate society?
- Debate panel
 - Talk by the top one person in particular field
 - A methods workshop; visits to certain universities
 - More symposium or conference
 - General knowledge quiz; Debates
 - Annual dinner to provide a platform for students, to share each others knowledge informally and in a more open/casual set up
 - Less formal ideas/networking events? Meetups, hangouts with emphasis on research showing?
 - Activities that can help undergraduates to increase their career prospects and choices
 - Activities that could break stigma of mental health in Brunei
 - One hr presentation on outstanding Brunei scholars which give a big impact on Brunei's development. Other than their publications and awards achieved, but also on volunteer works or community service throughout the UK
7. Would you volunteer for any future activities run by Brunei Postgraduate Society?
- **Yes** (66.7%)
 - **Maybe** (33.3%)
 - **No** (0%)



Photo (Left): Post-symposium dinner with participants at Brunei House, London.

Photo (below): Bruneian and Malaysian PhD students from Oxford in attendance



PRESENTATION ABSTRACTS

STUDENT PRESENTATION #1

Control of chloroplast development and its potential application in agriculture

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Plants use energy from sunlight to make food in structures known as chloroplasts. Chloroplasts are oval in shape and green in colour when viewed under a microscope. The contents of a chloroplast are separated from the surrounding environment by a barrier that restricts the movement of materials in and out. Thus, chloroplast evolved channels that function like gates dedicated to controlling the movement of raw materials, important for chloroplast development and function. A defect in one of these channels (which normally enables uptake of protein building blocks) has a negative impact on the plant, causing them to appear unhealthy (i.e. small in size and pale green in colour).

It was discovered that an enzyme, called SP1, could regulate the activity of this channel by controlling its abundance at different developmental stages and state of environment. Two relatives of SP1 also exist but are unknown in function. Therefore, I am investigating their roles and involvement in chloroplast development. I am also trying to identify new factors that are important for maintaining the plant in a healthy state.

STUDENT PRESENTATION #2

The Forgotten Reformation: A critical study of the vision to transform Brunei Darussalam into becoming a 'Dhikr Nation'

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This research will concentrate Brunei Darussalam through a critical lens. It involves with the Bruneian Muslim praxis facing the contemporary challenges in the globalised world. Brunei aims to materialise the vision of becoming 'Dhikr Nation'. However, the vision is not going to materialise completely with the current system that is happening in Brunei, where it is missing one fundamental ingredient – the forgotten reformation. The forgotten reformation was inspired by Professor Tariq Ramadan's book, 'Radical Reform' where there needs to be a radical reformation with the Bruneian mind-sets and hearts. There is a lack of intrinsic elements of Islam in Brunei that is forgotten, especially through the education system, which hinders the path for Brunei to transform into a 'Dhikr Nation'. This can be reinforced with a Qur'anic verse where Allah SWT says "Indeed, Allah will not change the condition of a people until they change what is in themselves" [13:11]. Therefore, this research will explore this phenomenon in greater detail, where it will be conducted with a qualitative methodology, specifically with critical interpretivist methods, ethnographic semi-structured interview and discourse analysis.

PANEL A

Public opinion on renal transplantation

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Brunei Darussalam is a small Muslim country with a high prevalence and incidence of kidney disease. At present, there is no local transplant program for patients on the renal replacement therapy program. In order to assess feasibility of a local transplant program, we decided to conduct a survey to assess public opinion on renal transplantation. The majority of the 300 respondents (78.7%) were willing to donate their kidneys if needed. Even after learning of the small theoretical risks of kidney failure, 72.33% of all respondents were still willing to proceed with transplantation. Respondents who had relatives on dialysis and who had a higher education level were more willing to donate their kidneys. There was no significant difference between Muslims and non-Muslims. Most respondents (59.7%) preferred to have transplantation done locally. This study shows that most Bruneians are receptive of the idea of living related kidney donations, which augurs well for the sustainability of a new program. More work is needed to overcome other barriers like the availability of surgical expertise and facilities and cost-benefit considerations.

