

IMPERIAL

Department of Chemical Engineering

ChemEngDayUK
25-26 April 2024



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Welcome



Professor Omar Matar
Head of Department



Professor Camille Petit
Director of Research

It is with great pleasure that we present to you the programme for the #ChemEngDayUK24 event, hosted by the Department of Chemical Engineering at Imperial College London.

We are honoured to have received many contributions from postgraduate and postdoctoral researchers, academics, colleagues from industry and representatives from the IChemE.

In preparing the programme for #ChemEngDayUK24, we have tried to capture the essence of chemical engineering research as it is today. We have combined distinguished plenary talks from world-renowned chemical engineers, invited oral presentations and poster presentations to address cutting-edge research and new technologies across five contemporary research themes including:

- Biotechnology
- Data centric chemical engineering and process systems engineering
- Molecular systems engineering
- Net zero energy pathways
- Sustainable and efficient chemical processes

We have also aimed to inspire and foster discussions around the topic of translation with a dedicated session on 'Translating Chemical Engineering: from research to societal impact', involving a panel of experts from academia, SMEs, large companies, and investors, giving the opportunity for recent startups to showcase their work.

As we thrive to train the next generation of chemical engineers, we have organised a session on 'Integrating sustainability best practices into chemical engineering curriculum', with participation from experienced educators from across the UK.

The broader programme is designed to engage several key audiences; from early-career researchers, postdoctoral researchers and academics, to industrialists and educators. We have 5 invited presentations, 59 oral presentations and 175 poster presentations, of which 63 will be 2-minute flash presentations – all to guarantee a thought-provoking and thriving two days of knowledge exchange.

We would like to thank all the speakers, poster presenters, session chairs and sponsors for their contributions to this dynamic programme.

We would also like to give a special mention to the IChemE and Heads of Chemical Engineering for supporting the event, in particular Ms Nooreysha Choudhury (Higher Education Executive | IChemE) and Claire Cooke (Marketing Executive | IChemE).

Finally, we would like to thank colleagues and student volunteers from within the Department of Chemical Engineering; from the Organising Committee to the Scientific Committee and to members of our Logistics team who generously devoted their time to planning and assisting across both days.

Sponsors



IChemE



Conference organisation

Organising Committee

Professor Camille Petit, Director of Research

Professor Omar Matar, Head of Department

Anusha Sri-Pathmanathan, Head of Faculty Operations
and Department Operations Manager

Angela Lonergan, Project Manager

Navta Hussain, Communications Manager

Scientific Committee

**Comprising representatives from academia (research
and teaching at various career stages) and industry:**

Professor Omar Matar, Head of Department

Professor Camille Petit, Director of Research

Dr Zayeed Alam [Procter & Gamble]

Professor Benoit Chachuat

Dr Yuval Elani

Dr Ceri Hammond

Dr Christian Holtze [BASF]

Dr Lyes Kahouadji

Professor Erich Müller

Professor Sandro Macchietto

Dr Marsha Maraj

Dr Maria Papathanasiou

Dr Ronny Pini

Professor Karen Polizzi

Dr Umang Shah

Dr Chris Tighe

Logistics Team

Angela Lonergan, Project Manager

Navta Hussain, Communications Manager

Chemical Engineering student volunteers

Dionne Alexander

Eghosa Atti

Dr James Campbell

Dr Deesha Chadha OBE

Dr Jingyu Feng

Ileke Hilmy

Avery Kitchens

Dr Lana Lee

David Owen

Asheeka Padhiar

Jana Pierron

Laia Santamaria-Ortega

Alexandra Szymanska

Susi Underwood

Viji Pillai-Wixey

Speakers and panellists

Plenary Speakers

Invited Speakers and Panellists

Speakers (Day 1 and Day 2)



Professor Marco Mazzotti
Department of Mechanical and
Process Engineering
ETH Zürich, Switzerland



Professor Lisa Hall
Department of Chemical
Engineering and Biotechnology
University of Cambridge, UK

Education Session (Day 2)



KEYNOTE SPEAKER AND PANELLIST:
Professor Jarka Glassey
Department of Chemical Engineering,
Newcastle University



PANEL MODERATOR:
Professor Nilay Shah
Department of Chemical Engineering
Imperial College London



PANELLIST:
Professor Jonathan Seville
FREng, FIChemE
School of Chemical Engineering
University of Birmingham



PANELLIST:
Vivien Thurner
Newcastle University, IChemE Education
Group Student Representative



More info

tinyurl.com/ChemEngDayUK24-Speakers

Translation Session (Day 2)



**KEYNOTE SPEAKER AND
PANEL MODERATOR:**
Dr Christian Holtze
BASF



PANELLIST:
Ms Andrea Sinclair
Angel Investor



KEYNOTE SPEAKER:
Professor Sandro Macchietto
Imperial College London



PANELLIST:
Dr Rob Singh
Essex University



PANELLIST:
Professor David Fairen-Jimenez
University of Cambridge



PANELLIST:
Dr Mark Selby
CERES Power



PANELLIST:
Dr Helen (Jinghui) Liang
Labcycle



PANELLIST:
Mr Paul Swift
P&G



More info

tinyurl.com/ChemEngDayUK24-Speakers

Satellite Workshop: Equality, Diversity and Culture

Thursday 25 April | 9.30-11.30

WHERE:

Departmental Common Room
(DCR), ACEX Building 228
Department of Chemical Engineering
Imperial College London

REFRESHMENTS:

Refreshments provided

ORGANISERS:

Dr Deesha Chadha OBE and
Professor João T Cabral

REGISTRATION:

Not required | Drop-in

FURTHER INFO:

This is a pre-ChemEngDayUK24
workshop

There is broad consensus across Departments of Chemical Engineering about our responsibility, and indeed advantage, of fostering a culture of belonging and engagement that enables our students, graduates and colleagues to achieve their full potential. By supporting talent and diversity, we seek to create truly inclusive and outstanding chemical engineering communities. Our EDI strategies generally involve aspects of:

- (i) inclusive recruitment and widening participation
- (ii) training of students and staff
- (iii) embedding EDI in the curriculum
- (iv) removing barriers and supporting diverse students and staff
- (v) striking a healthy work/study-life balance
- (vi) ethical stakeholder engagement and so forth.

However, data shows that implementation is not always straightforward. In this session, we invite colleagues from Departments of Chemical Engineering to contribute (further) short talks on best practice and learnings of their EDI journey.

Please email Professor J Cabral (j.cabral@imperial.ac.uk) if you would like to contribute.



Programme

Programme

All oral presentations and flash presentations will take place in the **Sir Alexander Fleming Building (SAF)**.
All refreshment breaks and poster sessions will take place in the **Queen's Tower Rooms**.
Please see maps on page 30.

Day 1: Thursday 25 April 2024

11.50–12.50 **Registration, lunch, exhibition** – Queen's Tower Rooms
Note: Please allow 10 minutes to move to and be seated within **G16 Lecture Theatre (LT)** in SAF for a prompt 13.00 start.

13.00 **Opening remarks**
Professor Omar Matar, Head of Department, Chemical Engineering, Imperial College London
Professor Hugh Brady, President, Imperial College London
G16 LT, SAF

13.15 **PLENARY I**
Carbon dioxide management solutions – from research to demonstration
Professor Marco Mazzotti, ETH Zürich
CHAIR: **Professor Omar Matar**, Imperial College London
G16 LT, SAF

Parallel Oral Sessions

14.00	SESSION 1 Net zero energy pathways CHAIR: Professor Tim Mays University of Bath Seminar room 121, SAF	SESSION 2 Data-centric chemical engineering and process systems engineering CHAIR: Professor Claire Adjiman Imperial College London G16 LT, SAF	SESSION 3 Biotechnology CHAIR: Professor Lisa Hall University of Cambridge G34 LT, SAF
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15.00 Refreshment Break – Queen's Tower Rooms

Parallel Oral Sessions

15.30	SESSION 4 Net zero energy pathways CHAIR: Professor Marco Mazzotti ETH Zürich Seminar room 121, SAF	SESSION 5 Data-centric chemical engineering and process systems engineering Molecular systems engineering CHAIR: Dr Carmelo Herdes University of Bath G16 LT, SAF	SESSION 6 Sustainable and efficient chemical processes CHAIR: Professor Mark Simmons University of Birmingham G34 LT, SAF
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17.00–18.30 **POSTER SESSION 1** – Queen's Tower Rooms

18.50 Coach transport to social event from Prince Consort Road

19.15–22.30 Evening social event – **Under The Bridge Sports Bar, Chelsea Football Club**

Day 2: Friday 26 April 2024

09.00

PLENARY II

Engineered proteins for diagnostics in Low Income Countries

Professor Lisa Hall, University of Cambridge

CHAIR: Professor Karen Polizzi, Imperial College London

G16 LT, SAF

Parallel Oral Sessions

10.00

SESSION 7

Biotechnology

CHAIR: Professor Gary Lye

University College London

Seminar Room 121, SAF

SESSION 8

Data-centric chemical engineering and process systems

Sustainable and efficient chemical processes

CHAIR: Dr Miao Guo

King's College London

G34 LT, SAF

SESSION 9

Sustainable and efficient chemical processes

CHAIR: Dr Melis Duyar

University of Surrey

G16 LT, SAF

11.00

Refreshment Break – Queen's Tower Rooms

Parallel Poster Flash Sessions – see page 15

11.30

SESSION 10

Biotechnology

Net zero energy pathways

Chemical Engineering education

CHAIR: Professor Grazia de Angelis, University of Edinburgh

Seminar Room 121, SAF

SESSION 11

Data-centric chemical engineering and process systems engineering

Molecular systems engineering

CHAIR: Dr Solomon Bawa
University College London

G34 LT, SAF

SESSION 12

Sustainable and efficient chemical processes

CHAIR: Professor Qiong Cai
University of Surrey

G16 LT, SAF

12.30–14.00

LUNCH & POSTER SESSION 2 – Queen's Tower Rooms

Parallel Oral and Panel Discussion Sessions

14.00–16.00

SESSION 13

Translating Chemical Engineering: from research to societal impact

CHAIR: Professor Camille Petit
Imperial College London

G16 LT, SAF

SESSION 14

Integrating sustainability best practices into Chemical Engineering curriculum

CHAIRS:

