

pig MONTHLY

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AICHE Spring Meeting

The *AICHE Spring Meeting* is a yearly event for practising chemical engineers to discuss a range of subjects relevant for the current needs of industry. This year, the meeting took place in Orlando, Florida from April 22nd—26th, and was held in conjunction with the 14th *Global Congress on Process Safety* and the 8th *World Congress on Particle Technology*. Featured topics included: Process Intensification, Sustainable Engineering, Emerging Technologies in Clean Energy and Innovative and Smart Manufacturing, to name but a few. Proceedings for the full meeting can be found [here](#). The PIG was well-represented at this meeting by: Dr Kamelia Boodhoo, Dr Anh Phan, Dr Vladimir Zivkovic, Dr Richard Law, Dr Steven Wang and Dr Ahmed Mustaffar, who presented a mix of oral and poster presentations (details on next page).



Upcoming Conferences

- [European Symposium on Computer Aided Process Engineering, ESCAPE28](#) (10-13 June 2018, Graz, Austria)
- [22nd Annual Green Chemistry & Engineering Conference](#) (18-20 June 2018, Portland, Oregon, US)
- [16th International Heat Transfer Conference](#) (10-15 August 2018, Beijing, China). Registration Deadline: **30th June 2018**
- [7th PhD-Student Workshop on Polymer Reaction Engineering](#) (31 Aug-2 Sep 2018, Prague, Czech Republic). Registration Deadline: **30th June 2018**
- [1st European Forum on New Technologies: Chem. Eng. & 3D Printing](#) (7 Sep 2018, Paris, France)
- [12th Symposium on the European Society of Biochemical Engineering Sciences](#) (9-12 Sep 2018, Lisbon, Portugal). Final Deadline for Poster Submission: **30th June 2018**
- [16th European Conference on Mixing](#) (9-12 Sept 2018, Toulouse, France). Early Registration Deadline: **9th July 2018**
- [6th International Conference on Micro and Nano Flows, MNF2018](#) (9-12 Sep 2018, Atlanta, Georgia, US). Early Registration Deadline: **15th July 2018**
- [Distillation & Absorption](#) (16-19 Sep 2018, Florence, Italy). Registration Deadline: **30th June 2018**
- [International Conference on Micro Reaction Technology, IMRET](#) (21-24 Oct 2018, Karlsruhe, Germany). Poster Submission Deadline: **21st Sep 2018**
- [2018 AIChE Annual Meeting](#) (28 Oct-2 Nov 2018, Pittsburgh, PA, US). Registration Opens: **July 2018**

AIChE Spring Meeting

Monday 23rd April

- **V. Zivkovic**, R. Law, K. Boodhoo, D.A. Reay. **21b**. Process Intensification By Miniaturization of Fluidized Beds | Fundamentals of Fluidization II | Invited Oral Presentation | 13:52—14:09
- **R. Law**, D.A. Reay. **55a**. Towards Standardisation of Process Intensification in Solids-Handling Processes—the IbD Platform | Poster Session: Process Development | 17:00—19:00

Tuesday 24th April

- **A. Mustaffar**, K. Boodhoo, A. Phan. **54ax**. Bi-Directional Thermal Control of Twin Screw Granulation Process Via a Specialised Annular Heat Pipe | World Congress on Particle Technology Poster Session | 11:45—13:15
- **S. Wang**. **54au**. Solid liquid separation via particle flow instability | World Congress on Particle Technology Poster Session | 11:45—13:15

Wednesday 25th April

- **K. Boodhoo**, A. Phan, V. Zivkovic, V.C. Eze, A. Mustaffar. **163a**. Intensified-By-Design (IbD): Creating a Platform for Facilitating Process Intensification in Solids Handling Applications | PI in Solids Handling/Processing | Oral Presentation | 08:00—08:20
- **A. Mustaffar**, K. Boodhoo, A. Phan. **163c**. Hybrid Heat Pipe Screw Dryer: A Novel, Continuous and Highly Energy-Efficient Drying Technology | PI in Solids Handling/Processing | Oral Presentation | 08:40—09:00
- **V. Zivkovic**, S. Wang. **54s**. Experimental Study of 3D Printed Surface Granular Mixing in a Rotating Drum | Mixing Segregation Principles | Oral Presentation | 14:36—14:58
- **A. Phan**, P. Prasertcharoensuk, S. Bull. **204f**. Hydrogen Production from Biomass | Biomass Conversion to Valuable Products II | Oral Presentation | 16:40—17:00