Predicting The Effect of Extensive Neuro-rehabilitation in Post Stroke Patients

UMMI SALWA SUHAIMEI

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Stroke is the second common cause of morbidity and mortality worldwide. The WHO evaluated 15 million individuals endure a stroke every year and of these 5 million die and another 5 million are left permanently disabled. In Brunei, stroke is the fourth driving reasons for death.

Fortunately, over the years, with increasing availability and developments of treatment for patients, for instance, the foundation of the Brunei Neuroscience Stroke and Rehabilitation Centre (BNSRC), this has resulted in a greater chance of survival for affected individuals. Nevertheless, the residual impact still remains devastating.

Inevitably, this leads to an increase in demand for efficient stroke care. Hence, calling for more knowledge to continuously find new and improved therapies to assist in reducing the impact of different types of impairments that may arise in post-stroke patients.

My research talks about the nature of improvement of impaired motor function after stroke. Due to its impact on the quality of life, we have decided to focus on the impairments of the upper limbs. By using a set of outcome measures and correlating the results with the baseline characteristics of each patient, we aim to predict the effect of extensive neurorehabilitation on post stroke patients.

Are CRISPR/Cas systems ready for genome editing in humans?

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The recent discovery of the CRISPR/Cas systems and their role in programmable genome editing are revolutionising biology. Never before has genome editing been this accessible and easy-to-use. However, their use in vivo will require overcoming issues of delivery, specificity, and immunogenicity. This literature project will explore these issues in the light of current advances, as well as the implications this powerful tool brings to the table.

CXCL12 Induced Migration Relies On Specific Signalling Cascades in Different Cell Lines

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Tumor metastasis is the major cause of death in cancer patients who have suffered a primary solid tumor and recent evidences have shown that chemotactic signalling plays a crucial role in tumor invasion and spreading. Protein Kinase C (PKC) has been shown to have central roles in signalling in response to many extracellular ligands, and can influence many aspects of cell behavior. Activation of PKC is one of the earliest events in the cascade of signal transduction pathways leading to variety of cellular response. Our aim is to investigate the molecular mechanisms of CXCL12 induced cell migration, and the importance of PKC activation in this system by chemotaxis assays in Jurkat cells and scratch assays in MCF-7 cells after treatment with various PKC inhibitors. We have shown that PKC activation is vital for cell migration in breast cancer cells, but not in leukemic cells, by using 5 μM GF109203X and 10 nM Staurosporine (non-selective PKC inhibitors), 4 μM Rottlerin (previously known as PKC δ inhibitor) and 11 μM CID755673 (PKD inhibitor). Our study has shown that PKC is essential in different signalling cascades and that the cellular background is important for the distinct signalling pathways used by CXCR4 receptors.



Photo: Poh Hui Goh, one of the presenters of Panel A, receiving her certificate of appreciation from the Chair, Amalina

PANEL B

Police liability and immunity

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This paper aims to examine whether and to what extent the notion of immunity in this area should be upheld, particularly in the application of the law governing police negligence. This paper examines the appropriate tests in determining the existence and scope of the duties, which arise from the police as well as the policy grounds underlying courts' decisions. With specific reference to case laws, and certain specific landmark cases, it will be assessed how consistent (or otherwise) courts have been in application of immunity in event of police negligence. The motives behind adoption of courts' attitudes will also be analysed in concluding whether there exists legitimate reasoning behind the granting of immunity.

It is important to realize that the exact scope and boundary when applying immunity is one, which was (and arguably is) hard to define. This is due to the fact that each case ought to be looked at, based on the facts of the case and there exists no hard and fast rule, which is applicable to all scenarios. There have been efforts by the courts in defining and decreasing confusion in this area of law and it will be explored in this paper.

Death of Coral Reefs in Changing Climate? May the Legal and Non-Legal Force be with the Tropical Islands' States

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This on-going research paper will explore first, the international and some of the tropical islands' states legal regimes toward protecting coral reefs and second, how the success of the recent Paris Agreement on Climate Change is very important in ensuring that such tropical reefs have the greatest resilience in the face of changing climate. Two climate change induced effect on these reefs will be considered: coral bleaching and the declining calcification rate of corals. With regards to the first part, this paper submits that while such regimes give direct and/or indirect protection to coral reefs, they are not sufficient. Similarly, and albeit what has been termed as by far the most important international agreement in history, the Paris Agreement's Nationally Determined Contributions of Parties with regards to emissions target will not be binding. Consequently, this undermines the rights of the most vulnerable communities, the small islands' states. This paper concludes by acknowledging the importance and thus the need for strong cooperation mechanisms by any states in the management and conservation of coral reefs, such as that of the Coral Triangle Initiative in order for there to be a future, hopefully, for coral reefs and ultimately, us.

