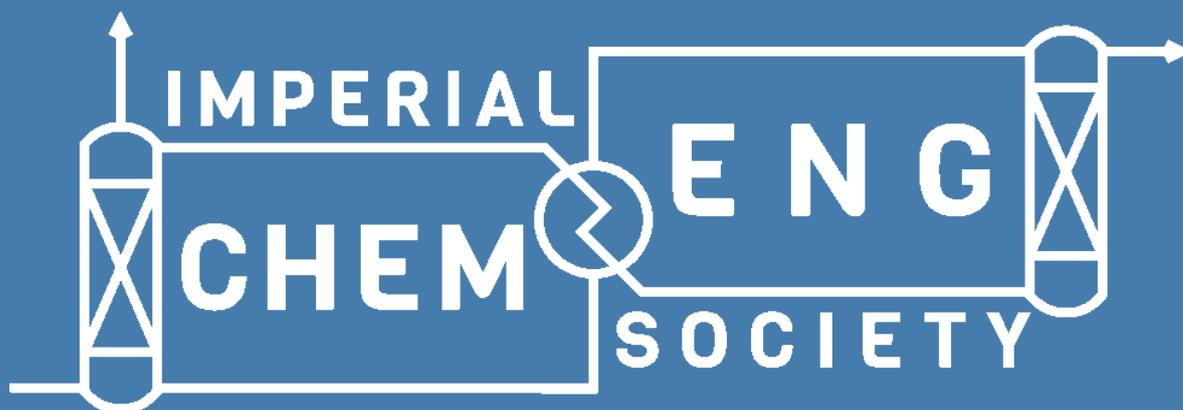


CREDIT: XIAOYU LIU. WINNER OF CHEMICAL ENGINEERING PHOTO CONTEST (PG, SCIENCE)

THE  
PIPELINE

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ISSUE #4. 2019/20



## CHEMENG SOC SOCIAL MEDIA



GENERAL FACEBOOK PAGE: [www.facebook.com/icchemengsoc](http://www.facebook.com/icchemengsoc)



FLICKR: [www.flickr.com/photos/chemengsoc/albums](http://www.flickr.com/photos/chemengsoc/albums)



EMAIL: [guilds.chemeng@imperial.ac.uk](mailto:guilds.chemeng@imperial.ac.uk)



WEBSITE: [www.chemengsoc.com](http://www.chemengsoc.com)



INSTAGRAM: [www.instagram.com/icchemengsoc](http://www.instagram.com/icchemengsoc)



LINKEDIN: [www.linkedin.com/company/imperial-college-chemical-engineering-society](http://www.linkedin.com/company/imperial-college-chemical-engineering-society)

## DEPARTMENTAL SOCIAL MEDIA



WEBSITE: [www.imperial.ac.uk/chemical-engineering](http://www.imperial.ac.uk/chemical-engineering)



TWITTER: [www.twitter.com/imperialchemeng](http://www.twitter.com/imperialchemeng)



LINKEDIN PAGE: [www.linkedin.com/showcase/department-of-chemical-engineering](http://www.linkedin.com/showcase/department-of-chemical-engineering)

LINKEDIN GROUP: [www.linkedin.com/groups/1829242](http://www.linkedin.com/groups/1829242)

## OTHER STUDENT MEDIA OUTLETS



CHEMENG CONVERSATIONS: [www.imperial.ac.uk/chemical-engineering/research/chemeng-conversations-](http://www.imperial.ac.uk/chemical-engineering/research/chemeng-conversations-)



FELIX: [www.felixonline.co.uk](http://www.felixonline.co.uk)



ENERGY JOURNAL: [www.energyjournal.co.uk](http://www.energyjournal.co.uk)

# IN THE PIPELINE

## A NOTE FROM THE EDITOR

*Happy New Year*

It's a new decade, so it's the perfect time to reminisce about everything that's happened over the past few months.

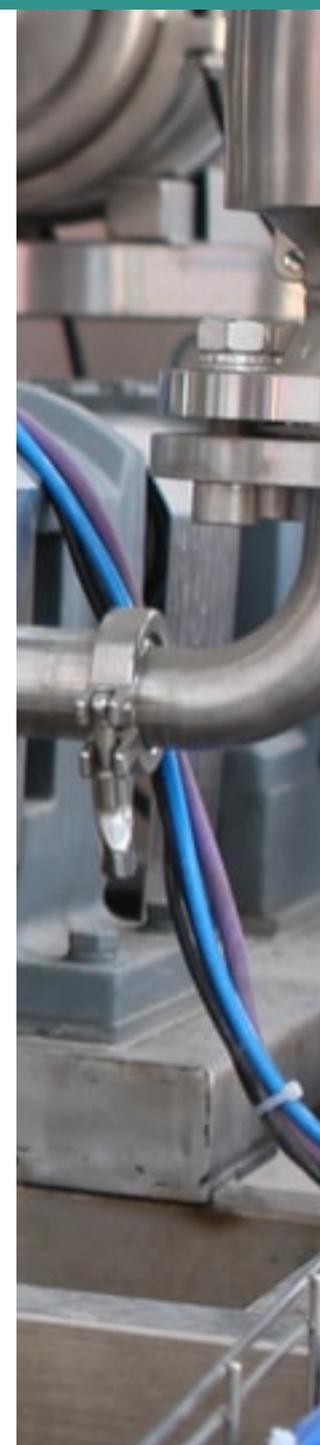
There have been many monumental achievements by students. **Ravi Shankar**, PG/ChemEng Communications, won the RSC Chemistry Communicators Challenge C&M 2019. ChemEngSoc attended PwC's Opportunity Challenge for the first time, coming second and beating Imperial BioEng (Team: **Fintan O'Connor** - Y4, **Aris Mornto** - Y3, **Noah van Surrell** - Y3). The Energy Journal, led by ChemEng's **Humera Ansari** (PG), won Bright Network's Society of the Year Award (Environment). Plus, the **Departmental Photo Competition** winners were announced - check out page 15 to get \*inspired\* by all the entries.

