

## NEWSLETTER



Welcome to the Summer Edition

Issue 15

July 2017

## Message from CPSE Director, Professor Claire S Adjiman FREng



Welcome to the Summer edition of the CPSE Newsletter. I am delighted to be writing my first message as the Director of CPSE. I would like to thank Nilay Shah for tirelessly working for CPSE during his time as Director. We have had plenty of achievements to celebrate in the past few months. I congratulate Nigel Brandon on his new position as Dean of Faculty of Engineering and Cleo Kontoravdi for her promotion to Reader. I am delighted that Roger Sargent was awarded the IChemE MM Sharma Medal for Lifetime Achievement, a fitting recognition of his major contributions. We were fortunate that IChemE presented this award to him during our Roger Sargent Lecture last December; many thanks to Jonathan Seville and Claudia Flavell-While. CPSE researchers have received many awards, which you will read

about in the Newsletter, but I would like to mention Radu Baltean-Lugojan and Erin Johnson for receiving highly competitive Fellowships. Finally, I would like to congratulate all CPSE PhD students who graduated this year. I am sure you will go on to accomplish great things and be great ambassadors for CPSE! The time since the last Newsletter has been eventful. At the last consortium meeting, we were fortunate to welcome Professor Jay Lee of KAIST who delivered a fascinating lecture and to hear the views some of our industrial members, Patrick Piccione (Syngenta), Don Bartusiak (ExxonMobil) and Costas Pantelides (PSE). Highlights of the activities we organised since include the PSE@ResearchDayUK, the CPSE Optimisation Courses and the Smart Process Manufacturing Symposium. CPSE continues to grow and evolve and I am pleased to welcome three new academics: Christos Markides, Luca Mazzei and Matteo Salvalaglio. We launched a webinar series which kicked off in June with a talk by Eric Fraga. We have also added plenty of content to our website, including unpublished papers and information on software. We welcome your feedback on the activities we have organised and on the website content. The next Consortium meeting will take place on 7th & 8th December 2017 and the 24th Roger Sargent Lecture will be delivered by Professor Frank Allgöwer, Universität Stuttgart. This is set to be a stimulating event and I look forward to seeing you all there! I hope you enjoy the content of the Newsletter and I'd particularly like to draw your attention to the technical article titled "Can Technology Unlock 'Unburnable Carbon'?" by Sara Budinis.

## Chemical Engineering Lifetime Achievement



From left: Jonathan Seville (IChemE's President) and Roger Sargent

CPSE Founding Father, Professor Roger Sargent, has been awarded the Institution of Chemical Engineers' (IChemE) inaugural MM Sharma Medal. The lifetime achievement award was presented at the 23rd Professor Roger Sargent Lecture on 6th December 2016. The MM Sharma Medal was established in 2014, with Sargent as its first recipient. *Continues on page 9.*

## New Dean of Faculty of Engineering



Professor Nigel Brandon has been appointed Dean of Imperial College London's Faculty of Engineering in October 2017.

Professor Brandon is responsible for providing strategic leadership, planning, and coordination for the Faculty of Engineering and for driving continuing excellence in research and education. Professor Brandon is the Director of the [Sustainable Gas Institute](#). He was elected a Fellow of the Royal Academy of Engineering in 2008. Professor Brandon was awarded an OBE for services to UK-China science in 2011 for his work in developing collaborations between the UK and China in the areas of climate-change, energy, and environment.