ACHEMA Visitor Day Tickets

There are 500 free [visitor day ticket codes](#) available for ACHEMA 2018, through the IbD project, taking place from 11–15 June in Frankfurt, Germany. ACHEMA is a world forum and show for the process industries that offers up-to-date technology trends, provides a worldwide platform for the latest technologies and hosts an array of future-oriented developments, product ideas and services. **Instructions for free tickets:** visitors have to register on the [ACHEMA portal](#), use one code per day, print their badge and bring the printed badge to ACHEMA.

PIG News

- **Dr Kamelia Boodhoo, Dr Sharon Velasquez-Orta, Sahr Sana, Luma Al-Saadi, Tobechi Okoroafor** and **Abdul Rehman** have travelled to Toulouse, France, to attend the *6th International Congress on Green Process Engineering*. The programme is available [here](#), and a full report of the presentations will be available in the next newsletter
- The PIG would like to welcome **Guanqi Wang**, who is a new PhD student working with Dr Steven Wang (co-supervised by Dr Jonathan McDonough). Guanqi is currently studying the mechanism by which particulate matter (PM) is captured by trees for the development of an intensified approach for solving emissions problems
- Congratulations to **Prof David Reay** and **Dr Kamelia Boodhoo** who received the awards for 'Research Supervisor of the Year' and 'Outstanding Contribution to Student Employability' respectively at this year's *NUSU Teaching Excellence Awards (TEAs)*

EPSRC Project Meeting

Prof David Reay, Dr Vladimir Zivkovic and Dr Jonathan McDonough recently attended a two-day meeting at Heriot-Watt University to discuss progress on an EPSRC Carbon Capture Project. This multidisciplinary collaborative project is investigating the use of novel tailored hydrotalcite solid sorbents for CO₂ capture from the industrial sector via the use of intensified fluidized bed technology and waste heat recovery for sorbent regeneration. The project is divided into four work packages: (WP1) synthesis and screening of hydrotalcites (Heriot-Watt University/Sheffield University), (WP2) process intensification of the fluidization unit for CO₂ capture (Newcastle University), (WP3) modelling/simulation of the carbon capture process (Sheffield University), and (WP4) whole system integration with economic/technical/environmental assessment of the proposed technology (Heriot-Watt University). At the meeting, Jonathan presented Newcastle's progress towards WP2. The topics discussed were: industrial CO₂ emissions and waste heat source data, fluidization of novel sorbents, screening of novel sorbents in a fluidized bed and pilot rig commissioning. On the second day of the meeting, members of the industrial advisory board were also in attendance: Air Products and Chemicals (Dr Vince White), MCM Consulting (Dr Alastair Clark), Osprey Corporation Ltd. (Howard Davis) and Telemark University College (Prof Dag Eimer).



Upcoming PIG Seminars

- Friday 8th June
Mohamad Faiz Gunam Resul
- Friday 15th June
Tobechi Okoroafor

2019 Conferences

- [2019 AIChE Spring Meeting and 15th Global Congress on Process Safety](#) (31 Mar-4 April 2019, New Orleans, Louisiana, US)
- [International Symposium on Green Chemistry, ISGC2019](#) (13-17 May 2019, La Rochelle, France). Abstract Deadline: 15th April 2019
- [13th International Workshop on Polymer Reaction Engineering](#) (11-14 June 2019, Hamburg, Germany)
- [International Congress of Chemical Engineering](#) (19-21 June 2019, Santander, Spain)
- [12th European Congress of Chemical Engineering](#) (15-19 Sep 2019, Florence, Italy)
- [2019 AIChE Annual Meeting](#) (10-15 Nov 2019, Orlando, Florida, US)

Fully Funded PhD CASE Project

Industrial Cooperative Awards in Science & Technology (CASE) provide PhD studentship funding through the EPSRC, where businesses take the lead in arranging projects with an academic partner of their choice. There is currently three years of funding available from this scheme for the following project: “*Next generation loop heat pipe wick technology for thermal management of Space and Terrestrial Applications*”, a summary of which can be found [here](#). This project will involve working at both Newcastle University and Aavid Thermacore (situated in Ashington, ~30 miles north of Newcastle). The project will be supervised at Newcastle University by Dr Richard Law and Prof David Reay, while Dr Ryan McGlen will supervise the work at Thermacore. Anyone interested in applying should contact Richard directly: richard.law2@ncl.ac.uk.