The ASEAN Way: Can It Stand the Test of Time?

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ASEAN was formed in the tumultuous period of 1967 under the backdrop of the cold war and rampant regional strife. During that era, the main priorities of the ASEAN states were the protection of their sovereignty, and the assurance of domestic stability; both of which stems from their bitter experience with colonialism, and the imperatives of nation-building that comes with independence. Under that context, ASEAN needed a framework that allowed the nations to cooperate together while still guarding their autonomy. This was the raison d'être of

the 'ASEAN Way'. Through the process of consensus and consultation, with a dogma of non-interference and non-use of force, alongside an emphasis on quiet diplomacy, the 'ASEAN Way' provided the ability for the nations to work together in harmony, while safeguarding their rule. However 40 years on, the organisation is faced with new challenges, of which include transnational issues, non-traditional security concerns, and how to move forward with the association. This brings up an important question, can the 'ASEAN Way' stand the test of time, or must the framework be altered into something different? Or perhaps, within the same auspices, we can evolve it into something even more.

Across the Zooniverse: A technofeminist analysis of online citizen science

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Gender inequality in institutional science is a well-established fact, but much less is known about women's engagement in informal, open forms of scientific research. My thesis studies how gender relations play out on, affect and are affected by the online citizen science platform, the Zooniverse. In citizen science projects, volunteers contribute time and energy to help scientists with data collection, processing and analysis. Requiring only computer and internet connection, these projects are potentially more accessible and inclusive than institutional science. Quantitative analysis shows women volunteers are still underrepresented and display preferences that mirror the distribution of women scientists across scientific fields. While the Zooniverse markets itself as enabling research for everybody, discourse and content analyses reveal that women are marginalised and undervalued in online citizen science. Using a technofeminist approach that theorises gender and technology as mutually constitutive, my thesis brings to the forefront the myriad ways that gender inequality is produced and reproduced in scientific knowledge production, as a first step towards awareness and action to narrow the gender gap in science.

PANEL C

Electrochemical and Spectroscopic studies of Greigite for CO₂ reduction

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Catalytic roles of minerals have been cited in a number of origins of life models. Iron sulfide minerals in particular have been proposed to play roles in the Iron-Sulfur World and Iron-Sulfide Membrane theories. They are proposed to reduce carbon dioxide, producing small molecule products which may be the first organic building blocks on Earth. The similarity in structure and property of iron sulfide minerals to protein and enzymes such as ferredoxins and CO-dehydrogenase also suggest that they may have the potential to perform the same chemistry.

Synthetic iron sulfide greigite, Fe₃S₄, used in this study is able to reduce CO₂ into chemicals such as methanol, acetic and formic acid under ambient conditions on application of a small potential.

In-situ electrochemistry and ATR-FTIR (Attenuated total reflectance - fourier transformed infrared) spectroscopy were employed to understand the CO₂ reduction pathway on greigite. X-ray absorption spectroscopy (XAS) technique and computational modelling have been carried out to provide support to conclusions obtained from ATR-FTIR. Sulphur cycling and preferential binding of CO₂ at pH 7 were observed in ATR-FTIR. XAS revealed the dominance of sulphur chemistry over iron chemistry. Computational calculations predicted the preferential binding of CO₂ to occur at pH 7.

Organic Electronics: Do contaminants degrade or enhance performance?

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Flexible and disposable electrical devices can be realised through utilising carbon-based (i.e. organic) semiconducting materials. One such material, single-crystal rubrene (SCR), has been found to display relatively high charge-carrier mobilities when used in field-effect transistor devices. However, chemical mapping and photoluminescence (PL) studies on SCR indicate the presence of oxygen-related contamination that can result from photo-oxidation simply from exposure to ambient light and air conditions. The role of such contamination on electrical performance will be studied by carrying out measurements on freshly produced and intentionally oxidised SCR. To achieve this, we have built a two-zone furnace to grow SCR using the 'physical vapour transport' method, defined PL as a characterisation method for checking crystal quality, and are currently developing a method to precisely print micron-sized electrical contacts on SCR which can be performed at room conditions.