## Imperial Graduation



From Left: Dr Christina-Anna Gatsiou,  
Dr Aikaterini Diamanti and  
Dr Sadia Rahman

The Postgraduate Awards ceremony took place on 3rd May at the Royal Albert Hall. The ceremony was watched by a record 9400 guests. This year's new graduates took to the stage to receive their awards in the largest Graduation in Imperial's history. Amongst these graduates were CPSE postgraduates: Aaron Borg, Florence Yu Tsing Chow, Ibrahim Asaad I M Daher, Aikaterini Diamanti, Christina-Anna Gatsiou, Cher Goey, Boram Gu, Nikolaos Kazazakis, Dimitrios Nerantzis, Richard Oberdieck, Ana Quiroga Campano, Sadia Rahman and Mauricio Zamorano Mosnaim. The ceremony was hosted by Imperial's President Professor Alice Gast, who addressed the audience of new graduates and their guests:

*"You have the potential to accomplish great things. I hope that you will use your intelligence and education to solve the problems of today and the problems that will arise in the future."*

## Grantham Institute Briefing paper No 22

CPSE's Dr Alba Ramos and Dr Christos N. Markides and their colleagues: Iliaria Guaracino, Dr Alexander Mellor, Dr Diego Alonso-Álvarez, Professor Peter Childs, Dr Nicholas J. Ekins-daukes issued Briefing paper in May 2017 at the Grantham Institute. You can download the paper: Solar-Thermal and Hybrid Photovoltaic-Thermal Systems for Renewable Heating

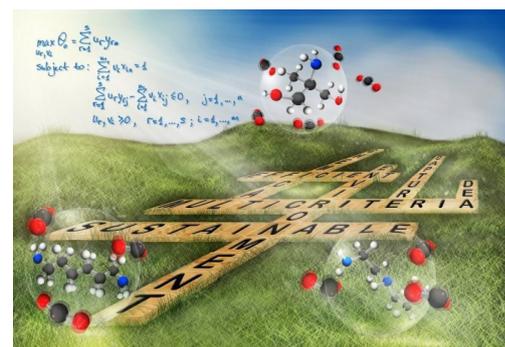
## Sargent Medal Awarded to Professor Floudas



The **Institution of Chemical Engineers** (IChemE), posthumously awarded **Professor Christodoulos A. Floudas** the prestigious **Sargent Medal**. Named after Roger Sargent, CPSE Founding Director, former president of IChemE and Courthaulds Professor of Chemical Engineering. The medal launched in 2014 recognizes major contribution to research in

the area of computer-aided product and process engineering. Professor Sargent is thought by many to be the founding father of Process Systems Engineering and has a huge influence both through his research and his many students and academic tree. The two previous awardees are Professor Costas Pantelides, a Professor of Chemical Engineering at CPSE, Imperial College and the Managing Director of Process Systems Enterprise Ltd (2015) as well as Professor Ignacio Grossmann, the Rudolph R. and Florence Dean University Professor at Carnegie Mellon University (2014). Professor Grossmann was the doctoral advisor for Professor Floudas when he obtained his PhD in 1986. Professor Floudas was awarded the Sargent Medal for substantially influencing and shaping the field of process and systems engineering. Professor Floudas was the director of the Texas A&M Energy Institute and the Erle Nye '59 Chair Professor for Engineering Excellence in the Artie McFerrin Department of Chemical Engineering at Texas A&M University until August 2016, when he passed away on August 2016. On 6th May 2017, a Memorial Symposium was held at Princeton for Professor Floudas. His former PhD students, CPSE academics: Professor Claire Adjiman, Dr Peter DiMaggio and Dr Ruth Misener attended the Symposium.

## New Research



New research uses a decision-making tool developed in microeconomics to identify the most efficient and sustainable chemicals. The research led by CPSE academic Dr Gonzalo Guillén-Gosálbez has led to the development of a new systematic approach which is able to identify the most efficient chemicals while also establishing improvement targets for those found to be inefficient.

The findings were published today in an article in the leading journal *Green Chemistry*, titled "Multi-criteria screening of chemicals considering thermodynamic and life cycle assessment metrics via data envelopment analysis: Application to CO<sub>2</sub> capture."

