

JANUARY 2022 | Q1

PGSC NEWSLETTER



An update of all postgraduate activities in the *School of Chemical & Biomolecular Engineering*



WHO ARE WE?



L-R: Pradeep Murthy (*President*),
Yanxi Yu & Wenjie Yang (*Vice-Presidents*),
Zexin Lei (*Secretary*), and
Hashim Jalil Khan (*Treasurer*)

We are a group of highly technical and devoted Chemical Engineering PhD students at USYD.

We organise various professional and social events to benefit the CBE research student cohort.

Our goal is to improve both the culture and development of the CBE students heavily interested in research.

CONTACT US

 **CBEPGSC@SYDNEY.EDU.AU**

 **@CBEUSYD**



**SCHOOL OF CHEMICAL AND
BIOMOLECULAR
ENGINEERING UNIVERSITY OF
SYDNEY**



CBE AT UNIVERSITY OF SYDNEY

SOCIAL EVENTS

END OF YEAR EVENT

11 December

Our end of year event comprised of **a round of bowling and a round of laser tag** at **Zone Bowling** in Top Ryde, followed by **lunch** at **Rashay's** in Darling Harbour.

We were also very lucky to be joined by six students from **UNSW**, namely Deepa Dahal, Keivan Rahimi, Koentadi Hadinoto, Ming Jiang Gan, Vinod Kumar Kannaujiya and Yousof Haghshenas. Always good to meet new people and make new friends!

Congratulations to **Jacopo Giaratta** for reaching the highest score of 164 in bowling and to **Dominic Bui Viet** for reaching the highest score of 10050 in laser tag!

The lunch was also delicious and everyone enjoyed their extensive meal. Hope we can do this again next year!



 THE UNIVERSITY OF SYDNEY | School of Chemical and Biomolecular Engineering

CBE Christmas Event

DECEMBER 11, 2021 | 11 AM
INCLUDING: BOWLING/ LASER TAG, TOP RYDE
LUNCH, CITY



Register here

 PSAC UNSW



SOCIAL EVENTS

TRIVIA NIGHTS

July 22, August 22, September 23, October 28

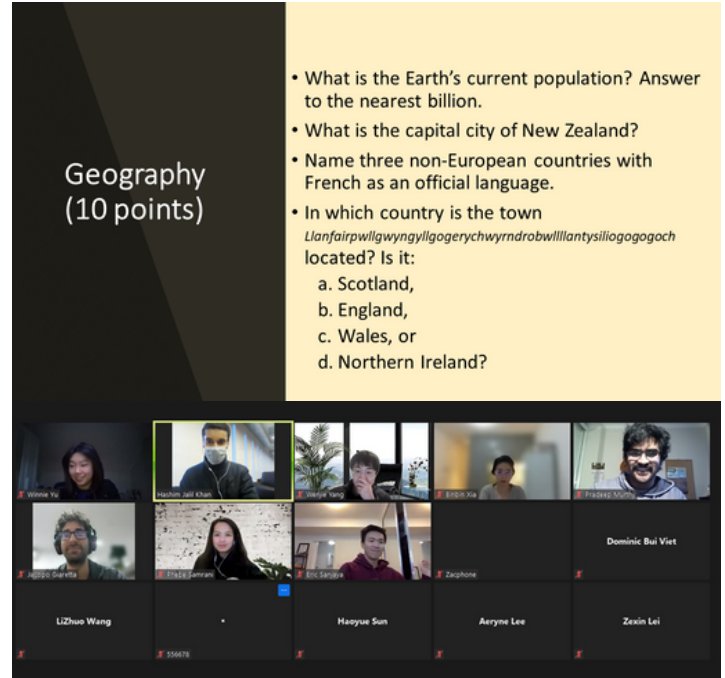
CBE PGSC have hosted four online **trivia** events this year, one via **Kahoot!** and three via **Discord**. Prizes to the winning players/teams were offered in the form of supermarket gift cards, which then changed to **gift cards of their choice**.

Given the nature of the COVID lockdown, these trivia events, especially for the prizes, brought postgraduate and undergraduate students, staff and external friends together for friendly competition.

A sample of the questions are provided to the right. *Why not try them out...?*

Geography (10 points)

- What is the Earth's current population? Answer to the nearest billion.
- What is the capital city of New Zealand?
- Name three non-European countries with French as an official language.
- In which country is the town *Llanfairpwllgwyngyllgogerychwyrndrobwllllantysiliogogoch* located? Is it:
 - a. Scotland,
 - b. England,
 - c. Wales, or
 - d. Northern Ireland?