Dr Michaela Pollock, University College London
Dr Umang Shah, Imperial College London

G34 LT, SAF

16.00

Prizes and closing remarks – G16 LT, SAF

16.30

Depart

Day 1 Parallel Oral Sessions

Session 1 Net Zero Energy Pathways – Seminar room 121, SAF

Time Oxford
Abstract ID

14.00	14	A roadmap for large-scale deployment of sorbent-based direct air capture integrated at UK industrial clusters <u>Adam Ward</u> , Steven Sachio, Max Bird, Maria Papathanasiou, Ronny Pini, Imperial College London
14.10	95	Application of superstructure optimisation for techno-economic assessment of dual-function materials for direct air capture and utilisation <u>Meshkat Dolat</u> , Melis S. Duyar, Michael Short, University of Surrey
14.20	32	The role of renewables in achieving net zero in China's electricity sector: An environmental assessment <u>Tingfeng Song</u> , Harish K. Jeswani, Adisa Azapagic, University of Manchester
14.30	193	Towards sustainable urban energy management: integrating dynamic thermal energy storage and advanced demand forecasting <u>Mohammadamin Zarei</u> ¹ , Chul-Jin Lee ² , Michael Short ¹ , ¹ University of Surrey, ² Chung-Ang University
14.40	129	Prosumer bidding strategies for effective power trading in local energy markets <u>Ioanna Kalospyrou</u> , Timothy Huddy, Solomon Brown, University of Sheffield

Session 2 Data-Centric Chemical Engineering and Process Systems Engineering – G16 LT, SAF

14.00	257	Using explainable AI to predict drop coalescence under confinement <u>Jinwei Hu</u> ¹ , <u>Kewei Zhu</u> ² , <u>Sibo Cheng</u> ¹ , Nina Kovalchuk ³ , Alfred Soulsby ³ , Mark Simmons ³ , Omar Matar ¹ , Rossella Arcucci ¹ , ¹ Imperial College London, ² University of York, ³ University of Birmingham
14.10	170	Using machine learning to generate a surrogate model for a fluid-bed granulation process <u>Eleanor Hussey</u> ¹ , Rachel Smith ¹ , James Litster ¹ , John Silverthorne ² , ¹ University of Sheffield, ² Syngenta
14.20	134	Machine learning-driven feasibility enclosure for operational enhancement and optimization of ibuprofen crystallization in automated continuous flow platforms <u>Arun Pankajakshan</u> , Sayan Pal, Maximilian Besenhard, Asterios Gavriilidis, Luca Mazzei, Federico Galvanin, University College London
14.30	241	Improving porous formulation performance through data-driven analysis <u>Jack I'Anson</u> ^{1,2} , Mark Simmons ¹ , Hugh Stitt ² , Robert Gallen ² , ¹ University of Birmingham, ² Johnson Matthey
14.40	179	Thermal environment modelling in greenhouse by using a physics-informed recurrent neural network <u>Jinqi Yang</u> , Tao Chen, University of Surrey

Session 3 Biotechnology – G34 LT, SAF

14.00	187	Standardizing and streamlining the manufacturing of virus-like particles and protein nanoparticles as scaffold proteins for vaccine applications <u>Nur Azizah Fitria</u> ¹ , Kanya Citta Hani Alifia ¹ , Wei Wu ¹ , Timothy Sugito ² , Catur Riani ² , Kang Lan Tee ¹ , Tuck Seng Wong ¹ , ¹ University of Sheffield, ² Bandung Institute of Technology
14.10	214	Translational potential of tissue plasminogen activator loaded cell membrane-derived nanovesicles to treat cardiovascular diseases <u>Nicole Henry</u> ¹ , Yu Huang ² , Isabelle Salles-Crawley ¹ , Mike Emerson ¹ , Colin Longstaff ³ , Rongjun Chen ¹ , ¹ Imperial College London, ² Shanghai Jiao Tong University Affiliated Sixth People's Hospital, ³ NIBSC
14.20	5	Time for a new home? nature inspired 3d scaffolds to improve cell culturing environments for cancer immunotherapy <u>Lucy Todd</u> , Matthew Chin, Marc-Olivier Coppens, University College London
14.30	198	Bio-inspired design and manufacturing of micro devices and testing platforms for sustainable bioelectronics <u>Berjau Officer</u> ^{1,2,3} , Iliaria Francescon ^{1,3} , Surajit Kar ^{1,2,3} , Ming Xu ^{1,3} , Fernando Castro ² , Patrizia Camelliti ³ , <u>Yunlong Zhao</u> ^{1,2} , ¹ Imperial College London, ² National Physical Laboratory, ³ University of Surrey
14.40	228	Room air purification using a novel closed ultraviolet-c device <u>Eldad Avital</u> ¹ , Abdus Samad ² , Nithya Venkatesan ³ , Fariborz Motallebi ¹ , Clive Beggs ⁴ , ¹ Queen Mary University of London, ² IIT Madras, ³ VIT Chennai, ⁴ Leeds Beckett University

Time	Oxford Abstract ID	
Session 4 Net Zero Energy Pathways – Seminar room 121, SAF		
15.30	281	Best innovations are through robust collaborations Geetha Srinivasan, Khalik Mohamad Sabil, Bishop Falope, Rahim Masoudi, Ian Ballard, PETRONAS
15.50	42	UK-HyRES: A UK hub for sustainable hydrogen energy research Tim Mays ¹ , Rachael Rothman ² , Shanwen Tao ³ , ¹ University of Bath, ² University of Sheffield, ³ University of Warwick
16.10	27	Sustainability assessment of “solar” hydrogen production considering different configurations of photovoltaics-grid-battery systems in China Xiaoyu Huang, Adisa Azapagic, Harish K. Jeswani, University of Manchester
16.20	61	How economically viable and environmentally sustainable are drop-in aviation fuel from CO₂? Andrea Bernardi ¹ , David Danaci ¹ , Andrew Symes ² , Benoit Chachuat ¹ , ¹ Imperial College London, ² OXCCU Tech Ltd
16.30	131	Igniting hydrogen: unveiling combustion dynamics in fluidised beds of inert silica sand Yujia Wang, Ewa Marek, University of Cambridge
16.40	283	Advancing the knowledge on semicrystalline polymers for hydrogen storage and handling Grazia De Angelis ^{1,2} , Eleonora Ricci ^{1,2} , Enzo Mangano ^{1,2} , Riccardo Rea ^{1,2} , Omar Atiq ^{1,2} , Lorenzo Merlonghi ^{3,2} , Marco Giacinti ^{3,2} , ¹ University of Edinburgh, ² DPI, The Netherlands, ³ University of Bologna
Session 5 Data-Centric Chemical Engineering and Process Systems Engineering Molecular Systems Engineering – G16 LT, SAF		
15.30	33	Advancing the description of induction in hybrid ab initio/force-field models for crystal structure prediction Benjamin Tan ¹ , Yizu Zhang ² , David Bowskill ³ , Adam Keates ³ , Constantinos Pantelides ¹ , Claire Adjiman ¹ , ¹ Imperial College London, ² XtalPi Inc., ³ Syngenta
15.40	189	Multiobjective Bayesian optimization with aleatoric uncertainty for nanomaterial synthesis Karim Kristian Ben Hicham ^{1,2} , Nicholas José, Alexei Lapkin ² , ¹ RWTH Aachen University, ² Cambridge Centre for Advanced Research & Education in Singapore Ltd
15.50	186	A continuum approach to model detergent powder flow Retief Lubbe ^{1,2} , Prashant Gupta ¹ , Vanessa Magnanimo ² , ¹ Procter & Gamble, ² University of Twente
16.00	279	Computational fluid dynamics mixing modelling in a non-standard batch vessel to reduce impurity formation in complex Active Pharmaceutical Ingredient (API) manufacture Ella Allison-Drake, Astra Zeneca
16.10	128	How can we leverage inexpensive simulations for the optimisation of complex liquid-jet atomisation? Nausheen Basha ¹ , Thomas Savage ¹ , Thomas Abadie ² , Konstantinos Zinelis ¹ , Ehecatl Antonio del Rio Chanona ¹ , Omar K. Matar ¹ , ¹ Imperial College London, ² University of Birmingham
16.20	98	A world of pure imagination? Better understanding the dynamics of vertical stirred mills within chocolate processing Daniel Rhymer, Andy Ingram, Kit Windows-Yule, University of Birmingham
16.30	197	Industry 4.0 vibration-based damage detection method for saggars Siddhant Naudiyal ^{1,2} , Richard Greenwood ² , Paul Bowen ² , Mark Simmons ² , Hugh Stitt ¹ , Aswani Mogalicherla ¹ , ¹ Johnson Matthey, ² University of Birmingham
16.40	66	Adversarially robust real-time optimization and control with adaptive Gaussian process learning Akhil Ahmed, Ehecatl Antonio del Rio-Chanona, Mehmet Mercangoz, Imperial College London
Session 6 Sustainable and Efficient Chemical Processes – G34 LT, SAF		
15.30	74	Coupling of microfluidics and dynamic light scattering for sustainable solution engineering Luis M. G. Torquato ¹ , Nelson Hélaïne ² , Yufan Cui ¹ , Roisin O’Connell ¹ , Jérémie Gummel ³ , Eric S. J. Robles ³ , João T. Cabral ¹ , ¹ Imperial College London, ² Université Paul Sabatier, ³ Procter & Gamble
15.40	206	Investigation of intensified extractions using small channel contactors Malik Olasinde, Yiota Victoria Phakoukaki, Charlotte Pheasey, Angeli Panagiota, University College London
15.50	83	Predicting the particle size distribution of silver nanoparticles synthesised in a well-mixed reactor and a microfluidic device: coupled PBM-CFD simulations and experiments Paula Pico ¹ , Konstantia Nathanael ² , Alessio Lavino ¹ , Nina Kovalchuk ² , Mark Simmons ² , Omar Matar ¹ , ¹ Imperial College London, ² University of Birmingham