Meanwhile, **Dr. Pavani Cherukupally** has published in Nature Sustainability, about a reusable sponge that can soak up over 90% oil wastewater microdroplets in just ten minutes. (Paper here: [is.gd/SXo3eH](https://is.gd/SXo3eH)). Chrysalix Technologies (co-founded by **Dr. Florence Gschwend** and **Prof. Jason Hallett**) have received major funding, allowing the construction of an initial pilot plant.

Enough past success. Let's talk about the future. **Frank Morton**, the national ChemEng sports day, is on its way. And when I talk sports, I'm also including pool, escape rooms and chess. We're engineers after all. **Talent Show** is almost here. This is the perfect time to show off your ability to sing, dance or down strawpedos. Sign-up link will be up soon. It is also a chance for staff to show off their performance skills with their \*special dance\*. Want to witness their previous 'attempts'? YouTube it. We also have a **PUB CRAWL** this Wednesday, starting from the Union. Timings will be posted on FB and the sosh meds (see p2).

That's my story. Peeeeeeeeeeeeeeeeeeeace.

*Kathryn*



Show Zahra this voucher.  
First 30 to do so will get their first drink **completely free**. Save the environment - show us the pdf version.



**MUMS AND DADS**

# PUB CRAWL

# CALENDAR

## YOUR SOCIAL LIFE - SORTED

### PUB CRAWL

WEDNESDAY 8TH JANUARY, 6PM START, MEET @ UNION

Start the decade off right!

If your New Year's celebration left you lacking, let us help you refamiliarize yourself with the local pubs now that you have 2020 (blurred) vision. As with all good nights out, we meet at the Union from 6pm and end at Slug (now called The Redback). Take a group with you because to keep things interesting we've got some challenges waiting for you along the route. From best pictures to boat race challenges. ChemEng families, this is a great time to catch up after the Christmas break. ChemEng kids can even get their parents something to wear for Slug so be sure to invite them! Let loose before the term really gets started and we are drowning in coursework.

Route outline: Union -> William Morris -> Belushi's -> Oyster Rooms -> Slug

### ARTHUR D. LITTLE WORKSHOP

THURSDAY 9TH JANUARY, 6PM, - SIGN-UP REQUIRED

For those who have experienced the joys of S&LP, you will remember the guest lecture from Arthur D. Little. Many of you may have wondered if you could get a job like that. Well... here's your opportunity. ADL are one of world's leading engineering and risk management consultancies. They are offering students an \*exclusive\* technical consulting workshop. This is unique at Imperial, and everyone is welcome to attend. Only 30 places available – apply now: [tinyurl.com/vxn82rj](https://tinyurl.com/vxn82rj)

### CHEESE AND WINE

FRIDAY 7TH FEBRUARY, 6PM, CPSE

Over to Chris Tighe to sell this to all you \*classy\* Y3UG/Y4UG/MSc/PhD/staff: "Cheese and wine are two of my favourite things in the whole world (3rd and 7th, respectively) and there's very little which could improve on them. One thing would be for these things to be generously subsidised by the ChemEng department. So. imagine my surprise and delight when I found out that the ChemEngSoc were organising an evening of wine AND cheese ALL generously subsidised by the ChemEng department! Hands down my favourite event of the year so far." £5 a ticket, unlimited wine and unlimited cheese. What's not to love?

### FAWLEY TRIP (EXXONMOBIL)

FRIDAY 14TH FEBRUARY, ALL DAY, FAWLEY - SIGN-UP REQ.

Love is in the air... Will you find the internship of your dreams at Fawley? ChemEngSoc are heading to Fawley Refinery - the largest in the UK, with massive developments ongoing. It's not all about Exxon though – you'll get to spend time with coursemates as you experience the nightlife of Southampton (yep, it exists).

## FRANK MORTON SPORTS DAY

MONDAY 17TH FEBRUARY, ALL DAY, BIRMINGHAM - £35, SIGN-UP

Frank Morton was a chemical engineer. He wanted to leave a legacy, so set up a sports day between two universities he'd previously worked at: Birmingham and Loughborough. Then, other universities wanted to join in. The result is the legend that exists today. ChemEng chat about FM long beyond graduation. This year, FM is in Birmingham - you won't have to get up at 4am to travel. And 'sports' include pool, chess and escape rooms as well as football and rounders. We even get the morning off afterwards to recover. Buy tickets here: [is.gd/NRthWm](https://is.gd/NRthWm)

## NEWITT LECTURE

TUESDAY 3RD MARCH, 6PM, LT1

For those of you not in the laps of Big Oil (i.e: basically every undergrad in the department). This is your chance to hear the CEO of CeresPower, a world-leading developer of low cost, next generation fuel cell technology. And, by the way, the CEO is an Imperial ChemEng alumnus \*departmental humble brag\*.