Environmental stress cracking of thermo-plastics: a fracture mechanics approach

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Under the combined influence of an aggressive environment and an applied stress, engineering thermoplastics are known to undergo a phenomenon known as environmental stress cracking (ESC). This can result in adverse effects, such as embrittlement and premature failure in service due to cracks growing to critical sizes, while little fluid absorption seen in the bulk material. Fracture mechanics is considered as a suitable scheme to study and quantify ESC, with the aim to obtain characterising data for polymer-fluid combinations of interest, as well as developing a reliable fracture mechanics-based ESC test protocol. In the proposed method, slow crack growth is monitored to assess the effect of a range of applied crack driving forces (K , or alternatively G) on observed crack speeds, as opposed to simply measuring time-to-failure. A discussion of the various issues surrounding the data analysis for these long-term tests is also included, as the attainment of consistent and repeatable results is critical for the method to be internationally standardised.

Electrical Properties of Doped and Undoped Haematite, α -Fe₂O₃

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Haematite has been an interest for the use in photoelectrochemical cell (PEC) system. Within a PEC system, haematite has been used as a photoanode to split water into hydrogen and oxygen; upon which the hydrogen will be used as fuel. This study undergoes an investigation into the electrical properties of an iron oxide material, haematite (chemically known as α -Fe₂O₃). Specifically, studies will be done on the structure of haematite and attempt to relate it with its electrical properties. This will be done on pure, doped and oxygen nonstoichiometric haematite samples made through conventional solid-states route. Characterization through x-ray diffraction, thermogravimetric analysis and SEM imaging will be done to confirm its composition, its crystal structure and its microscopic appearance. Whereas the characterisation of haematite's electrical properties will be done through impedance spectroscopy, whereupon quantitative analysis can be made to calculate activation energies. Additionally, qualitative analyses will also be done to deduce an equivalent resistor-capacitor (RC) circuit to account for haematite's electrical structure. There is a lack in literature findings that fundamentally underpins haematite's electrical structure, as most studies done involved haematite used as photoanodes. This study will attempt to experimentally investigate and catalogue electrical properties of different haematite specimens.

PANEL D

Wisdom to bridge sciences

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This conceptual section of my thesis presents a discussion on ontology and epistemology to understand the dichotomy of science in natural/pure and social. I argued that this dichotomy is less useful for praxis. Rather than presenting the two separately, I will attempt to connect them by employing Aristotle's work, Islam's hierarchy of knowledge as well as critical realist's ontological discussion. Aristotle brings in the understanding of 5 intellectual virtues to possess truth: sophia (philosophic wisdom), phronesis (practical wisdom), episteme (scientific knowledge), techne (art) and nous (intuitive understanding). Natural science here is not seen as the highest form of knowledge. However, all these intellectual virtues need to work together for a common purpose. The Islamic intellectual tradition harmonises these virtues in a hierarchy of knowledge with a clear goal to save mankind from their "wretched state of the lowest of the low and enable to regain the angelic and paradisaic state in which he was originally created" (Nasr, 2006, p. 37). Critical realism, as well as its over-arching philosophy of metaReality conceived by Roy Bhaskar, brings in contemporary philosophy into the discussion. It is hoped that the illusory divide between sciences dissipate. Practical implications are presented as demonstration.

Exploring the role of globalization as an agent of development

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This research project will explore the notion of globalization as an agent of development. This will be done mostly through analyzing inequalities and poverty that has been perpetuated through a globalization process referred to as global value chain. This will be discussed more specifically on the topic of coffee supply chains that have often been linked to concepts such as outsourcing and informalities. A qualitative method of content analysis is to be adopted in this study in order to collect primary data of the research, whilst secondary data will be gathered through the use of questionnaires. This research project hopes to use these data to provide a platform for raising awareness in ensuring a mindful and cooperative business standard especially with the increasing number of coffee shops in Brunei Darussalam. This is particularly valuable for Brunei Darussalam in its advancement and effort to merge its nation's philosophy, Melayu Islam Beraja (MIB) with international standards in relation to its business relations.