Time	Oxford Abstract ID	
16.00	261	Hydrodynamics investigation of miniaturised CSTRs and their application for continuous iron oxide nanoparticle synthesis <u>Georgios Gkogkos</u> , Emilio E. Kahil, Liudmyla Storozhuk, Nguyen T. K. Thanh, Asterios Gavriilidis, University College London
16.10	123	Environmentally conscious composite microcapsules with superior mechanical properties for potential applications in fast-moving consumer goods Dan Baiocco ¹ , Benjamin Lobel ² , Mohammed Al-Sharabi ³ , Olivier J. Cayre ² , Alexander F. Routh ³ , Zhibing Zhang ¹ , ¹ University of Birmingham, ² University of Leeds, ³ University of Cambridge
16.20	100	Food phantom packaging: engineering microstructure-integrated edible packaging for more sustainable consumer foods <u>Luc Dewulf</u> ¹ , Michael Hausmann ² , Annabel Bozon ² , Agba Salman ¹ , ¹ University of Sheffield, ² Nestlé
16.30	160	Optimising sustainable plastics for food packaging films <u>Nisha Middleton</u> , Karen Johnston, Paul Mulheran, University of Strathclyde
16.40	119	Modelling of plastic melting & devolatilization in fluidised beds: a computational fluid-particle dynamics (CPFD) approach <u>Oluwatobiloba Henry</u> , University of Birmingham

Day 2 Parallel Oral Sessions

Session 7 Biotechnology – Seminar Room 121, SAF

Time	Oxford Abstract ID	
10.00	152	Dynamics of chromatin-bound transcriptional condensates in response to RNA gradients <u>David David</u> ^{1,2} , Deepti Kannan ¹ , Pradeep Natarajan ¹ , Andriy Goychuk ¹ , Arup K. Chakraborty ¹ , ¹ Massachusetts Institute of Technology, ² Imperial College London
10.10	218	Engineering functional hydrogel based artificial cells <u>Matthew Allen</u> , James Hindley, Oscar Ces, Yuval Elani, Imperial College London
10.20	268	Optimisation and characterisation of a 250 mL continuous bioreactor for the culture of mammalian cells <u>Ciara Lucas</u> ¹ , Martina Micheletti ¹ , David Mainwaring ² , ¹ University College London, ² Cytiva
10.30	225	Rapid model development and parameter estimation for the design of a lignocellulosic mycoprotein fermentation process <u>Mason Banks</u> , Miao Guo, King's College London
10.40	12	Exploring the symbiotic dance: the impact of marine shipping pollution on algae-bacteria communities and opportunities for remediation <u>Amy Birss</u> , University of Sheffield, A* Institute, Singapore

Session 8 Data-Centric Chemical Engineering and Process Systems Engineering Sustainable and Efficient Chemical Processes – G34 LT, SAF

10.00	58	An enviro-economic assessment of municipal solid waste gasification for circular chemical production <u>Ben Lyons</u> , Saxon Stanley, Andrea Bernardi, Benoit Chachuat, Imperial College London
10.10	244	Global sensitivity analysis in life-cycle assessment of an integrated ibuprofen manufacturing process <u>Shang Gao</u> , Brahim Benyahia, Loughborough University
10.20	274	Leveraging lifecycle assessment for sustainable decision-making: case studies of cellulose nanocrystals (CNC) production in renewable vs. fossil fuel-dependent regions <u>Zhimian Hao</u> ¹ , Wadood Hamad ² , Polina Yaseneva ¹ , ¹ University of Cambridge, ² Seprify AG
10.30	159	Forecasting process faults using k-nearest neighbours' algorithm in a reactive absorption case study <u>Yasser Algoufily</u> ^{1,2} , Mehmet Mercangoz ¹ , ¹ Imperial College London, ² SABIC
10.40	265	Real-world implementation of advanced control retrofits in commercial buildings <u>Max Bird</u> , Salvador Acha, Nilay Shah, Imperial College London

Time	Oxford Abstract ID	
Session 9 Sustainable and Efficient Chemical Processes – G16 LT, SAF		
10.00	40	Biomass-derived single atom catalysts for oxygen reduction Lorenzo Mazzoli, Angus Pedersen, Simon Kellner, Robert Hunter, Jesus Barrio , Imperial College London
10.10	219	Advancing climate mitigation: exploring CaO/ZnO adsorbent for effective CO₂ capture and sustainable chemical production Ali Goksu ¹ , Tomas Ramirez Reina ² , Melis Duyar ¹ , ¹ University of Surrey, ² University of Seville
10.20	24	Lignin-derived mesoporous carbon for sodium-ion batteries Chantal Glatthaara ^{1,2} , Mengnan Wang ¹ , Magda Titirici ¹ , Bernd Smarsly ² , ¹ Imperial College London, ² Justus-Liebig University
10.30	71	Photocatalytic hydrogen production through photoreforming of organic species: microkinetics and experimental validation Ruiman Ma ¹ , Matthew Wigglesworth ¹ , Marica Muscetta ² , Natalia Martsinovich ¹ , Sergio Vernuccio ¹ , ¹ University of Sheffield, ² University of Naples Federico II
10.40	164	Exploring metal-oxides as oxygen carriers for chemical looping ethylene epoxidation Xiaoyu Dai , Ewa Marek , University of Cambridge
10.50	73	Experimental investigation of La_{0.6}Sr_{0.4}FeO_{3-δ} pellets as oxygen carriers in a ‘chemical memory reactor’ for efficient chemical-looping CO₂ splitting Yongliang Yan , Wenting Hu , Matteo Fella , Ian Metcalfe , Newcastle University

SESSION 10		PARALLEL POSTER FLASH PRESENTATIONS – ORDER BY OXFORD ABSTRACT ID
Seminar Room 121, SAF		
Biotechnology	11*, 26*, 47*, 75*, 161*, 166*, 185*	
Net zero energy pathways	34*, 55*, 77*, 86*, 108*, 121*, 137*, 151*, 168*, 249*, 252*, 267*	
Chemical Engineering education	54*, 162*, 165*	

SESSION 11		PARALLEL POSTER FLASH PRESENTATIONS – ORDER BY OXFORD ABSTRACT ID
G34 LT, SAF		
Data-centric chemical engineering and process systems engineering	13*, 85*, 92*, 93*, 99*, 124*, 125*, 150*, 167*, 169*, 184*, 213*, 239*, 251*, 277*, 280*	
Molecular systems engineering	41*, 118*, 263*, 278*	

SESSION 12		PARALLEL POSTER FLASH PRESENTATIONS – ORDER BY OXFORD ABSTRACT ID
G16 LT, SAF		
Sustainable and efficient chemical processes	17*, 18*, 39*, 43*, 45*, 53*, 64*, 90*, 111*, 116*, 122*, 130*, 133*, 171*, 188*, 211*, 217*, 226*, 234*, 262*, 266*	

Session 13**Translating Chemical Engineering From a Research to Societal Impact – G16 LT, SAF**

14.00– 14.40		Keynote: From bench to impact – academic and industry perspectives on translation Dr Christian Holtze, BASF Professor Sandro Macchietto, Imperial College London
14.40– 15.30		Panel discussion MODERATOR: Dr Christian Holtze PANELLISTS: Professor David Fairen-Jimenez, University of Cambridge Dr Helen (Jingui) Liang, Labcycle Dr Mark Selby, CERES Power Dr Rob Singh, University of Essex Ms Andrea Sinclair, Angel Investor Mr Paul Swift, P&G
15.30	70	New biorefinery approach for the production of new biobased high-performance surfactants for home and personal care applications Perrakis Bistis, Bioataraxis Ltd, Imperial College London
15.37	155	Solving the scale-up challenge for advanced materials Nicholas Jose, Accelerated Materials Ltd, University of Cambridge, Cambridge Centre for Advanced Research and Technology in Singapore
15.44	253	EvoPhase: revolutionising industrial processes with AI and simulations Dominik Werner, University of Birmingham

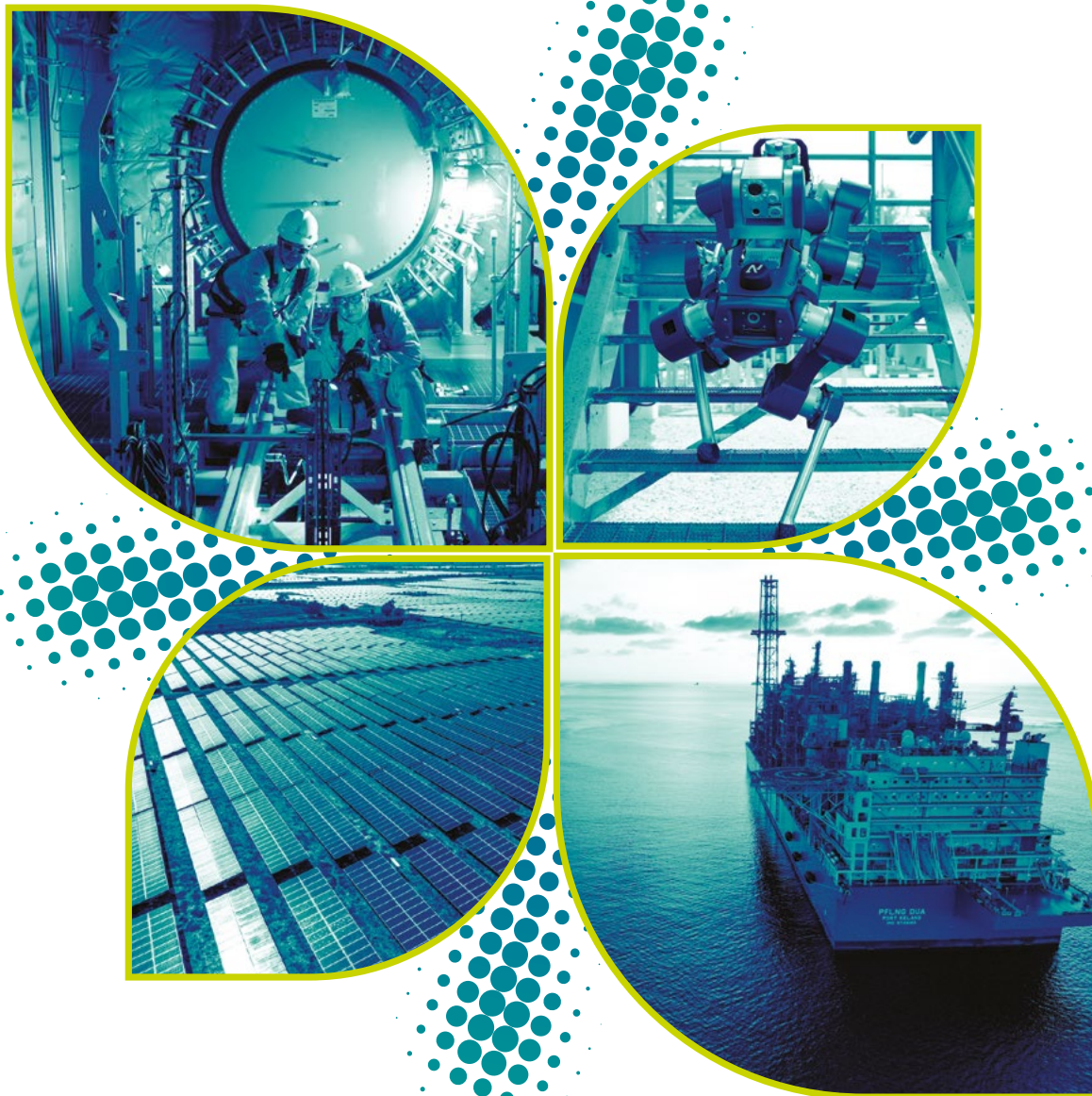
Session 14**Integrating Sustainability Best Practices Into Chemical Engineering Curriculum – G34 LT, SAF**