We're not just celebrating past students. Undergraduates will get rewarded during the departmental undergraduate prize ceremony. More details out soon...

## TALENT SHOW

THURSDAY 5TH MARCH, 6PM, LT1

On an eerie, cold night in March, ChemEng students crawl out of their deadline-looming burrows and enjoy a tranquil night of entertainment. Here, they learn to admire, or laugh at, their peers as they attempt to display their talents which are not related to solving differential equations. Judged by BP representatives, but unfortunately not leading to job offers, shows include songs, dances, rap battles and occasional pole dancing. Acts are not limited to students however - lecturers can also get involved and show to the world they are more than the machines we often perceive them as. Pictures will not do this event justice, so enjoy some sensational videos from YouTube showing some of the acts from 2019. Some of them are amazing. And then there are the lecturers. Watch clips here: [is.gd/1xAtoz](https://is.gd/1xAtoz). Watch out for sign-ups - we want \*you\* to perform

## ANNUAL DINNER

WEDNESDAY 18TH MARCH, 6PM, LT1

Fourth Years and MScs - make sure you've saved the date for ChemEngSoc's Annual Celebratory Dinner in March! The dinner serves as a celebration of almost getting to the end of your UG/PG degrees! The evening, also attended by many of our most loved staff members from the department, will consist of great food, music, entertainment and company! More information will be released later this term!

## Heads up, ChemEng:

"We want to make events as accessible and well-attended as possible. We now have a **small budget available** to help any students who feel like they are not able to afford to attend ChemEngSoc events. Please get in touch with me ([f.marsh@imperial.ac.uk](mailto:f.marsh@imperial.ac.uk)) for details and how you can access the funding."

*Faith*



# PREVIOUS EVENTS



Shell trip



AstraZeneca tour



Careerathon  
"The atmosphere was more energetic than the enthalpy of vapourisation of water"

Opportunity Challenge  
" WE LOVE ASSURANCE AND MERGERS! "



Christmas Dinner  
"DON'T GET ME STARTED ABOUT THE DRUNK WOMAN WHO CAME UP TO OUR TABLE "



# ExxonMobil

*The trip to Southampton is back!*

"The best trip of the year"

"A thoroughly enjoyable experience"

"Valuable for my degree"

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## 2020 VISIT: FAWLEY REFINERY

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Join us on a site visit to Southampton with plenty of networking, interactive activities and tours of the site

**Date: 14/02 - 15/02**

**Location: Fawley Refinery Southampton**

**Includes: Transportation, Accommodation, Food and Activities**

**Buy tickets on the ChemEngSoc Shop**  
**<https://www.imperialcollegeunion.org/shop/>**

# SPORTS

## FRANK MORTON 2020 NEWS

BY JAMES MORRISSEY

Although we are still waiting for the final, final confirmation from Shell, we can announce the winner of the Frank Morton 2020 T-Shirt competition. Taking inspiration from Ludacris/Usher and adding a Chem Eng spin, Carl Behmer designed the winning t-shirt and will receive a free FM ticket. Congrats Carl!



Frank Morton ticket sales are ongoing, with limited numbers, so don't miss the chance to book your place at the biggest Chem Eng event of the year! You could be representing Imperial in one of these sports:

- Athletics
- Badminton
- Basketball
- Bowling
- Chess
- Climbing
- Darts
- Dodgeball
- Escape Rooms
- Football
- Hockey
- Laser Tag
- Netball
- Pool
- Quidditch
- Rounders
- Squash
- Table Tennis
- Tennis
- Touch Rugby
- Ultimate Frisbee

For more information, contact James at [rjm216@ic.ac.uk](mailto:rjm216@ic.ac.uk) and keep an eye out for FM posters and emails.

*James*

Chemical Engineering Sports Officer

# THE BRIEFING

## NEWS FROM THE WORLD OF CHEMENG

BY LOUIS MARTINE (MSC)

### Wake-up to Climate Change

2019 has been the “most positive year I can remember on climate change”, says Dave Reay, a climate scientist at the University of Edinburgh. Powerful influences from Thunberg to worsening scientific predictions have led the public to beg for climate change action. Finally, politicians are tripping over themselves to make some progress!

**Read more:** New Scientist | 21 December 2019 (is.gd/LGIGVR)

### 2020 visions: Science & Tech

Do you want to be like Peter Pan, and never grow old? Two drugs are in development and will undergo large-scale trials this upcoming year, brining us closer to ‘conquering aging’. This comment piece also explores key science and tech themes in the upcoming year, including commercial vaccine deployment, key climate summits and microplastic health risk investigation results.