## UCL Chemical Engineering scoops 8 prizes



**UCL Chemical Engineering Prize winners**

On 27th and 28th March 2017, Birmingham University hosted ChemEngDayUK 2017 which welcomed leading UK Chemical Engineering academics, industry partners and international guests, to discuss developments and innovations towards a more sustainable future. UCL Chemical Engineering showcased their research and won more than half of all prizes on offer, scooping eight awards in total. Winners included CPSE's: Matthew Darby (PhD student with Michail Stamatakis) for the Best Poster of ChemEngDay UK 2017. Michaela Pollock (Teaching Fellow, with Eva Sørensen) for the Best Poster in the theme "Education and Training." Nigel Titchener-Hooker, Dean of UCL Engineering said:

*"The sight of 8 UCL winners on the list of prizes at the Birmingham ChemEng 2017 event has swelled my heart with pride! It's a wonderful testament to your individual efforts, to that of your supervisors and mentors, and to the general ethos of the department. UCL Chem Eng is on the move and you are clearly in the vanguard. Let's keep it up and share your skills and insights with colleagues so that this momentum is maintained. Well done again."*

Dr Christos Markides was interviewed about the volunteer project he is involved in to increase scientific expertise in solar energy in Africa. He talks about the five-year project he is collaborating on with colleagues from African universities to further develop the skills needed to build concentrated solar power systems. You can read the [full interview](#) on imperial college news.

Process Systems Enterprise Ltd (CPSE's spin-out company) and its gPROMS modelling technology was featured as a high-impact case study by IChemE Research Committee. The event was held in the Houses of Parliament. gPROMS was one of the 10 selected case studies shown at the event, for its huge impact on industry and academia.

## Smart Process Manufacturing



**Professor David Bogle**

Professor David Bogle co-organised a symposium on Smart Process Manufacturing with Professor Qian Fung of the East China University of Science and Technology in Shanghai in April. The meeting was a collaboration between the Chinese Academy of Engineering and the Royal Academy of Engineering. Professor Bogle led a delegation of five Fellows of the Royal Academy of Engineering, including Professor Stratos Pistikopoulos and colleagues from Sheffield and Loughborough, to the symposium and gave a presentation entitled 'A Perspective on Smart Process Manufacturing'. There were presentations on Chinese policy and practice and presentations on technical developments and collaborations between academia and industry in China, the UK, USA and Canada. They expect this to enhance co-operation between China and the UK. A special issue of the journal *Engineering on Smart Process Manufacturing* (co-edited by Qian Feng and David Bogle) was issued in tandem with the event.

Dr Gonzalo Guillén-Gosálbez has joined the Editorial Board of the journal "Sustainable Production and Consumption" which is published by IChemE. The journal focuses on the production and use of products and services in a manner that is socially beneficial, economically viable and environmentally benign over their whole life cycle.

New Paper published in *Energy Environmental Science* "Can BECCS deliver sustainable and resource efficient negative emissions?" Mathilde Fajardy<sup>ab</sup> and Niall Mac Dowell, DOI: [10.1039/C7EE00465F](https://doi.org/10.1039/C7EE00465F) (Paper) *Energy Environ. Sci.*, 2017, Advance Article.

Postdoctoral Associate Dr Dimitrios Letsios won second prize at the recent Department of Computing RA Symposium. Well done Dimitrios!!

## Fellowship Awards



Radu Baltean-Lugoian

PhD student Radu Baltean-Lugoian (supervisors Dr Ruth Misener and Dr Panos Parpas) was awarded the 2017-2018 IBM PhD Fellowship award. The IBM Ph.D. Fellowship Awards Program is an intensely competitive worldwide program, which honors exceptional Ph.D. students who have an interest in solving problems that are important to IBM and fundamental to innovation in many academic disciplines and areas of study. This includes pioneering work in: cognitive computing and augmented intelligence; quantum computing; blockchain; data-centric systems; advanced analytics; security; radical cloud innovation; next-generation silicon (and beyond); and brain-inspired devices and infrastructure. Radu's research interests include: Nonlinear non-convex programming (NLP) poses a global optimisation challenge, where tight convex relaxations that scale well with problem size are desirable. Combinatorial NLP problems can interplay non-linearity with integrality constraints, presenting additional difficulty but also significant structure. For instance, the pooling problem, which represents blending on a feed-forward network with intermediate storage, bundles bilinear non-convexities with topological and polyhedral structure that we aim to exploit via a parametric approach. More generally, we aim to efficiently use such structures in parallel Branch & Cut algorithm implementations. You can read the full article on [IBM's Website](#).