MOVIE NIGHT

May 14

CBE PGSC hosted a movie night on May 14th in the FTS for CBE students and staff, where we screened **The PhD Movies 1 & 2**, totaling 3 hours (with a break to rest our poor eyes that already stare at a computer screen all day!). We chose this movie from a selection of many well-known movies (besides popular vote...) because it felt like a rather **honest and satirical reflection to our own research experiences**.

Highlights naturally were that the sweet, tasty Cornetto ice creams were finished before any other snack and **Tino** enjoyed the film (especially the second one) far more than anyone else (you can tell by how loudly he was laughing!). Everyone enjoyed the screening very much (but probably more the free food...).



RESEARCH EVENTS

BEST CBE RESEARCH PAPER!

21 December

We are grateful for those who participated in the competition to decide the **best CBE research paper for 2021** and just as much for those who subsequently voted their preferences.

CONGRATULATIONS to the winning paper!

Degradation of cefixime antibiotic in water by atmospheric plasma bubbles: Performance, degradation pathways and toxicity evaluation

by HDR student *Tianqi Zhang*, along with Renwu Zhou, Peiyu Wang, Anne Mai-Prochnow, Robyn McConchie, Wenshao Li, Rusen Zhou, Erik W. Thompson, Kostya (Ken) Ostrikov and Patrick J. Cullen.

An **official presentation ceremony** with a prize to be offered will be conducted in the near future when the COVID situation has sufficiently eased.

THE UNIVERSITY OF SYDNEY | School of Chemical and Biomolecular Engineering

CBE BEST PAPER OF 2021

Nomination: 19th Nov–3rd Dec
Voting period: 6th–15th Dec

NOMINATE HERE

QR code for nomination

Logos: The University of Sydney, PSQC, and a green circular logo with a recycling symbol.

XPS WORKSHOP

October 7, October 21

We hosted a XPS (X-ray photoelectron spectroscopy) seminar and workshop over two separate days, delivered by **Dr. Sarah Kelloway** and **Dr. Ahmed Owais**.

The seminar provided a more detailed understanding of the history, development and theory behind **XPS characterisation**. The workshop displayed and exemplified the use of the Avantage software commonly used for XPS characterisation of materials.

We are very grateful for both Dr. Kelloway's and Dr. Owais' time for delivering the seminar and workshop to help students with furthering their understanding of **material characterisation** for their research.

THE UNIVERSITY OF SYDNEY | PSQC

Introduction seminar

- ☐ Basic theory of XPS, UPS & AES
- ☐ Application
- ☐ Instrumentation overview
- ☐ Sample preparation
- ☐ Analytical considerations

Mini-workshop

- ☐ XPS data analysis overview
- ☐ ThermoFisher Avantage software introduction
- ☐ Online tutorials

QR code for registration

Scan and register here!

XPS, UPS & AES Seminar: Introduction, instrumentation, and sample preparation

2 – 3 pm, October 7
Zoom: 830 1193 7891

Basic XPS Data Analysis Workshop

2 – 3.30 pm, October 21
Zoom: 882 3394 0825

Dr. Sarah Kelloway
Professional Officer, Vibrational Spectroscopy, CaP Laboratory

Dr. Ahmed Owais
Professional Officer

RESEARCH EVENTS

ROBOTICS WORKSHOP

October 7

In a collaboration between CBE and the Australian Centre for Field Robotics (ACFR), a seminar was presented by Chris Jansen (USyd chemical engineering graduate, class of 2010) about physical robotics in automation, given his product development and founding of **CAROL** (Catalyst Removal Amphiro), a robot which can remove used catalysts from a reaction vessel more safely.



Given Chris' broad experience, this seminar was of great interest to understand not only how the industry is evolving, but also how we should **evolve** our thinking with it.

XRD WORKSHOP

August 23

We hosted a 90-minute XRD (X-ray diffraction) workshop delivered by **Dr. Samuel Duyker** from Sydney Analytical, with students and staff also from UNSW attending.

The workshop covered history of powder diffraction, basic principles, available software and technology at Sydney Analytical and more complicated **XRD techniques**.

The workshop itself was an extraordinary success and we can't thank Dr. Sameul Duyker enough for agreeing to deliver it! A link to the recording is included [here](#).