**Read more:** New Scientist | 21 December 2019 (is.gd/uUrc9A)

### Recycling? I'll drink to that

Investment in new water recycling plant technology has allowed Carlsberg so reduce water consumption by 10% since 2017 and improve energy efficiency. A 50% saving is predicted to be reached by 2030.

**Read more:** DECEMBER / JANUARY 2019 | The Chemical Engineer | page 7 (is.gd/YqkLET)

### Slack regulations bite back

The US Environmental Protection Agency withdrew the ‘Chemical Disaster Rule’, stating they were an unnecessary burden. The rule states that plants must “disclose potential chemical risks to local emergency responders”. Whilst welcomed by industry, a blast at a Texas chemical plant injured three people just days later.

**Read more:** is.gd/gg2FSg

### Hyd-den gem

The EU has unveiled a €60bn investment initiative to help develop hydrogen projects to aid industry and transport decarbonisation. The projects include producing hydrogen at scale, hydrogen transportation and decarbonising the steel industry. After successful project completion, 35m tonnes/yr of CO<sub>2</sub> emissions are expected to be saved.

**Read more:** is.gd/cAS3pp

### #@!\*ing Cambridge.

Researchers at Cambridge have created an “artificial leaf” which produce syngas from sunlight. Carbon dioxide and water fed into the system, and no other emissions are produced. Current efficiencies are less than 0.1%; anything above 5% is typically considered viable. Future research aims to sustainably produce liquid fuels without syngas as an intermediate.

**Read more:** is.gd/MIJx5t

# NEW YEAR... NEW YOU?

\*WOOP\*

BY FAITH MARSH

Happy New Year! As we enter a new year - and a new decade - there will be lots of focus around resolutions. Following on from my last article about neuroplasticity and "rewiring" our brains, this article focuses on **how to achieve the goals** that you set. These types of approaches challenge the idea that positive thinking alone will help to achieve desired outcomes. There has been quite a lot of research done on how to change habits... so the technique outlined here is just one suggestion based on evidence found!

**Remember:** strategy is key. It's great to have plans to improve your habits or wellbeing. Sticking to goals is a much harder challenge and can leave us feeling worse for not achieving what we plan.

Firstly, it is best to have really **specific goals** in mind. For example rather than "I want to exercise more", "I want to exercise for at least 30 minutes for 4 days of each week" is a much better goal.

The next thing is to **start working towards a single goal** - making small changes to your routine and focusing on one thing at a time can make changes easier to manage. Engaging in a technique called **WOOP** (see Fig. 1) has been shown to increase wellbeing and improve

academic performance. It is a **simple strategy** to implement goals. More information can be found online at [woopmylife.org](http://woopmylife.org). An extract from the website, detailed below, shows you how to 'woop':

**What is your wish?** What is your most important wish/concern? Pick a wish that feels challenging but that you can meet within the next month.

**What is the best outcome?** If your wish is fulfilled, what would that mean? What would be the most positive outcome? How would fulfilling your wish make you feel? Identify your best outcome and imagine it as fully as you can.

**What is your main inner obstacle?** What is it within you that holds you back from fulfilling your wish? It might be an emotion, an irrational belief, or a bad habit. Think more deeply—what is it really? Identify your main inner obstacle and take a moment to imagine it fully.

**Make a plan.** What can you do to overcome your obstacle? Identify one action you can take or one thought you can think to overcome your obstacle. Make the following plan for yourself: "**If... (obstacle), then I will ... (action or thought)**". The order of this is really important, so if you decide to have a go make sure you do this step by step!

**If you'd like to discuss your goals, or anything else, get in touch.**

FAITH MARSH is the departmental wellbeing adviser. Get in touch if you need advice, a chat or more info about extra funding: [f.marsh@imperial.ac.uk](mailto:f.marsh@imperial.ac.uk)

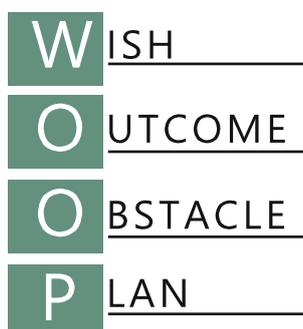


Figure 1:  
The  
WOOP  
method

# UNCLE B

## SMART, SASSY, AND WISE - YOUR GO-TO GUY

Thanks to everyone who keeps writing questions, my job has been a lot easier this year! Right, on with the show. Here's a collection of "the good, the bad and the... downright strangest" questions I've received for this edition:

### THE GOOD

#### Q: Where are the first aid kits?

A: Great question! So great that... yeah, I don't know either. It really should be common knowledge soooooo hey editor, any ideas? (Ed. - Don't look at me... @Dept, anyone know? First aid practitioners can be found across the department if needed)

#### Q: How to win one's heart

A: Everyone is different, which is a great thing because how dull and boring life would be otherwise. Sadly though this means there's no unified theory on that. Find out more about said person, pay attention to them and listen to (instead of simply hearing) what they have to say. Good luck!

#### Q: How do you deal with crappy data / Why will my simulation not converge?

A: Welcome to the world of research! Don't just throw everything away and start over, see what can be learnt from the bad results. What could be causing the bad data or slow convergence? Finding the root cause of a bad result is much better than just blindly retrying and 'hoping for the best'. After all, "Insanity is doing the same thing over and over again but expecting different results".