14.00– 14.30		Keynote: Sustainability in chemical engineering education – are we making an impact? Professor Jarka Glassey, Newcastle University
14.30	223	Navigating the divide: bridging the gap between academic training and industry demands for employability skills and sustainable development in chemical engineering Maryam Malekshahian, Salman Shahid, Jessica Dautelle, Wennie Subramonian, University of Manchester
14.40	156	How we are kickstarting: embedding sustainability knowledge into the chemical engineering curriculum Wennie Subramonian, Maryam Malekshahian, Krithikaa Thamilselvan, University of Manchester
14.50	23	Analysing sustainability learning outcomes and their integration in the UK chemical engineering curriculum Manoj Ravi, University of Leeds
15.00	174	Promoting resource management in teaching laboratories: a case study for effective implementation of sustainable practices Mohamed Maher, Umang Shah, Imperial College London
15.10– 16.00		Panel discussion: Integrating sustainability best practices into ChemEng curriculum MODERATOR: Professor Nilay Shah, Imperial College London PANELLISTS: Professor Jonathan Seville, University of Birmingham Professor Jarka Glassey Vivien Thurner, Newcastle University, IChemE Education Group Student Representative



Posters

Innovating Beyond Energy



We stand at the forefront of change, steadfast in delivering solutions on our Pathway to NZCE 2050.

At PETRONAS, we relentlessly harness cutting-edge technology to propel us forward in our quest for a lower-carbon future.

It's not just about what we do today but how we pave the way for a sustainable tomorrow.

Posters

*Asterisks indicate contributions selected for poster flash presentations

Day 1 Poster Session: 25 April | 17.00 | Queen's Tower Rooms

Poster Board number Oxford Abstract ID no. POSTER TOPICS AND TITLES

Data-Centric Chemical Engineering and Process Systems Engineering

1	8	Towards an integrated wide approach for sustainable upstream field recovery Shakeel Ramjane, Imperial College London
2	16	Improved formulation of high-resolution finite volume schemes for the solution of crystallisation population balance models Daniele Pessina, Jerry Y.Y. Heng, Maria Papatthanasidou, Imperial College London
3	28	Data information integrated neural network (DINN) algorithm: interpretable machine learning by incorporating correlation information Waqar Ashraf, Vivek Dua, University College London
4	30	Predicting the hydrodynamics of stirred tanks in the transitional flow regime Georgina Wadsley ^{1,2} , David F. Fletcher ³ , Andy Ingram ¹ , Joelle Aubin ² , Waldo Rosales ⁴ , Mark J. Simmons ¹ , ¹ University of Birmingham, ² Laboratoire de Génie Chimique, ³ University of Sydney, ⁴ Unilever R&D
5	49	AI-enabled model predictive control of an enhanced-weathering-based CO₂ capture process Lei Xing ¹ , Oliver Fisher ² , Jin Xuan ¹ , ¹ University of Surrey, ² University of Nottingham
6	63	AI-Driven urban carbon monitoring systems for enhanced energy sustainability Uchechukwu Nwaiwu, Abia State University Uturu
7	65	Development and validation of a digital twin for the ABB-Imperial College London carbon capture pilot plant Siyu Guo, Imperial College London
8	69	Simulation capabilities for industrially relevant particle-laden flows A. Alghamdi ¹ , I. Mohammed ¹ , T. Abadie ^{1,2} , O. Matar ¹ , ¹ Imperial College London, ² University of Birmingham
9	89	Direct numerical simulations of surfactant-laden interfaces with a moving contact line Debashis Panda ¹ , Lyes Kahouadji ¹ , Seungwon Shin ² , Jalel Chergui ³ , Damir Juric ³ , Omar Matar ¹ , ¹ Imperial College London, ² Hongik University, ³ LISN-CNRS
10	91	Integrating sustainability in next-generation biopharmaceutical supply chains Miriam Sarkis, Alasdair Fyfe, Andrea Bernardi, Nilay Shah, Maria M. Papatthanasidou, Imperial College London
11	94	Tecno-environmental analysis and optimization of diesel production with carbon dioxide, water and heat closed loops Grazia Leonzio ^{1,2} , Niki Triantafyllou ² , Nilay Shah ² , ¹ University of Cagliari, ² Imperial College London
12	102	Data driven method using powder characterisation tools to calibrate simulations of granular systems Ben Jenkins ^{1,2} , Leonard Nicusan ¹ , Geoffroy Lumay ³ , Aurelien Neveu ² , Filip Francqui ² , Jonathan Seville ¹ , Kit Windows-Yule ¹ , ¹ University of Birmingham, ² Granutools, ³ University of Liege
13	104	Simulation of blood flow in a network of blood vessels Guanqi Wang, Thomas Abadie, Ivan Wall, Patricia Pérez Esteban, University of Birmingham
14	113	Evaluating the impact of salt precipitation on electrochemical CO₂ reduction via multi-physics modeling Yuanjing Zhao, Lei Xing, Jin Xuan, Wei Zhang, University of Surrey
15	158	Developing methods for big data capture in support of the digital twin for investment casting shelling operations Rahul Suresh Arath ¹ , Christopher Windows Yule ¹ , Stewart Welch ² , ¹ University of Birmingham, ² Rolls Royce plc
16	205	Integrated site-wide scheduling and operation optimisation of anaerobic digestion for sustainable local bioenergy Meshkat Dolat ¹ , Rohit Murali ¹ , Mohammadamin Zarei ¹ , Dongda Zhang ² , Jhuma Sadhukhan ¹ , <u>Michael Short</u> ¹ , ¹ University of Surrey, ² University of Manchester

Poster Board number	Oxford Abstract ID number.	POSTER TOPICS AND TITLES
17	215	Distinguishing alternative kinetic models for hydrogen borrowing within the model-based design of experiment framework for model discrimination <u>Emmanuel Agunloye¹, Panagiotis Petsagkourakis¹, Ricardo Labes², Thomas Chamberlain², Frans Muller², Richard Bourne², Federico Galvanin¹, ¹University College London, ²University of Leeds</u>
18	222	Discrete element method as a digital tool to deliver built-in quality assurance for pharmaceutical formulations <u>Mithushan Soundaranathan, Jiayu Liu, Brahim Benyahia, Loughborough University</u>
19	236	Enhancing biogas production forecasting with LSTM <u>Rohit Murali, Michael Short, Tao Chen, University of Surrey</u>
20	247	Screening of surfactant irritation potential of novel surfactants by means of molecular simulation and machine learning <u>Harry Cardenas¹, Erich Müller¹, Omar Matar¹, Sara Shahrudin², ¹Imperial College London, ²Specialty Chemical Technology, PETRONAS Research Sdn Bhd</u>
21	282	Mixing dynamics of multiple shaft, multiple impeller (MSMI) stirred tanks for newtonian fluids in the laminar regime <u>Darius Khoshdel¹, Mark Simmons¹, Andrew Ingram¹, Thomas Abadie¹, Waldo Rosales Trujillo², ¹University of Birmingham, ²Unilever</u>