Petrocultures in Asia: Towards a better dissemination of narratives on oil

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The field of Petrocultures found its roots in the last twenty years in an essay written by Amitav Ghosh, on post-oil anxieties in Arabic literary texts. The focus of the field is often on the absence, rather than significance, of oil, reflecting contemporary anxieties of a world in which oil is no longer a viable commodity. The purpose of this paper is to determine a transferrable theory from the field of Petrocultures and its focus on American, Canadian, and Middle Eastern literary texts, in establishing a narrative strategy for oil literacy in Southeast Asia (with particular focus on Brunei). This will be done by using comparative literary studies to discern patterns from established texts in the field - for example, critical analyses of Cormac McCarthy's *The Road* (USA), Abdelrahman Munif's *Cities of Salt* (Saudi Arabia), and Ken Saro-Wiwa's *A Month and A Day* (Nigeria). The paper's main finding

will centre around establishing potential directions for the field to flourish in Brunei, and the overarching aim of this study is in suggesting modes of talking about oil in Brunei - whether through literary fiction, visual media, or academically curated narratives.

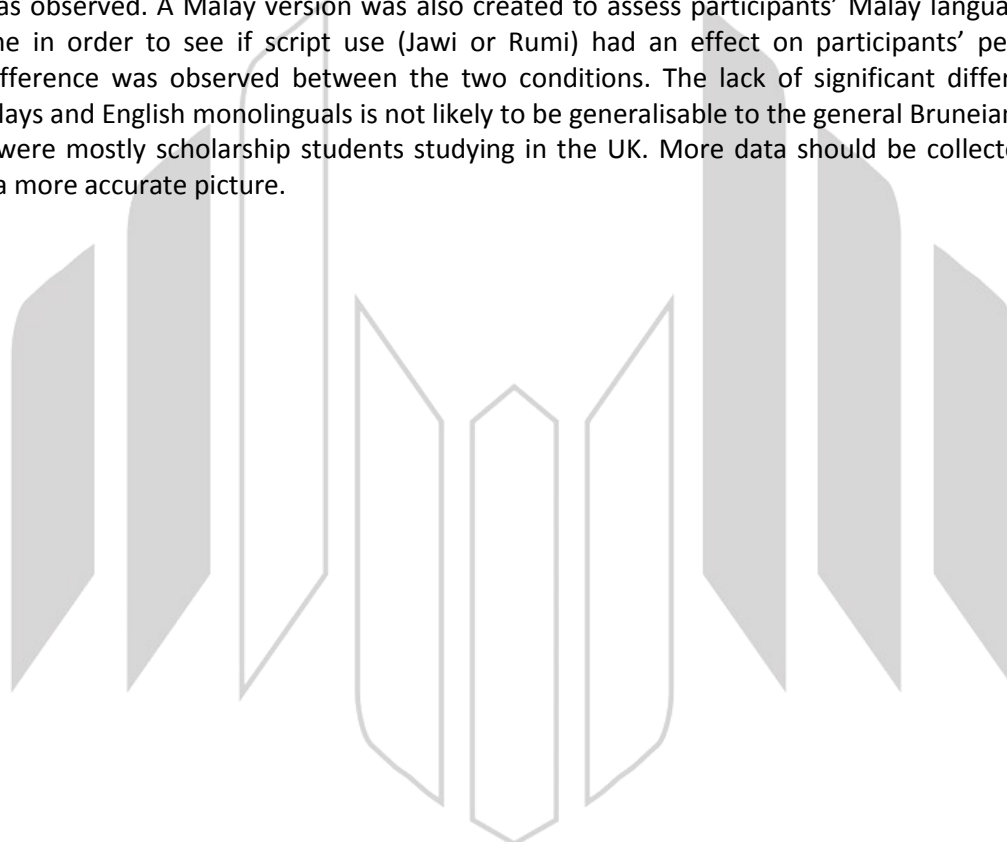
Assessing Bruneian Malays' language proficiency in language psychology research