Recent PIG Seminars

- **Ben Dannatt** | 6th April
“Biomass flue gas filtration optimisation—Industrial case study”
- **David Okot** | 13th April
“Pyrolysis of biomass briquettes”
- **Dr Fernando Russo Abegao** | 13th April
“Introduction to HE Toolbox Project”
- **Ahmed Al-Hatrooshi** | 27th April
“Marine Waste Biorefinery”
- **Jonathan Harris** | 4th May
“Cold plasma initiated direct conversion of waste cooking oils to fuels and value added products”
- **Eka Utuk** | 11th May
“Real time monitoring of water pollution using microbial fuel cells”
- **Luma Al-Saadi** | 15th May
“Reactive coupling of glycerol transformation to solketal into bio-diesel production process using organic acid catalyst”
- **Dr Kui Zhang** | 1st June
“Development of a non-thermal plasma device to reduce combustion particulate emissions”

New Publications

- V.C. Eze, A.P. Harvey. Continuous reactive coupling of glycerol and acetone—A strategy for triglyceride transesterification and *in-situ* valorisation of glycerol by-product. *Chemical Engineering Journal* 347 (2018) 41-51
- V.H. Grisales Diaz, M. Willis. Kinetic modelling and simulation of batch, continuous and cell-recycling fermentations for acetone-butanol-ethanol production using *Clostridium saccharoperbutylacetonicum* N1-4. *Biochemical Engineering Journal* 137 (2018) 30-39
- X. Han, K.T. Hassan, A. Harvey, D. Kulijer, A. Oila, M.R.C. Hunt, L. Siller. Bioinspired synthesis of monolithic and layered aerogels. *Advanced Materials* 30 (2018) 1706294
- J. Harris, A.N. Phan, K. Zhang. Cold plasma catalysis as a novel approach for valorisation of untreated waste glycerol. *Green Chemistry* 20 (2018) 2578-2587
- J.R. McDonough, A.N. Phan, A.P. Harvey. The mesoscale oscillatory baffled reactor facilitates intensified kinetics screening when the solvent is removed. *Chemical Engineering and Processing: Process Intensification* 129 (2018) 51-62
- A. Mustaffar, A.N. Phan, K. Boodhoo. Hybrid heat pipe screw dryer: A novel, continuous and highly energy-efficient drying technology. *Chemical Engineering and Processing: Process Intensification* 128 (2018) 199-215
- A.F. Mustaffar, D. Reay, A.P. Harvey. The melting of salt hydrate phase change material in an irregular metal foam for the application of traction transient cooling. *Thermal Science and Engineering Progress* 5 (2018) 454-465
- G.A. Oliveira, E. Carissimi, I. Monje-Ramirez, S.B. Velasquez-Orta, R.T. Rodrigues, M.T.O. Ledesma. Comparison between coagulation-flocculation and ozone-flotation for *Scenedesmus* microalgal biomolecule recovery and nutrient removal from wastewater in a high-rate algal pond. *Bioresource Technology* 259 (2018) 334-342
- F. Saleem, K. Zhang, A. Harvey. Role of CO₂ in the conversion of toluene as a tar surrogate in a nonthermal plasma dielectric barrier discharge reactor. *Energy and Fuels* 32(4) (2018) 5164-5170
- S. Stubbs, J. Zhang, J. Morris. BioProcess performance monitoring using multiway interval partial least squares. *Computer Aided Chemical Engineering* 41 (2018) 243-259
- Y. Wang, J. Xu, H. Zhu, S. Wang, C. Yang. Mechanism and regulation of spontaneous water transport in graphene-based nanoslits. *Advanced Theory and Simulations* (2018). Article In-press

Other Information

- Full contact details and research profiles for the PI group members can be found at the website: <http://pig.ncl.ac.uk>
- For enquires about collaborations or PhD study, see the website: <http://pig.ncl.ac.uk>
- If anyone would like to contribute any articles, or if anyone has any ideas regarding the newsletter please contact Jonathan McDonough: jonathan.mcdonough@ncl.ac.uk