Net Zero Energy Pathways

22	15	A hybrid system for capturing CO₂ directly from the air <u>Kleio Aikaterini Zervidi, Martin Trusler, Camille Petit, Ronny Pini, Imperial College London</u>
23	19	Investigating the activity of Ca₂Fe₂O₅ additives on the thermochemical energy storage performance of limestone waste <u>Rehan Anwar¹, Rajani K. Vijayaraghavan², Patrick J. McNally², Maria Myrto Dardavila^{3,1}, Epaminondas Voutsas³, M. Veronica Sofianos¹, ¹University College Dublin, ²Dublin City University, ³National Technical University of Athens</u>
24	25	Impact of design and operational parameters on the performance of a rotary adsorber for carbon capture <u>Lucy Barton, Ronny Pini, Camille Petit, Imperial College London</u>
25	35	Modelling heat conduction and generation in 3D composite cathode microstructures of all-solid-state li-metal batteries <u>Juan Huang, Duo Zhang, Jiawei Hu, Charley Wu, Qiong Cai, University of Surrey</u>
26	52	Enhancing hydrogen production for net zero emissions in Nigeria through modified TiO₂ photocatalyst & NBSP <u>Omejeh Timothy Enejoh, Teesside University</u>
27	67	Optimising the environmental impacts and process efficiency in CO₂ capture technology through an AI-enabled optimisation framework <u>Xin Yee Tai¹, Oliver Fisher², Lei Xing¹, Jin Xuan¹, ¹University of Surrey, ²University of Nottingham</u>
28	72	An optimisation model for the design of multi-modal CO₂ transportation in carbon capture and storage supply chain <u>Fengyuan Zhang, Elena Catalanotti, Sergey Martynov, Richard Porter, Haroun Mahgerefteh, University College London</u>
29	97	Improving the capture capacity of dual function materials: a step ahead on CO₂ capture and hydrogenation <u>Soudabeh Bahrami Gharamaleki¹, Tomas Ramirez Reina², Melis S Duyar¹, ¹University of Surrey, ²University of Seville</u>
30	103	Dynamic modelling of the deuterium-tritium (DT) fusion fuel cycle to develop a framework for pressure relief system design <u>Emma Barrow¹, Iryna Bennett², Franjo Cecelja¹, Eduardo Garciadiego-Ortega², Megan Thompson², Dimitrios Tsaoulidis¹, ¹University of Surrey, ²UK Atomic Energy Authority</u>
31	112	Atomic-scale design of metal anodes for next-generation solid-state batteries <u>Neubi Xavier, Qiong Cai, University of Surrey</u>
32	114	Experimental studies on the kinetics of olivine dissolution in CO₂ saturated water under reservoir conditions <u>Qiaoyun Chen, J. P. Martin Trusler, Imperial College London</u>
33	143	Viscosity and density of decane and hexylbenzene with dissolved carbon dioxide and/or methane <u>Iusiph Eiubovi, J.P. Martin Trusler, Imperial College London</u>
34	154	Thermodynamic analyses of a novel hydrogen production process via chemical looping integrated with sorption enhanced syngas reforming <u>Husain Bahzad^{1,2}, Grazia Leonzio^{2,3}, Paul Fennell², Abdullah AlJasmi¹, ¹Public Authority of Applied Education and Training, ²Imperial College London, ³University of L'Aquila</u>

Poster Board number	Oxford Abstract ID number.	POSTER TOPICS AND TITLES
35	157	Developing robust electrocatalysts for oxygen evolution in alkaline sea water electrolyzers (ASWEs) Ahmed Abido ¹ , Mary Ogie ¹ , Sumit Roy ² , Venkatesan Venkata Krishnan ¹ , ¹ Teesside University, ² Durham University
36	178	Net zero electricity network with concentrated solar power plants: production, distribution, and energy storage optimization considering techno-economic and social impacts Jose Antonio Luceño Sanchez ¹ , Mariano Martin ² , Sandro Macchietto ¹ , ¹ Imperial College London, ² University of Salamanca
37	194	Rational design and manufacturing of micro devices and testing platforms for net zero energy storage and future electronics Ming Xu ^{1,2} , Xuhui Yao ³ , Yi Gong ^{1,2} , Shaoyin Li ^{1,2} , Yunlong Zhao ^{1,3} , ¹ Imperial College London, ² University of Surrey, ³ National Physical Laboratory
38	204	Functional fluids for hydrogen production Christopher Kelly, Jillian Thompson, Stuart James, Queens University Belfast
39	212	Compact particle-based concentrated solar power system with fluidised bed heat exchanger for net zero energy Mustapha Hamdan ¹ , Malak Hamdan ² , Tao Chen ¹ , Dimitrios Tsaoulidis ¹ , ¹ University of Surrey, ² Vector Sustainable Energy
40	231	How green is biogas? Luke Dubey, Maria Olczak, Paul Balcombe, Queen Mary University of London
41	242	Inter-seasonal compressed air electricity storage: what are the options? Paul Sapin, Anais Mercier-Willmann, Tim Green, Christos N. Markides, Imperial College London
42	254	Transport properties of pure fluids and mixtures using residual entropy model Malyanah Binti Mohd Taib ^{1,2} , Martin Trusler ¹ , ¹ Imperial College London, ² Universiti Malaysia Pahang Al-Sultan Abdullah
43	260	High temperature co-electrolysis in 'assisted' mode – partial oxidation of bio-methane at the anode Joshua Brennan, Venkatesan Venkata Krishnan, Teesside University

Sustainable and Efficient Chemical Processes

44	9	Effect of temperature on g-C₃N₄ photocatalytic activity and NMR surface relaxation Jiaye Shao, Carmine D'Agostino, University of Manchester
45	10	The effect of salinity on Exo-polysaccharides (EPS) productivity towards algal bioplastics Norzuria Bahari, Vaidyanathan Seetharaman, University of Sheffield
46	31	Process automation development of 3D printed microfactories Entvin Mamo, Steven Ferguson, University College Dublin
47	36	Comparative study of commercial and custom synthesis approaches to enhancing the mechanical properties of PDMS Abdulraheem A. Alrefai ¹ , Alessandra Petrol ² , Steve. J Bull ¹ , Mark Geoghegan ¹ , ¹ Newcastle University, ² University of Bologna
48	37	Brewing up solutions: developing high-performance adsorbents from spent coffee ground waste for post-combustion carbon capture Elliot Ross, Ashleigh Fletcher, University of Strathclyde
49	38	Spherical agglomeration kinetics: a mechanistic approach Kate Pitt ¹ , Jonathan Tew ¹ , Bilal Ahmed ² , Cameron Brown ² , Ian Houson ² , James Litster ¹ , Rachel Smith ¹ , ¹ University of Sheffield, ² University of Strathclyde
50	48	Development of new sustainable adhesives promoting recycling using reversible polyelectrolyte adhesion Bassam Aljohani, Mark Geoghegan, Katarina Novakovic, Volker Pickert, Adriana Sierra-Romero, Newcastle University
51	56	Reducing CO₂ resulting from the calcination of CaCO₃ in cement production Franco Williams, Aidong Yang, University of Oxford
52	57	Enhanced wetting and spreading promoted by novel branched surfactants Nina Kovalchuk ¹ , Masanobu Sagisaka ² , Hinata Komiyama ² , Mark Simmons ¹ , ¹ University of Birmingham, ² Hirosaki University
53	59	A review of problems and methods of optimising sensor grids for CO₂ pipeline transport networks Teke Xu, Sergey Martynov, Haroun Mahgerefteh, University College London
54	68	Multiplexed microfluidic setup for high throughput emulsification quantification with surfactant solutions Zain Ahmed, Gunjan Tyagi, Luis Torquato, João Cabral, Imperial College London

Poster Board number	Oxford Abstract ID number.	POSTER TOPICS AND TITLES
55	78	Bioinspired synthesis and synthesis–structure–performance relationship of zinc oxide photocatalysts for sustainable hydrogen production Gareth Williams ¹ , Alhassan Mohammed ¹ , Marica Muscetta ² , Sergio Vernuccio ¹ , ¹ University of Sheffield, ² University of Naples Federico II
56	80	Moisture-breathing composite beds for adsorption/solar energy-driven air conditioning Joshua Nicks ¹ , Carmelo Herdes ¹ , Barry Crittenden ¹ , Jing Li ² , Chang Zhou ² , Xudong Zhao ² , Semali Perera ¹ , ¹ University of Bath, ² University of Hull
57	81	Utilizing surface wrinkles as a robust micropattern for antibacterial applications Hisayama, Hui Mao, João Cabral, Imperial College London
58	82	Extraction and separation of platinum group metals using deep eutectic solvents Sahar Gholami, Carmine D'Agostino, Jesus Esteban Serrano, University of Manchester
59	96	Probing carbon black deagglomeration in lithium-ion battery cathode manufacturing using powder resistivity metrics Guo Jung Lian ¹ , Prateek Verma ² , Denis Cumming ^{1,3} , Rachel Smith ^{1,3} , ¹ University of Sheffield, ² University of Leeds, ³ The Faraday Institution
60	107	Direct numerical simulations of miscible and immiscible displacements in pipelines for product changeover Abdullah Abdal ¹ , Lyes Kahouadji ¹ , Seungwon Shin ² , Jalel Chergui ³ , Damir Juric ^{3,4} , Omar Matar ¹ , ¹ Imperial College London, ² Hongik University, ³ Centre National de la Recherche Scientifique, ⁴ University of Cambridge
61	110	AI-based energy management system for carbon dioxide electrolyser Jiahao Mao, University of Surrey
62	117	Coarse-grained models for frontal photopolymerisation for non-planar material assembly Muhammad Ghifari Ridwan ¹ , Alessandra Vitale ² , João T. Cabral ¹ , ¹ Imperial College London, ² Politecnico di Torino
63	135	Application of (Ti/Zn)-Fe-Si solid acid metal oxide nanocatalysts for conversion of low-grade waste cooking oil to biodiesel Brandon Lowe, Ali Hassanpour, Hu Li, University of Leeds
64	138	Tools to be sustainable: life cycle assessment and carbon accounting James Condliffe, Heidi ElSayed, Bryony Borrowdale, Sandra Chauruka, Hanta Rabarjoelina, Centre for Process Innovation
65	144	Synthesis of ZnS nanowires for photoelectrochemical C-H bond activation of methanol Yuming Zhang, Klaus Hellgardt, Imperial College London
66	180	Towards an absolute environmentally sustainable economy within planetary boundaries – a UK case study Qiang Yang, Andrea Paulillo, University College London
67	182	Hydrophobic polyamide nanofilms provide rapid transport for crude oil separation Siyao Li ¹ , Ruijiao Dong ¹ , Valentina-Elena Musteata ² , Jihoon Kim ¹ , Neel Rangnekar ³ , J. R. Johnson ³ , Bennett Marshall ³ , Stefan Chisca ³ , Jia Xu ⁴ , Scott Hoy ³ , Benjamin McCool ³ , Suzana Nunes ² , Zhiwei Jiang ⁵ , Andrew Livingston ⁵ , ¹ Imperial College London, ² King Abdullah University of Science and Technology, ³ ExxonMobil Research and Engineering, ⁴ Ocean University of China, ⁵ Queen Mary University of London
68	183	Conversion of CO₂ to methanol using homogeneous frustrated lewis pair catalysts Ines Perez Tabarnero, Chris Tighe, George Britovsek, Andy Ashley, Imperial College London
69	202	PET waste as a sustainable feedstock for polyurethane/polyurea MWCNT nanocomposites Gabriela Toader ¹ , Aurel Diacon ^{1,2} , Edina Rusen ² , Traian Rotariu ¹ , Florin Marian Dirloman ¹ , Adrian Rotariu ¹ , ¹ Military Technical Academy 'Ferdinand I', ² National University of Science and Technology Politehnica Bucharest
70	210	Crystal regeneration post-breakage: parametric study towards process optimisation Deniz Etit, Isha Bade, Jerry Y.Y. Heng, Imperial College London
71	216	Impact of particle size and shape distributions and solvent choice on filtration performance of crystallized products Oleksandr Prykhodko ¹ , William Hicks ² , Giulio Perini ² , Carlos Avendano ¹ , Ashwin Kumar Rajagopalan ¹ , ¹ University of Manchester, ² AstraZeneca
72	220	Enhancing hydrogen production via plasma-assisted gasification Hao Zhang, University College London
73	221	Physical properties and structures of aqueous solutions of Ionic Liquids Georgina Moss, Kyra Sedransk Campbell, University of Sheffield