#### Q: How to stay awake during lectures?

A: Sit closer to the front (where falling asleep would be more embarrassing), caffeine, good night of sleep, caffeine, be engaged with the contents of the lecture, caffeine and make effective use of the lecture breaks. Oh, and caffeine.

### THE BAD

#### Q: Is it bad manners to answer a question with a question?

A: Is it? Wait...

#### Q: Why stay in lectures if Union is so close?

A: Or, as I like to ask, "Why are people from Beit the latest out of everyone?"

### THE DOWNRIGHT STRANGE

#### Q: When will March come?

A: After February.

#### Q: I don't understand

A: I think that's a good place to end it. As I reply to these on the eve of 2020, I want to wish you all a happy, healthy and successful new year ahead.

ChemEng Love,

*Uncle B xoxo*

Got a \*\*\*burning\*\*\* question for Uncle B? Write your questions on the board around the Department.





# CHAT

# WITH

# A

# GRAD

KATERINA TSANGARI, CLASS OF 2008

BY HIREN PANDYA

## BIO

**Name:** Katerina Tsangari

**Job:** Group Public and Regulatory Affairs Manager, Coca-Cola Hellenic

**Humble Brags:** Captain of Imperial's Volleyball Team; ten years graduated, and operating at international level

This week Hiren spoke to Katerina Tsangari, an Imperial alumna of Coca Cola Hellenic on her experiences since graduating from ChemEng and her advice for current students.

**What has been your career path since Imperial?**

Following my graduation from Imperial, I went to do a Masters in Engineering for Sustainable Development at the University of Cambridge. Following this, I started off my career working for Lanitis, the Coca Cola bottler in Cyprus. Lanitis is a member of the Coca Cola Hellenic Group, a group of companies which bottle Coca Cola-branded products in 28 countries. I started there as the Health & Safety and Environment Coordinator for all the facilities on the island. This meant that I had to write, implement and review procedures for Health & Safety and

environment, based on both local and European legislation as well as strict Coca Cola Company requirements for all plants and facilities. From there, I was promoted to Environmental Supervisor for both Greece and Cyprus, where I was in charge of all environmental matters for plants and facilities, and I moved to Athens where most plants were located. Wanting to try my hand at a different industry, I had a one-year gap from Coca Cola where I worked for an oil storage terminal back in Cyprus as the Health & Safety Coordinator. Following this year, a job opportunity came up back at Coca Cola at Group level, working as the Group Public and Regulatory Affairs Manager - my current role.

### What does your current role involve?

I would characterize my job as being an internal consultant for our countries to help them achieve regulatory compliance, but with an expertise and focus in packaging recovery, such as making sure our recovery organizations are working efficiently at cost parity but that they are also achieving their targets. I also try to make sure that we are prepared for future regulatory requirements and to achieve as high recovery rates as possible.

### What are the best/worst parts of this role?

I get exposure to 28 different countries and what is happening in the packaging recovery sector in each one - which is an incredible experience to have. However, the most difficult aspect of my job is that I actually can only advise and direct, and cannot implement actions directly on the ground.

### What is the biggest challenge you have faced since graduation?

Motherhood with young children a year apart and a full time job.

### What skills/experiences were most useful to you when moving into your current career?

Plant and operational experience – hands-on work. I myself had to collect recyclables from plant's yard to make sure we were audit ready. But it is of utmost importance having hands on plant experience (or closest to it depending on your sector) before doing anything else.

### Which lecture course have you used the most since Imperial?

I would have to say process analysis...not in the actual plant sense but more in the analytical way you have to deliver things.

### What is your most memorable experience from your time as a student at Imperial?

Operating the pilot plant. Pressure kept building up and we couldn't figure out why, until at the last minute - before we blew the plant and the whole department up - the prof figured out we had forgotten to open a valve... fun times.

### What is one piece of advice you would give to every student on the course?

Nothing will come to you just because you are good. Make the extra effort, take that summer internship, that year in industry or abroad, or that extra language. It's not only about the subjects you get taught but also about your experiences.

I believe the reason I have my current position is because I try to make the best out of any situation I am in and put the highest effort possible into every meeting I have. My manager and I were invited to a cross-functional workshop about packaging recovery - an area for which we were not responsible at the time. Because of my experience with the local recovery organization in Cyprus, I made the closing presentation and was the only one to speak out during this meeting. It impressed the Group team enough that a year later I was offered this position out of the blue.

Regardless of the situation you are in, whether you consider it part of your job or not, make sure that you are the best version of yourself. If I just sat back, made myself as small as possible and tried very little, I would have probably been under the radar of the Group and therefore would not have been considered for the position.

### Do you miss Imperial?

Yes and no. I have a lot of great memories and I had a blast but I think everyone should reflect on their time spent somewhere - not dwell on it. The past is the past and it is what helps you move forward so onwards and upwards!