THE UNIVERSITY OF SYDNEY

School of Chemical and Biomolecular Engineering

Powder diffraction: fundamentals and advanced techniques

- Basic principle of XRD
- XRD sample preparation
- XRD data analysis
- Advanced XRD methodologies

12 – 2 pm 23rd Aug 2021
Zoom 92973389495

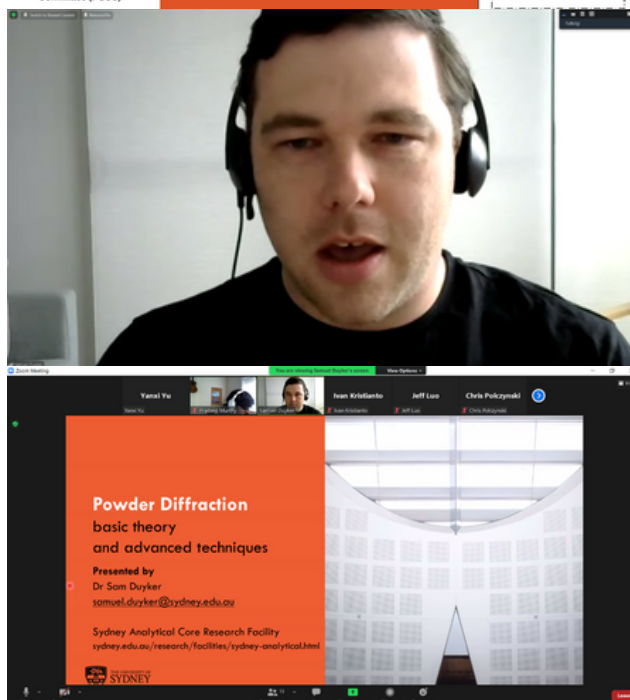
Guest Presenter



Dr. Samuel Duyker
Professional Officer,
X-ray Techniques

Background
Dr. Samuel Duyker completed his Ph.D. at the University of Sydney, after which he undertook post-doctoral work at ANSTO and Oxford before returning to Sydney on a Criton Fellowship in the School of Chemistry. His experience lies in the physical and chemical characterisation of advanced functional materials with a focus on in situ experiments under non-ambient conditions.

Role
Dr. Samuel Duyker supports researchers using X-ray powder diffraction techniques at Sydney Analytical. This includes training users in instrument operation and data analysis, including database matching and Rietveld refinements.



ALUMNI

Below is a list of students who have recently completed their research thesis in 2021. These students have taken an extensive amount of blood, sweat and tears over several years to get their contribution to research developed, completed and circulated. This is not an easy task and so they should be truly congratulated for their hard and dedicated efforts!

Please connect with us on [LinkedIn](#) for future updates about current and past students, professors, staff, etc. or even CBE activities.

Student	Thesis title	Supervisor	Date completed
Haozhu Wang	Cobalt Phosphide Single Site Electrocatalysts derived from 2D ZIF-8 for Hydrogen Evolution Reaction	Yuan Chen	24 September
Haoyue Sun	Sustainable Process from Wastes to High Value Products	Jun Huang	3 August
Jingrui Ye	Fabrication and Microscopic Characterization of AlCoCrCu _{0.5} FeNi High Entropy Alloy Thin Films	Zongwen Liu	29 July
Junsheng Chen	Ternary metal Oxide/(Oxy) Hydroxide for Efficient Oxygen Evolution Reaction	Li Wei	29 June
Hee-Chan Jang	Developing bacterial fungal consortia for biomining of low-grade saprolitic nickel laterite minerals	Marjorie Valix	22 June
Van Chinh Hoang	Biomass-derived carbon dot-based composites for energy storage and conversion	Vincent Gomes	4 May
Ziwen Yuan	Multifunctional membrane distillation for hypersaline brine treatment, low-grade heat harvesting and lithium recovery	Yuan Chen	31 March
Naveed Aziz Khan	RF Magnetron sputtered AlCoCrCu _{0.5} FeNi High Entropy Alloy (HEA) AND High Entropy Ceramic (HEC) thin Films	Zongwen Liu	5 March
Muhammad Adil Riaz	Metal-carbon nanocomposites for electrochemical sensing of hydrogen peroxide	Yuan Chen	19 January
Shunyao Yan	Dual template pore engineering of whey powder derived carbon as efficient oxygen reduction reaction electrocatalysts for primary zinc-air batteries	Li Wei	19 January
Xiao Sui	Graphene-Based Composite Membranes for Efficient Separations	Yuan Chen	22 December (2020)

OTHER NEWS

STUDENT LIFE GRANT

September 26

We were lucky to be provided with a **Student Life Faculty Grant of \$2,000 by the Faculty of Engineering** for the second semester of 2021. Our aim was to utilise the money to organise social events, especially in the wake of the recent COVID lockdown. We utilised the money to hold the trivia events, as well as the end of year event.