Poster Board number	Oxford Abstract ID number.	POSTER TOPICS AND TITLES
74	229	Study of hollow agglomerate formation through mechanistic understanding during spherical agglomeration of battery materials <u>Jediah Capindale</u> ¹ , Kate Pitt ¹ , Will Dawson ² , Paul Shearing ³ , Denis Cumming ¹ , Rachel Smith ¹ , ¹ University of Sheffield, ² University College London, ³ University of Oxford
75	230	Under pressure: the influence of scratches on membrane performance <u>Oliver Tomes</u> , Ellie Lewis, James Campbell, Imperial College London
76	238	CarboNation: integrated carbon capture and usage via caustic-carbonate pathways <u>Joel Caragay</u> ¹ , Jonathan Lee ² , James Hendry ² , Darren Rhodes ³ , Simon Rowe ³ , ¹ P&G Newcastle Innovation Centre, ² Newcastle University, ³ Centre for Process Innovation
77	245	A new generation of activated carbon adsorbent microstructures <u>Ethan Grigor</u> , Joseph Carver, Edric Bulan, Stuart Scott, John Chew, Semali Perera, University of Bath
78	246	Prediction of droplet formation in a T-junction microchannel based on data-driven method <u>Chen Tang</u> ¹ , Loic Chagot ¹ , Ziqian Cheng ¹ , Maria Kalli ¹ , Dongbao Wang ^{1,2} , Panagiota Angeli ¹ , ¹ University College London, ² Jiangsu University
79	248	Understanding the dissolution and denaturation behaviour of nanoparticles generated from nuclear fuel debris <u>Yiwei Zhang</u> ^{1,2} , Cong Chao ¹ , Eric Fraga ¹ , Takehiko Tsukahara ² , Panagiota Angeli ¹ , ¹ University College London, ² Tokyo Institute of Technology
80	255	Catalysts to mitigate climate change: the design of optimal catalysts for biomanufacturing sustainable fuels <u>Smitha Gopinath</u> , Sergio Vernuccio, University of Sheffield
81	256	Use of analytical techniques in the study of an industrial metal-polymer surface segregation problem <u>Joshua Cunday</u> , Steve Bull, Mark Geoghegan, Newcastle University
82	258	Zeolite-supported single-atom catalysts (SACs) for alkyne semi-hydrogenation <u>Essa Alhashmi</u> , Klaus Hellgardt, Imperial College London
83	259	Minimising water consumption on the washing of dye-extracted fabrics <u>Antonio Ovejero-Pérez</u> , Nursyazana Mahzan, Humaira Mansuri, Aida R. Abouelela, Jason P. Hallett, Imperial College London
84	272	Enhancement of perfume deposition from powder detergent into fabrics <u>Pablo del Pozo Lorenzale</u> ¹ , Peter Fryer ¹ , Patricia Andreu ² , Carlos Amador ² , Zhenyu Jason Zhang ¹ , ¹ University of Birmingham, ² P&G
85	275	A new copper and sodium codoped graphitic carbon nitride catalyst for the photocatalytic degradation of persistent pollutants under visible light irradiation <u>Samuel Ashu Abey</u> , Antonio Exposito, Nuno Reis, Emma Emanuelsson Patterson, University of Bath
86	284	Extraction of precious metal from WPCBs (waste printed circuit boards) <u>Farid Aiouache</u> , <u>Zahra Ilkhani</u> , University of Lancaster

Biotechnology

87	4	Engineering a multi-compartment liposome on the nanoscale <u>Colin Pilkington</u> , Ignacio Gispert, Suet Chui, John Seddon, Yuval Elani, Imperial College London
88	51	Optimisation of electrophoretic separation techniques for the analysis of RNA based vaccines and therapeutics <u>George Muir</u> , Mark Dickman, Zoltan Kis, University of Sheffield
89	79	Impact of amino acid impurity on peptide crystallisation <u>Enshu Liang</u> ¹ , Hamish Mitchell ¹ , Vivek Verma ¹ , Mingxia Guo ¹ , Jerry Y.Y. Heng ^{1,2} , Emily Jeanette Guinn ³ , ¹ Imperial College London, ² Institute for Molecular Science and Engineering, ³ Eli Lilly
90	87	Increased hydrostatic pressure but not shear-stress leads to VE-cadherin internalisation: a blood vessel-on-chip microfluidic model of microvascular dysfunction <u>Pranav Vasanthi Bathrinathan</u> ¹ , Cara Anderton ¹ , Narutoshi George ¹ , Daniele Vigolo ² , Liam M. Grover ¹ , Mark J.H. Simmons ¹ , ¹ University of Birmingham, ² University of Sydney
91	88	In silico study on the contribution of the follicular route to dermal permeability of small molecules <u>Daniel Sebastia-Saez</u> , Guoping Lian, Tao Chen, University of Surrey

Poster Board number	Oxford Abstract ID number.	POSTER TOPICS AND TITLES
92	101	Development and optimisation of biomimetic extracellular matrix coatings for tissue integration of smart arteriovenous grafts Ben Cassidy ^{1,2} , Patricia Perez Esteban ^{1,2} , Liam Grover ^{1,2} , Thomas Emil Anderson ³ , Tobias Hedberg ⁴ , Martin Alm ⁵ , ¹ University of Birmingham, ² Healthcare Technologies Institute, ³ University of Southern Denmark, ⁴ Verigraft AB, ⁵ Biomodics APS
93	106	Recreating an in-vitro permeation study through an in-silico dermal model with realistic in-use conditions Benjamin Deacon ^{1,2} , Guoping Lian ^{2,1} , Tao Chen ¹ , ¹ University of Surrey, ² Unilever
94	115	Continuous production of excreted esters from engineered cyanobacteria Mohammad Redwanur Rahman, Klaus Hellgardt, Imperial College London
95	192	Increasing single-cell oil (SCO) production in Rhodotorula toruloides using adaptive laboratory evolution (ALE) Abdulatif Bamufleh, Kang Lan Tee, Tuck Seng Wong, University of Sheffield
96	196	Explainable predictions of wastewater treatment plant microbiome composition and performance Tom Vinestock, Miao Guo, Eric Dong, David Jiang, King's College London

Day 2 Poster Session: 26 April | 12.30 | Queen's Tower Rooms

Poster Board number Oxford Abstract ID no.

Biotechnology

1	11* session 10	Learning phenotype landscapes with sequence-to-expression models and mechanistic information Yuxin Shen, Grzegorz Kudla, Diego Oyarzún, University of Edinburgh
2	26* session 10	Sustainable agriculture: vertical farming, digital twin monitoring and bio-fertiliser; the future of farming? Natasha Vaccaro, Ernesto Hernandez, Canterbury Christ Church University
3	47* session 10	Development of nanopackaging with polymer-coated lipid nanoparticles using QCM-D Shuning Xiang, Apanpreet Kaur, Jerry Heng, Rongjun Chen, Imperial College London
4	75* session 10	Use of ghost particle velocimetry (GPV) to determine the flows within in-vitro models of microvascular collapse Stephanie Hallam, Pranav Vasanthi Bathrinarayanan, Zoe Schofield, Nina Kovalchuk, Mark Simmons, University of Birmingham
5	161* session 10	Evaluation of halomonas as a novel host organism for industrial biotechnology and establishment of a robust and controlled fermentation process Nur Bazilah Afifah Matussin, Lanqi Zhang, Marco P. C. Marques, Gary J. Lye, University College London
6	166* session 10	A scale-down fermentation platform for rapid evaluation of media components used in cultured meat applications Brandon Ma, University College London, Multus Biotechnology Ltd
7	185* session 10	Beyond the cold chain: novel virus-mimicking nanoparticles for enhanced RNA delivery and improved storage Yifan Liu ¹ , Xuhan Liu ^{1,2} , Zongyi Li ³ , Anna Blakney ¹ , Paul McKay ¹ , Jian Lu ³ , Robin Shattock ¹ , Rongjun Chen ¹ , ¹ Imperial College London, ² Shenzhen University General Hospital, ³ University of Manchester

Data-Centric Chemical Engineering and Process Systems Engineering

8	13* session 11	Quality by design for mRNA platform purification based on continuous oligo-dT chromatography Jixin Qu, Zoltán Kis, University of Sheffield
9	85* session 11	Physics-informed automated discovery of kinetic models Miguel Ángel de Carvalho Servia ¹ , Ilya Orson Sandoval ¹ , Klaus Hellgardt ¹ , King Kuok Hii ¹ , Dongda Zhang ² , Ehecatt Antonio del Rio Chanona ¹ , ¹ Imperial College London, ² University of Manchester
10	92* session 11	On the AI driven geometry optimisation of a stirred tank CFD model in laminar flow Roberto Hart-Villamil ¹ , Andy Ingram ¹ , Kit Windows-Yule ¹ , Andrei L. Nicuşan ¹ , Santoshkumar Gupta ² , Waldo Rosales ³ , Adam Kowalski ³ , ¹ University of Birmingham, ² Hindustan Unilever R&D, ³ Unilever R&D Port Sunlight Lab
11	93* session 11	Characteristics of liquid dispersions in milli-channels using ultrasound techniques Fria Hossein, Duan Cong, Panagiota Angeli, University College London