MOHAMMAD FARHAN BIN MURNI

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To complement data collected in language psychology experiments assessing participants' language proficiency is key, one method of doing so is to administer a lexical test. In a study investigating the Stroop effect in Bruneian Malays, the Lexical Test or Advanced Learners of English (LexTALE) was used to assess participants' English language proficiency, their performance was compared with English monolinguals and no significant difference was observed. A Malay version was also created to assess participants' Malay language proficiency; this was done in order to see if script use (Jawi or Rumi) had an effect on participants' performance. No significant difference was observed between the two conditions. The lack of significant difference between Bruneian Malays and English monolinguals is not likely to be generalisable to the general Bruneian population as participants were mostly scholarship students studying in the UK. More data should be collected in Brunei in order to get a more accurate picture.



POSTER ABSTRACTS

Increasing Cognitive Load Reduces Interference from Masked Appetitive and Aversive but Not Neutral Stimuli: Replication and Extension

Madiah Harun

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We are constantly exposed to distracting information in our daily lives that can affect our behaviour without our conscious knowledge. Uher, Brooks, Bartholdy, Tchanturia and Campbell (2014) asked participants to complete easy and difficult versions of a verbal working memory (WM) task while briefly presented with masked emotional stimuli (aversive, appetitive and neutral). They found that emotional distractors had a significant impact on verbal WM performance, even when participants were unaware of the distractors. However, Uher et al. (2014) only examined verbal WM. Evidence from psychology and neuroscience suggests that there are separate WM systems processing verbal and spatial information and that spatial memory is affected more by emotional distractors than verbal WM. In this study, we replicated and extended the study by Uher et al. by exploring how emotional distractors may affect spatial WM. We modified the original verbal WM task by using the locations of red stars on a computer screen as a target. We hypothesised that performance in spatial N-back task will be affected more compare to verbal N-back task, particularly with aversive and appetitive stimuli. 135 participants completed both types of N-back task and we will compare the effect of emotional distractors on both task performances.

Investigating mechanisms of resistance to the Hsp90 inhibitor in triple negative breast cancer

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Triple negative breast cancer (TNBC), which accounts for 10-17 % of all breast cancers, is challenging to treat as there is still no approved targeted therapeutics. Cancer develops from an uncontrolled cell growth driven by signals from various proteins. A molecular chaperone (Hsp90) that regulates the maturation of proteins has become an interesting molecular target for the development of novel cancer therapeutics. Ganetespib, a Hsp90 inhibitor, has shown promising anti-cancer activity in TNBC patients. However, not all patients respond to the treatment and they develop resistance. In this project, we generated a model of TNBC cells to investigate the mechanisms of resistance to ganetespib and used several experimental techniques, including next generation RNA-Sequencing and multi-drug screening. A greater understanding of Hsp90 inhibitor activity may help in developing effective therapeutic strategies and identifying new drug combinations in TNBC patients.

Cloning and functional characterisation of a P2Y11 receptor orthologue in *Danio rerio*

Muhammad Zikri Rifa'ie Haji Zulkifli

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The purinergic receptor P2Y11 has many functions in the human body. It is also the only known G-protein coupled receptor (GPCR) to undergo intergenic splicing and cotranscription with an upstream gene SSF1, producing an ubiquitously present and regulated chimeric protein in humans. However, different ligand binding preferences were seen between human P2Y11 and its canine orthologue. To establish the P2Y11 ligand affinity of the possible animal model zebrafish (*Danio rerio*), we sought to express its gene in the human cell line 1321N1, which will then be screened with a FLIPR system-based calcium signalling assay to detect GPCR activation in response to ATP, ADP and benzoyl-ATP. Results will determine the ligand binding preference of

zebrafish P2Y11 among these nucleotide molecules. To detect the presence of intergenic splicing in zebrafish P2Y11, RNA from zebrafish embryos will be amplified with a 5' Rapid Amplification of cDNA Ends procedure using a single primer coupled to P2Y11 mRNA. The amplified cDNA will be sequenced to detect the SSF1 gene. The presence of the characteristic SSF1-P2Y11 sequence will elucidate the occurrence of intergenic splicing in zebrafish P2Y11. Overall the results will determine the similarity in function and expression between human and zebrafish P2Y11.