## QUICK-FIRE QUESTIONS

**Pineapple on pizza?** Yes.

**Favourite lecturer?** Stephen Richardson

**Star Wars or Star Trek?** Star Wars.

**Worst module?** Finance for Non-Financials

**Favourite ChemEng year?** Fourth. Most brutal but most satisfying.

**GOT MORE QUESTIONS?** Get in touch: [linkedin.com/in/katerina-tsangari-67137314/](https://www.linkedin.com/in/katerina-tsangari-67137314/)

# 44TH NEWITT LECTURE

IMPERIAL COLLEGE LONDON, CHEMICAL ENGINEERING

~A celebration of past and present students~

**Speaker: Mr. Phil Caldwell**

**CEO of Ceres Power, a solid oxide fuel cell technology company; alumnus of Imperial Chemical Engineering**

Followed by a departmental undergraduate prize ceremony. Come support your friends!



**Lecture Theatre 1, ACEX 250**

**3rd March 2020, 6 - 7.30pm**

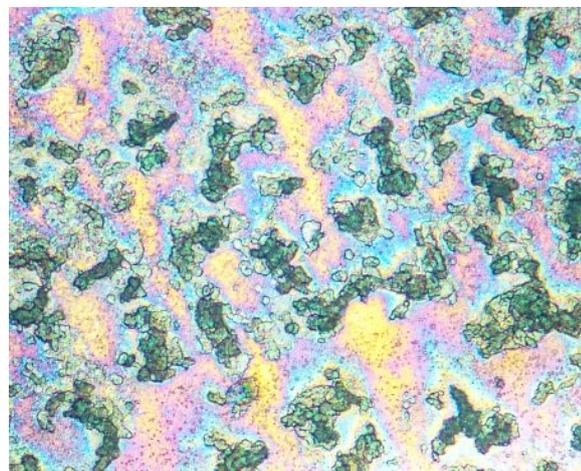
# PHOTO CONTEST 2019

## THE WINNERS OF ETERNAL GLORY

### UG: SCIENCE



Noah Van Surrell (Y3)

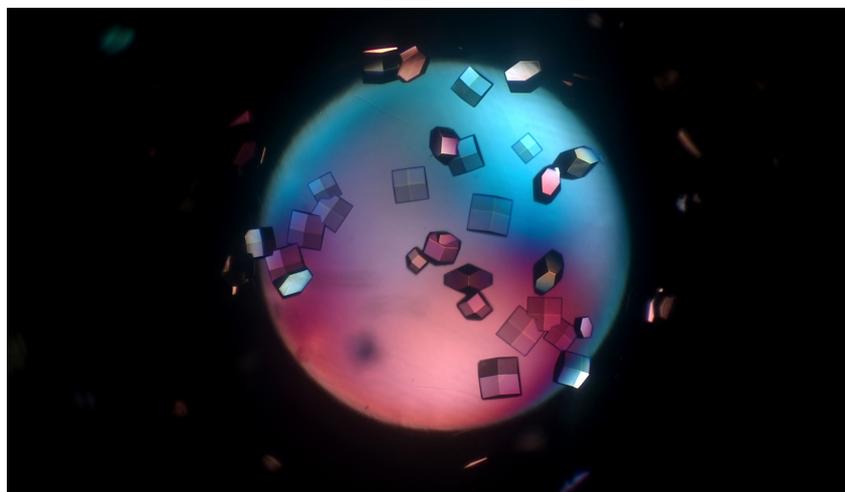


Pavan Inguva (graduated)

### PG: SCIENCE



Seb Green



Xiaoyu Liu

### STAFF WINNERS (NO CATEGORY)

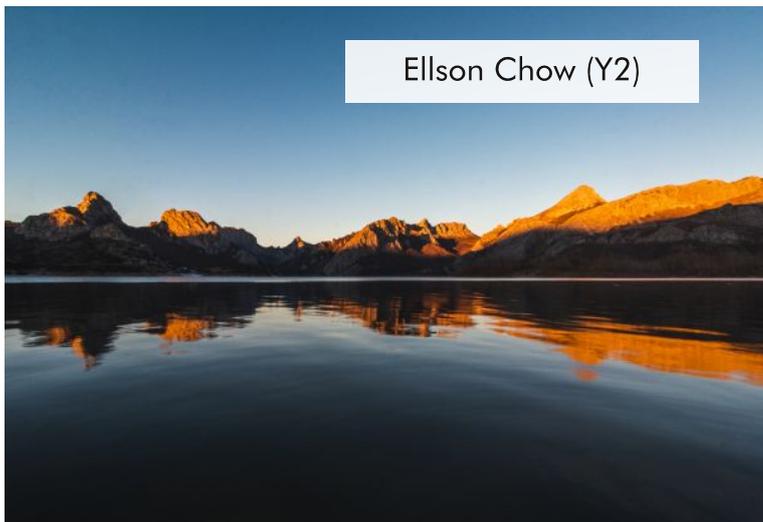
Brice Saint-Michel

Paul Fennell

## UG: BLUE



Pavan Inguva (g)



Ellson Chow (Y2)