Poster Board number	Oxford Abstract ID number.	POSTER TOPICS AND TITLES
12	99* session 11	Human in the loop Bayesian optimisation for expert guided process improvement and exploratory decision making Tom Savage ^{1,2} , Ehecatl Antonio del Rio Chanona ¹ , ¹ Imperial College London, ² The Alan Turing Institute
13	124* session 11	Asserting phase stability using classifier surrogates in solvent mixture design problem Lifeng Zhang, Tanuj Karia, Gustavo Chaparro, Benoît Chachuat, Claire S Adjiman, Imperial College London
14	125* session 11	Application of LSTM recurrent neural networks for multiphase mixing performance prediction Fuyue Liang ¹ , Juan P. Valdes ¹ , Sibó Cheng ¹ , Lyes Kahouadji ¹ , Seungwon Shin ² , Jalel Chergui ³ , Damir Juric ^{3,4} , Rosella Arcucci ¹ , Omar K. Matar ¹ , ¹ Imperial College London, ² Hongik University, ³ Université Paris Saclay, ⁴ University of Cambridge
15	150* session 11	Data-driven modelling approaches for chromatographic separation processes Foteini Michalopoulou ^{1,2} , Maria M. Papanthanasidou ^{1,2} , ¹ Imperial College London, ² Sargent Centre for Process Systems Engineering
16	167* session 11	M²E³D: evolutionary equation discovery and its applications in the powder-handling industries A. Leonard Nicsan, Kit Windows-Yule, University of Birmingham
17	169* session 11	Enhancing erosion prediction in elbows using data-driven methods: a machine learning approach Isa Mohammed ¹ , Adel Alghamdi ¹ , Thomas Abadie ^{1,2} , Sibó Cheng ¹ , Omar K Matar ¹ , ¹ Imperial College London, ² University of Birmingham
19	184* session 11	Comparison of different coarse-grained CFD-DEM modelling strategies in horizontal plug flow pneumatic conveying Oguzhan Erken ^{1,2} , Kevin J. Hanley ² , Jin Y. Ooi ² , Prashant Gupta ¹ , ¹ Procter & Gamble Technical Centre Ltd, ² University of Edinburgh
20	213* session 11	Predicting and optimizing key performance indicators of chemical reactions through probabilistic Gaussian models Pablo J. Salazar, Brahim Benyahia, Loughborough University
21	239* session 11	Optimal start up, grade transition and shutdown strategies for more sustainable and agile continuous pharmaceutical plants – case of multistage continuous crystallization Jiaxu Liu, Brahim Benyahia, Loughborough University
22	251* session 11	Towards industrial scale production of graphene and its applications Andrius Patapas ¹ , Jason Stafford ² , Alalea Kia ¹ , Camille Petit ¹ , Omar Matar ¹ , ¹ Imperial College London, ² University of Birmingham
23	277* session 11	An MIQCP model for symbolic regression Georgios Liapis, Lazaros G Papageorgiou, University College London
24	280* session 11	Finding the physics of chemical processes using machine learning Stefan Egan ¹ , Yash Yeola ² , Shunyi Chang ² , Carlton Baugh ² , ¹ Procter & Gamble, ² University of Durham

Molecular Systems Engineering

25	6	Machine learning nucleation collective variables with graph neural networks Florian M. Dietrich ¹ , Gianpaolo Gobbo ² , Michael A. Bellucci ² , Matteo Salvalaglio ¹ , ¹ University College London, ² Xtali Pi Inc
26	20	Evaluation of polymer-calcite interfacial strength through a uniaxial tensile simulation study Keat Yung Hue ¹ , Maung Maung Myo Thant ² , Omar Matar ¹ , Paul Luckham ¹ , Erich Müller ¹ , ¹ Imperial College London, ² PETRONAS Research Sdn. Bhd
27	41* session 11	Development of thermodynamically consistent machine-learning equations of state: application to the Mie fluid Gustavo Chaparro, Erich A Müller, Imperial College London
28	44	Atomic force microscopy of hydrolysed polyacrylamide adsorption onto calcium carbonate Jin Hau Lew ¹ , Omar K. Matar ¹ , Erich A. Müller ¹ , Paul F. Luckham ¹ , Adrielle Sousa Santos ¹ , Maung Maung Myo Thant ² , ¹ Imperial College London, ² PETRONAS Research Sdn. Bhd
29	76	Bio-inspired structure design of sustainable nanocellulose for anti-bacterial coatings Hui Mao, Hisay Lama, João Cabral, Imperial College London
30	105	Molecular diffusion in different pore sizes and morphologies of SBA-15 studied by NMR spectroscopy. Yiheng Xiao, University of Manchester
31	118* session 11	Prediction of the interfacial tension of sugar-based surfactants through molecular modelling Muhammad Arief Hafizhullah Kamrul Bahrin ¹ , Erich A Muller ¹ , Omar K Matar ¹ , Harry Cárdenas ¹ , Andrés Mejía ² , Sara Shahrudin ³ , Jofry Othman ³ , ¹ Imperial College London, ² Universidad de Concepción, ³ PETRONAS Research Sdn. Bhd.

Poster Board number	Oxford Abstract ID number.	POSTER TOPICS AND TITLES
32	191	Acoustic levitation of CNC-stabilised emulsion droplets for porous particle formation <u>Liva Donina</u> , Hui Mao, Joao Cabral, Imperial College London
33	227	Exploring atomic layer deposition ZSM-5 zeolites: unveiling physicochemical properties and investigating powder flow behaviour for enhanced powder processing <u>Angeliki Chalasti</u> ¹ , Canan Gücüyener ² , Ian Harkness ² , Jerry Y. Y. Heng ¹ , ¹ Imperial College London, ² Johnson Matthey Technology Centre
34	237	Effect of supersaturation and agitation on the 'regeneration' phenomenon in crystal growth <u>Isha Bade</u> , Clement Tan, Jerry Heng, Imperial College London
35	263* session 11	Towards more effective greener-by-design multistep synthesis of Active Pharmaceutical Ingredients – the interplay between computer-aided retrosynthetic and flow chemistry <u>Rodolfo Teixeira</u> , Brahim Benyahia, Loughborough University
36	278* session 11	Free energy surfaces and their convergence from independent molecular simulations subject to multiple biases <u>Antoniu Bjola</u> , Matteo Salvalaglio, University College London

Net Zero Energy Pathways

37	34* session 10	Structural deformation and thermal runaway of li-ion batteries caused by mechanical abuse under different temperatures <u>Jinlong Bai</u> ^{1,2} , Zhirong Wang ² , Guohong Tian ¹ , Qiong Cai ¹ , ¹ University of Surrey, ² Nanjing Tech University
38	55* session 10	Phase behaviour of methanol +CO₂ at temperatures between 230 and 423.15 K <u>Riley Latcham</u> , Martin Trusler, Imperial College London
39	77* session 10	Optimising the design & dynamic performance of the power conversion system for a pulsed fusion reactor <u>Oliver M. G. Ward</u> ¹ , Federico Galvanin ¹ , Nelia Jurado ² , Daniel Blackburn ² , Robert J. Warren ² , Eric S. Fraga ¹ , ¹ University College London, ² UK Atomic Energy Authority
40	86* session 10	Potentials of progressive and disruptive innovation-driven cost reductions of green hydrogen production <u>Thorin Daniel</u> , Lei Xing, Qiong Cai, Jin Xuan, University of Surrey
41	108* session 10	Understanding and reducing instability in boiling to achieve efficient heat transfer performance in a microchannel heat sink <u>Darshan Mysore Basavaraja</u> ¹ , Mirco Magnini ² , Omar K Matar ¹ , ¹ Imperial College London, ² University of Nottingham
42	121* session 10	Free-standing carbon hosts for lithium-sulfur electrodes <u>Heather Au</u> , Samantha Southern, Magda Titirici, Imperial College London
43	137* session 10	Sustainable production of biodiesel from waste biomass in intensified reactors <u>Mark Fullerton</u> , Jhuma Sadhukhan, Dimitrios Tsaoulidis, University of Surrey
44	151* session 10	Thermophysical properties of amino acid salt solutions for carbon capture <u>Hossam Qusty</u> , Paul Fennell, Martin Trusler, Imperial College London
45	168* session 10	Achieving net zero for methanol production through the use of dual function materials <u>A. Ipek Paksoy</u> ^{1,2} , Tomas Ramirez Reina ³ , Melis S. Duyar ¹ , ¹ University of Surrey, ² Uskudar University, ³ University of Seville-CSIC
46	249* session 10	Energy transition through the engineering perspective: from experts to non-experts. <u>Andrea Oyarzún-Aravena</u> ^{1,2} , Jiying Chen ¹ , Jethro Akroyd ^{1,3} , Markus Kraft ^{1,3,4,5} , ¹ University of Cambridge, ² Universidad de Magallanes, ³ CARES, ⁴ Nanyang Technological University, ⁵ The Alan Turing Institute
47	252* session 10	Enhancements of amine CO₂ absorption rate and degradation in the presence of nickel nanoparticles catalysts <u>Harold Orendi</u> , Kevin Joby, Lidija Šiller, Newcastle University
48	267* session 10	Comparative Analysis of the Hydraulic Properties of Commercial Gas Diffusion Layers - a Numerical Approach <u>Grace Aquah</u> , Vahid Niasar, University of Manchester