CERS MEETING

June 29

We were very fortunate to meet with the newly-formed Chemical Engineering Research Society (**CERS**) at UNSW. We of course plan to hold new collaborative social, research and professional events between UNSW and USyd. We can all share research experiences, meet new people, make new friends and perhaps even find new collaboration opportunities!

Even more excitingly, CERS president **Angie Tjandra** and vice-presidents **Koentadi Hadinoto** and **Xichu (Cynthia) Wang** were former students from our very school and they are too are very excited to collaborate with us in the near future.

Looking forward to it all!

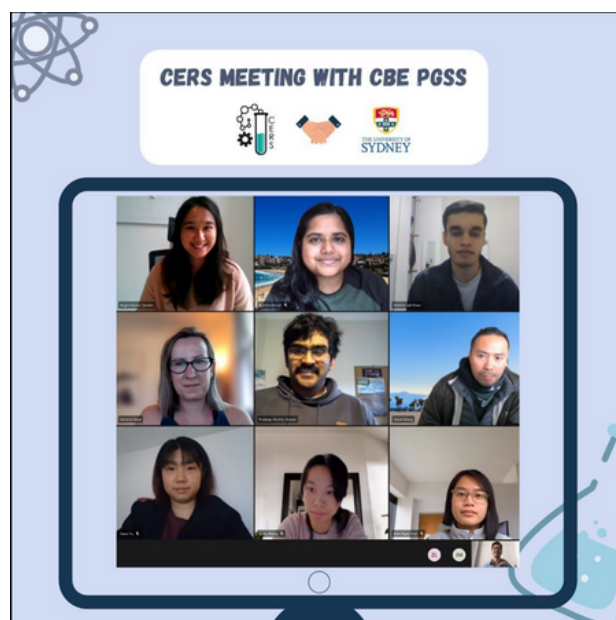
WELCOME BBQ

April 8

CBE PGSC held a **BBQ** (traditionally in our own courtyard) on April 8th to welcome **new HDR students** to the school. This is always a great way naturally to meet new people and support them for (I believe) making the right decision to slave away tiresome days and nights to make a difference to the world!

Besides the delicious feast of grilled sausages and patties (meat and vegetarian, which would probably make Gordon Ramsey angry!) prepared by **A/Prof. John Kavanagh** and some HDR students (what else were we there for?), this included a speech from our Head of School (**Prof. Dianne Wiley**), self-introduction of new students and the committee members themselves.

Everyone was chatting enthusiastically in the backyard. I guess in the process, everyone made some very good new friends. We never thought that this would be the last BBQ event before lockdown! If there isn't another one this year, then we'll have an extra one next year (fingers crossed!).



ANNOUNCEMENTS

HDR REPS AND ADMIN MEETINGS

Monthly meetings

Once per month, two HDR reps (Pradeep and Yanxi) attend meetings with representatives from other engineering schools or organisations to discuss progress or new ideas for improvement among the postgraduate engineering students.

Some of the ideas surfaced have included more support for mental health among students and even the development of a new society for engineering postgraduate students, which would be an exciting opportunity to broaden the engineering student network at USYD and also have more funding for more future activities.

If you would like to share any ideas around for us to contribute to the meetings, then please email us at cbepgsc@sydney.edu.au with your ideas.

FUTURE NEWSLETTER CONTENT

As this is our first newsletter, we will be including more content over time, with ideas such as:

- Honouring researchers or research students for their achievements or publications
- Major PG student milestones for the year
- Alumni interviews
- School and faculty updates

If you would like to share any ideas around for us to contribute to the newsletter, then please email us at cbepgsc@sydney.edu.au with your ideas.

FUTURE EVENTS

We have been successful in holding various online events and two in-person events over the year considering the COVID situation this year. That said, we hope that 2022 does not bring too many hindrances to social activities and that we can continue to return to in-person activities.

Having held both research-based and social activities across the year, if there are any other activities you would like for PGSC to host, such as seminars, industry talks, research workshops or social events, please let us know at cbepgsc@sydney.edu.au.