## FEELING INSPIRED?

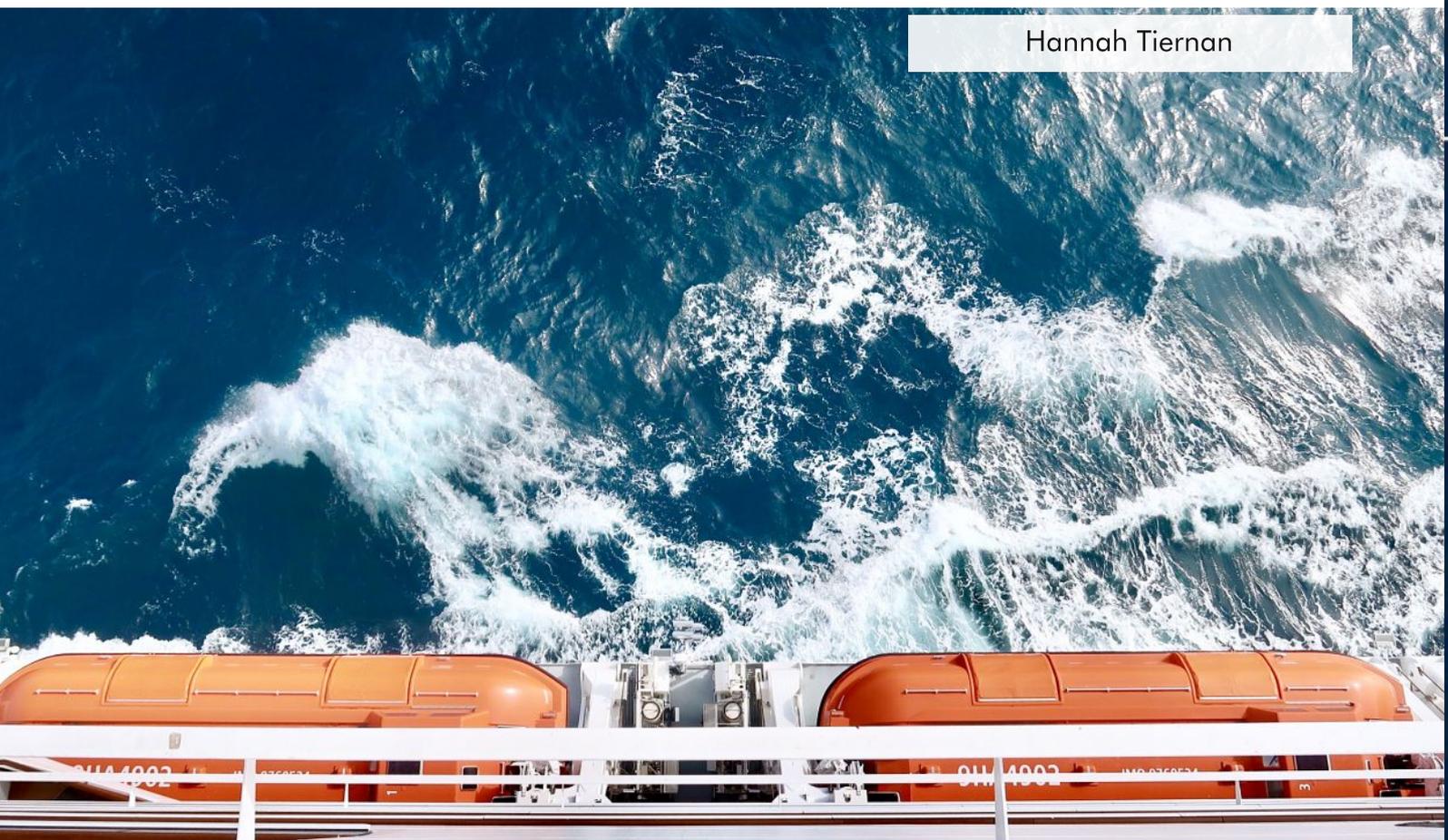
Me too.

ChemEngSoc are preparing to run this year's Photo Competition... but we need your help.

We are struggling to come up with a theme.

Do you have any ideas? Email us, FB us, flag us down in the common rooms and give us your ideas.

## PG: BLUE



Hannah Tiernan



Xuanyu Tong



# Save The Date

FOR THE CHEMENGSOB

## ANNUAL CELEBRATORY DINNER

### 18.03.2020

MILLENNIUM GLOUCESTER HOTEL

For 4th yrs and MS's

*More information next term*

# UROPS ARE U-ROP FOR IT?

BY KATHRYN JAITLY

We've hit the crunch time. SMEs will start to look for candidates to fill their internship and job positions. This is a busy time for everyone.

However, you may not want to go into industry - perhaps you want to remain in research? Or perhaps you want to get some experience before applying for the big firms. (Looking at you, first and second years.) Maybe you just want to spend some time hanging around London without the threat of massive deadlines looming over your head.

Fear not. Imperial's UROP (Undergrad. Research Opportunity Placement) scheme allows students to join a research group over summer break. And Imperial gives out bursaries - approx. £300/week. Not bad. However, you need to apply early - if not, the money will run out (as Rajaram will attest to...)



Here's some experience from current students:

**RAJARAM GANESAN:** currently Y3



I undertook a six week UROP in the

pilot plant with Colin [Hale], learning how to operate the pilot plant. I was working with Colin, alongside a large group of second year students, to understand the CCS plant and help to improve its performance.