Sustainable and Efficient Chemical Processes

49	17* session 12	Tailoring 3D printed micro-structured carbons for adsorption Stuart Scott ¹ , John Chew ¹ , Jonathan Barnard ¹ , Andrew Burrows ¹ , Martin Smith ² , Steven Tennison ³ , Semali Perera ¹ , ¹ University of Bath, ² CBR Division, Defence Science & Technology Laboratory, ³ Carbon Tex Ltd
50	18* session 12	IonoSolv processing of plant biomass – state-of-the-art, challenges and perspectives Pedro Nakasu, Jason Hallett, Imperial College London
51	39* session 12	Hypercrosslinked polymers for lignin fractionation process Tianhao Zhang, Roberto Rinaldi, Imperial College London
52	43* session 12	A sustainability-oriented digital twin of the diamond pilot plant Donald Ntamo ¹ , Iason Papadopoulos ² , Payam Soulatiantork ¹ , Mohammad Zandi ¹ , ¹ University of Sheffield, ² Risktec Solutions
53	45* session 12	Catalytic upgrading of plastic waste into value-added chemicals with high product selectivity: reaction system design and catalyst preparation Jingyang Bai ¹ , Xiangyi Long ¹ , Marcos Millan ^{1,2} , ¹ Imperial College London, ² King Fahd University of Petroleum & Minerals
54	53* session 12	Soft-sensor with uncertainty quantification for rapid analysis of biomass fractionated using ionic liquids Suhaib Nisar, Agnieszka Brandt-Talbot, Benoit Chachuat, Jason Hallett, Imperial College London
55	64* session 12	Atomistic and coarse-grained models for cyrene vapour liquid equilibria and transport properties predictions Callum Donaldson, Carmelo Herdes, University of Bath
56	90* session 12	Multi-objective Bayesian optimisation for Schotten-Baumann reaction in flow Jiyizhe Zhang ¹ , Naoto Sugisawa ² , Kobi Felton ¹ , Shinichiro Fuse ² , Alexei Lapkin ^{1,3,4} , ¹ University of Cambridge, ² Nagoya University, ³ Innovation Centre in Digital Molecular Technologies, ⁴ Cambridge Centre for Advanced Research and Education in Singapore
57	111* session 12	Developing sustainable and cost-effective microfluidic platforms for manufacturing of micro-drug delivery systems Anna Tsitouridou ¹ , Maryam Parhizkar ² , Charley Wu ¹ , Tao Chen ¹ , Dimitrios Tsaoulidis ¹ , ¹ University of Surrey, ² University College London
58	116* session 12	Green synthesis of Zn-Fe layered double hydroxide by ionic liquids: unveiling growth mechanism and product characterization Shaoqing Qu, Kyra Campbell, University of Sheffield
59	122* session 12	Investigation of high gas flow rates on hydrodynamics in two-phase gas-liquid stirred tanks using positron emission particle tracking (PEPT) William Peace ¹ , Kit Windows-Yule ¹ , Frédéric Augier ² , Mark Simmons ¹ , ¹ University of Birmingham, ² IFP Energies Nouvelles
60	130* session 12	Predicting gas sorption in rubbery and glassy polymers for CO₂ removal, transport and storage Louis Nguyen ¹ , Michele Valsecchi ² , Amparo Galindo ¹ , George Jackson ¹ , Christopher Tighe ¹ , ¹ Imperial College London, ² Columbia University
61	133* session 12	Mixing characteristics of a Taylor Vortex Reactor with a ribbed rotor Suneha Patil, Georgios Gkogkos, Eleni Grammenou, Asterios Gavriilidis, University College London
62	171* session 12	FLOWMAPPER: Examples of applications of a circular design tool developed in collaboration with the Dyson School of Design Engineering Sergio Barbarino, Nicky Caton, Procter & Gamble
63	188* session 12	Dispersion and dissolution of starch particles enhanced by high shear Andrew Terhemem Tyowua, Zhibing Zhang, Michael Adams, University of Birmingham
64	211* session 12	Effect of fluid shear on the polymorphism of seeded crystallizations of gamma glycine Lucas Nahas ¹ , Jan Sefcik ¹ , Mark Haw ¹ , Mei Lee ² , ¹ University of Strathclyde, ² GlaxoSmithKline
65	217* session 12	Experimental screening of transition metal-doped TiO₂ for hydrogen production through photoreforming of organics Ruiman Ma ¹ , Sergio Vernuccio ¹ , Marica Muscetta ² , ¹ University of Sheffield, ² Università di Napoli "Federico II"

Poster Board number	Oxford Abstract ID number.	POSTER TOPICS AND TITLES
66	226* session 12	Influence of operating parameters on dry powder coating <u>Francisco Kisuka</u> ¹ , Colin Hare ¹ , Mingzhe Yu ² , Alexander Munnoch ² , ¹ Newcastle University, ² Johnson Matthey Plc
67	234* session 12	Liquid flow in a rotating packed bed <u>Emily Leather</u> , Newcastle University
68	262* session 12	Tuning of pharmaceutical crystal properties using intensified processes and additives <u>Neel Mehta</u> , Brahim Benyahia, Loughborough University
69	266* session 12	Extraction of antibiotics from wastewater using aqueous biphasic systems based on ethyl lactate and choline salts <u>Marion Engole</u> ^{1,2} , Patricia Thornley ¹ , Vesna Najdanovic ¹ , ¹ Aston University, ² Busitema University

Education

70	54* session 10	Analysis of climate change education in chemical engineering curricula at UK universities <u>Matt Keith</u> , Oluwaseyi Falomo, University of Birmingham
71	142	Are timed assessments inclusive and sustainable? – Insights from conversations with neurodiverse university students <u>Vijesh Bhute</u> , Imperial College London
72	145	Know your audience – what does it mean to be a neurodiverse engineering student? <u>Vijesh Bhute</u> , Imperial College London
73	146	Can you read it out loud? a case for developing accessible and sustainable course book for engineering students <u>Vijesh Bhute</u> , Ellen Player, Deesha Chadha, Umang Shah, Imperial College London
74	162* session 10	Should debates form part of the assessment for chemical engineers? <u>Eoin Syron</u> , Recep Kaan Dereli, University College Dublin
75	163	A case study: promoting international postgraduate taught engineering students' teamwork skills via interactive design workshop <u>Ya He</u> , Mo Zandi, University of Sheffield
76	165* session 10	Sustainable practice in chemical engineering ungraduated teaching laboratory: case study of biodiesel production from waste cooking oil <u>Zahra Echresh Zadeh</u> ¹ , Solomon Bawa ¹ , Yusuf Umar ² , Elton Rodrias ¹ , ¹ University College London, ² Entoplast Ltd
77	173	Sustaining teaching excellence: exploring the utility of micro-teaching sessions for graduate teaching assistants (gtas) in chemical engineering <u>Deesha Chadha</u> , Umang Shah, Vijesh Bhute, Andrew Macey, James Campbell, Clemens Brechtelsbauer, Imperial College London
78	199	Delivering interdisciplinary MSc projects across traditional engineering departments – lessons learned <u>Hosam Aleem</u> , University of Manchester
79	207	Paper marbling as a teaching tool for molecular engineering <u>Liva Donina</u> , João Cabral, Imperial College London

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Campus map

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- 2 ACEX BUILDING**
Satellite Workshop: Equality, Diversity and Culture drop-in workshop, led by Dr Deesha Chadha OBE and Professor João T. Cabral, will take place in room 228 (DCR) on 25 April, 09.30. Refreshments will be provided. See page 8 for more.
- 3 CHEMENGDAY REGISTRATION (QUEEN'S TOWER ROOMS)**
Registration will commence at 11.50 on 25 April. We will also have refreshments and exhibitions available in this space, across the two days.
- 4 SIR ALEXANDER FLEMING BUILDING**
All lectures and oral sessions will take place here.

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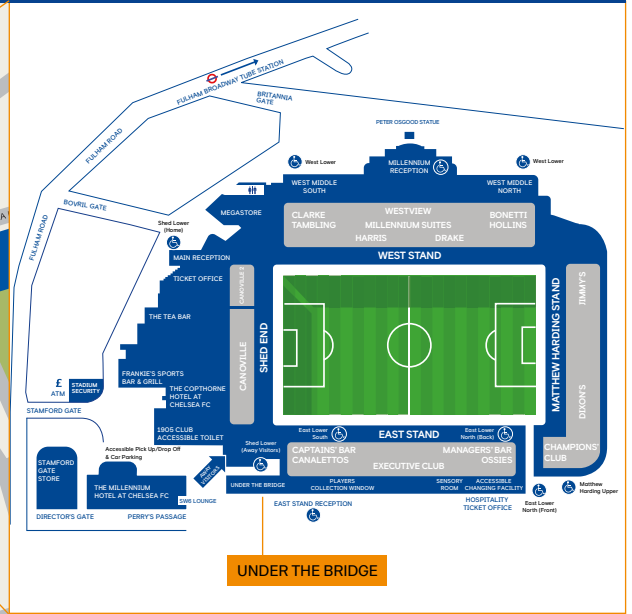
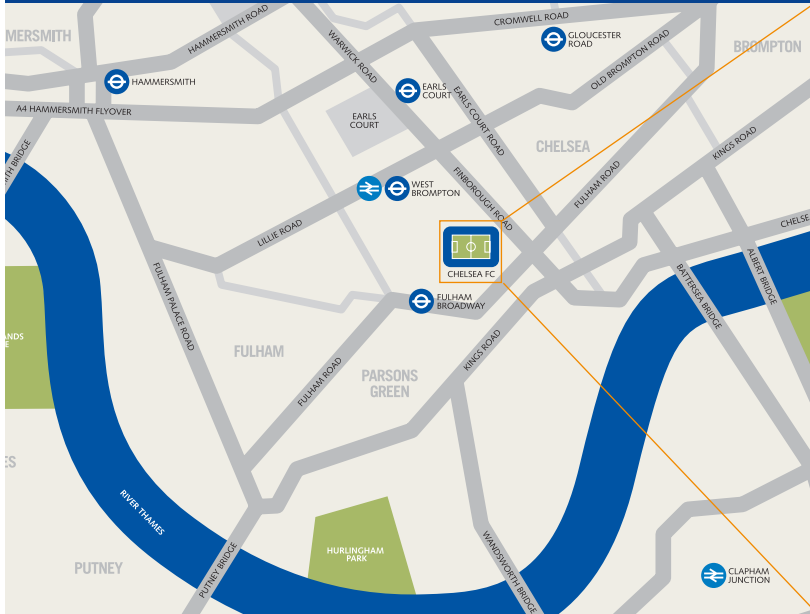
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