CXCL12 Induced Migration Relies On Specific Signalling Cascades In Different Cell Lines

Poh Hui Goh

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Tumor metastasis is the major cause of death in cancer patients who have suffered a primary solid tumor and recent evidences have shown that chemotactic signalling plays a crucial role in tumor invasion and spreading. Protein Kinase C (PKC) has been shown to have central roles in signalling in response to many extracellular ligands, and can influence many aspects of cell behavior. Activation of PKC is one of the earliest events in the cascade of signal transduction pathways leading to variety of cellular response. Our aim is to investigate the molecular mechanisms of CXCL12 induced cell migration, and the importance of PKC activation in this system by chemotaxis assays in Jurkat cells and scratch assays in MCF-7 cells after treatment with various PKC inhibitors. We have shown that PKC activation is vital for cell migration in breast cancer cells, but not in leukemic cells, by using 5 μ M GF109203X and 10 nM Staurosporine (non-selective PKC inhibitors), 4 μ M Rottlerin (previously known as PKC δ inhibitor) and 11 μ M CID755673 (PKD inhibitor). Our study has shown that PKC is essential in different signalling cascades and that the cellular background is important for the distinct signalling pathways used by CXCR4 receptors.

The role of autophagy in herpes simplex encephalitis

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Herpes simplex encephalitis (HSE) is a rare yet potentially life threatening disease typically affecting young children and the elderly. Previous studies have identified genetic deficiencies of the TLR3-IFN pathway to predispose to developing HSE. Patients with these genetic deficiencies, including UNC93B1, TLR3, TRIF, TRAF3 and TBK1 share the inability to produce protective IFNs in response to HSV1 infection and double stranded RNA. A number of these genes have also been implicated in the induction of autophagy, an evolutionarily conserved cellular process that has recently been implicated in viral immunity. Furthermore, HSV1 had been shown to harbour virulence proteins to antagonize autophagy. Herein, the particular role of autophagy in the recently described HSE genetic deficient patients' cells is investigated.

Electrochemical and Spectroscopic studies of Greigite for CO2 reduction

Siti Nurul Azian Zakaria

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Catalytic roles of minerals have been cited in a number of origins of life models. Iron sulfide minerals in particular have been proposed to play roles in the Iron-Sulfur World and Iron-Sulfide Membrane theories. They are proposed to reduce carbon dioxide, producing small molecule products which may be the first organic building blocks on Earth. The similarity in structure and property of iron sulfide minerals to protein and enzymes

such as ferredoxins and CO-dehydrogenase also suggest that they may have the potential to perform the same chemistry.

Synthetic iron sulfide greigite, Fe₃S₄, used in this study is able to reduce CO₂ into chemicals such as methanol, acetic and formic acid under ambient conditions on application of a small potential.

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AQILAH@SYAFINA ABD HADZID
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Predicting The Effect of Extensive Neuro-rehabilitation in Post Stroke Patients

UMMI SALWA SUHAIMEI
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Stroke is the second common cause of morbidity and mortality worldwide. The WHO evaluated 15 million individuals endure a stroke every year and of these 5 million die and another 5 million are left permanently disabled. In Brunei, stroke is the fourth driving reasons for death.

Fortunately, over the years, with increasing availability and developments of treatment for patients, for instance, the foundation of the Brunei Neuroscience Stroke and Rehabilitation Centre (BNSRC), this has resulted in a greater chance of survival for affected individuals. Nevertheless, the residual impact still remains devastating.

Inevitably, this leads to an increase in demand for efficient stroke care. Hence, calling for more knowledge to continuously find new and improved therapies to assist in reducing the impact of different types of impairments that may arise in post-stroke patients.

My research talks about the nature of improvement of impaired motor function after stroke. Due to its impact on the quality of life, we have decided to focus on the impairments of the upper limbs. By using a set of outcome measures and correlating the results with the baseline characteristics of each patient, we aim to predict the effect of extensive neurorehabilitation on post stroke patients.



Group photo: Student presenters with the current Director of Studies from Brunei Students' Unit, Cikgu Ahmad Faisal bin Haji Zainal Abidin

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