We carry out Pilot Plant Project in second year. That only scratches the surface of what the plant can do. We take the step further, learning more about the electronics and mechanics that make up the plants. We have the opportunity to operate the plant by ourselves, and learn how to optimise the plant by manually tuning controllers.

During the placement, we had the opportunity to work with ABB to implement a new dashboard interface which summarises key parameters in a remote location. This is the first plant to have the technology - we pioneered something new.

We also get the opportunity to present the pilot plant to guests on Colin's behalf - you truly get to know the plant from top to bottom, plus improve your presentation skills. It isn't all work - we hang out a lot, and I got to know a lot of people who I hadn't met over two years of studying here. Colin even holds an annual dinner for students most years.

This UROP is perfect for second years to extend their knowledge of plant operations as well as soft skills. All you need to do is email Colin to ask for a chat about

UROPs, then ask him if it's a possibility. Colin agreed on the spot.



UROPs don't just occur on Imperial ground. International research opportunities also occur - these are known as IROPs. One of the students who took part in these schemes is Aniket:

**ANIKET CHITRE:** currently Y4



This past summer I spent seven weeks in the Hamel Lab within the Department of Chemical Engineering at MIT investigating the continuous culturing of yeast to produce bio-ethanol. The motivation behind my project and similar research in the lab was to add value to industrial processes by using microorganisms to convert waste streams into useful by-products. I explored this with a chemostat (continuously operating bio-reactor) at the lab scale by using yeast to ferment sugars into ethanol.

This project produced numerous firsts for me personally, notably including my first experience in a bio-lab, as well as including a lot more hands-on engineering work than I am typically used to. The lab work was a great learning opportunity and in addition to this I cherished the opportunities that this

programme facilitated out of the lab. This included: travelling, properly getting to explore the Cambridge & Boston areas, as well as a weekend away to New York city; meeting lots of new people; and exposure to American society & working culture. I have had the time to enjoy Boston from doing the standard touristy things like walking the Boston Freedom Trail, to catching a Red Sox game, to my personal highlight being 4th July Independence Day celebrations.

I have fallen in love with MIT, from the things you can see like its wonderful campus, to the things you cannot, like its quirky and intellectual culture. I have thoroughly enjoyed my IROP experience and it's been everything I imagined and more!

#### Key tips:

- Ask older students for advice - many students do UROPs.
- If you have a particular research interest, use the Imperial website to track down researchers in that area.
- Lecturers may take on students; speak to lecturers to see if they are willing to do so.
- The non-participating staff list is not up-to-date - Prof. Matar takes on students (typically in CFD/VR).
- You may not get immediate response from researchers... don't worry. Remember to chase up after a couple of days. They've likely forgotten you sent the email.
- You don't need world-class knowledge of the subject, but make sure you know what you'd like to work on/if you're open to everything.
- You can work in any department at Imperial - as long as you have the right skills. Chemistry is fine... even Earth Sciences (electrochemistry).

More info: [www.imperial.ac.uk/urop](http://www.imperial.ac.uk/urop)



# PUZZLES

## TOTALLY NOT A RIP-OFF OF FELIX

### WORDSEARCH

#### THEME: THERMO

Hey first years. Editor here. We heard about the car crash that was the Christmas test. Sorry to hear that. I definitely needed a year to learn \*all the thermo\* - you've only had ten weeks. There's also no way that I would be able to cope with two tutorial sheets in a single tutorial. So kudos to you. You got this. And now back to our regularly scheduled programming ---

O T R E F R I G E R A T I O N N I K J F L V C  
S E C O N D E X Z W Y F P G R O N Z J U L O O  
C Y W H Q J Q P B L P U O N A Q O P N X G D B  
K M E E F L M X I L K U R X N Y I Q T X I S N  
A A T L B X Q Z I W Y N R O K Z T T N J B T U  
U R S M F P X W X P G P G P I Q C U R R B O J  
N G C H R A I T E I P J V J N E A R B H S N H  
C A Y O Y E Y Q Y N F F S W E H F G C G S R N  
K I C L M F E I B E T N O D J Q E N C F R A K  
Y D L T H P U U P T Z R S K G B U Y X B F C Y  
G E E Z O Z C P G P Q X O M J W Q B P K I G M  
R S S E Q F B A D O T D Z P T Z I M H C R H L  
E A Q K E N T H A L P Y Y E Y I L H L J S M M  
X H C L A U S I U S C L A P E Y R O N A T D R  
E P A N A U Q X A N R E N Y I D V C W O W N W  
M W P E V P T Y E R H N Q Q V R N R F R K B Q

Words are hidden in the following directions:



#### WORDS TO FIND:

CARNOT  
CLAUSIUS  
CLAPEYRON  
CYCLE  
ENTHALPY

ENTROPY  
EXERGY  
FIRST  
GIBBS  
HELMHOLTZ

LAW  
LIQUEFACTION  
PHASEDIAGRAM  
RANKINE  
REFRIGERATION  
SECOND

**COMPLETED THE WORDSEARCH?** Send a photo of your completed entry to [guilds.chemeng@imperial.ac.uk](mailto:guilds.chemeng@imperial.ac.uk), and you will get a \*free\* ticket to Talent Show.

Now... back to the degree.