Erin Johnson

PhD student Erin Johnson (supervisor Professor Nilay Shah) was awarded the Institute of Chemical Engineers (IChemE) Ashok Kumar Fellowship 2017. The Fellowship is jointly funded by the [Institution of Chemical Engineers \(IChemE\)](#) and the [North-East England Process Industry Cluster \(NEPIC\)](#). The award provides the opportunity to work for three months at the [Parliamentary Office for Science and Technology \(POST\)](#). The work will involve producing a parliamentary briefing note for MP's on a relevant subject. NEPIC's Chief Executive, Stan Higgins, said:

*"Erin not only wrote an excellent briefing paper as part of the application process, she was thought-provoking and insightful in her interview. Her experience in industry and academia exceeded that of other candidates and I look forward to reading her POSTnote when it's published."* You can read the full article on [IChemE's website](#).

## Outstanding Research Team



George Jackson, Professor Erich A Müller and Dr Christos Markides. The team were presented with the award during the graduation

[UNIHEAT project](#), led by Professor Sandro Macchietto and his team received the Imperial's President's Medals for Outstanding Research Team. The team has eighteen members of which there are three CPSE academics: Professor

## Outstanding Contributions



CPSE academic [Professor Geoffrey Maitland](#), Professor of Energy Engineering received the Imperial College Medal for his outstanding contributions to the life and work of the College.

## UKCCSRC Conference



Clara Heuberger at UKCCSRC

On the 11th and 12th April, the UKCCSRC held their biannual conference, CCS in the UK: Delivering for the Future, at Imperial College London. A regular feature at UKCCSRC conferences is the Early Career Researcher (ECR) poster competition, where ECRs have the chance to display their work to senior academics and industry experts. Two independent judges score each poster and competition winners are each awarded a £250 professional development bursary which can be used to attend training courses and industry events. One of the three winning posters was Clara Heuberger's poster "Social, policy, economics, environment: Go now or wait and see?" Clara whose supervisors are Dr Niall Mac Dowell, Professor Nilay Shah and Dr Iain Staffell said:

*"It's a great recognition and honour to receive the UKCCSRC poster prize. The feedback and interest from the IAP gave me additional motivation to push the boundaries of our research."*

## Excellence in Research Supervision



Professor Nina Thornhill received the President's Award for Excellence in Research Supervision. The Award recognises staff who have made exceptional contributions in the research supervision, encouragement and support of postgraduate research students. Professor

Thornhill was the recipient of the President's Award in 2016 as a member of the Control and Power Research Group led by Professor Bikash Pal (Department of Electrical and Electronic Engineering).

## Anglo-Thai Education Award



Panatpong Hutacharoen with Mr Quinton Quayle (former British Ambassador to Thailand and Honorary Chairman for International Beverages Holdings Limited)

CPSE PhD student Panatpong (Obb) Hutacharoen (supervisors: Professors Claire Adjiman, Amparo Galindo and George Jackson) was awarded the 2016 Anglo-Thai Education Award for Excellence in Engineering and Technology by the [Anglo-Thai Society](#). The Anglo-Thai Education Awards for Excellence recognise the exceptional academic achievements of Thai postgraduate scholars in the UK and are strongly supported by the Royal Thai Embassy. Founded in 2005, the Engineering and Technology category has been awarded to students from Imperial since 2010 and Panatpong is the third CPSE student in a row to receive the award. Well done Obb!!

## CPSE Launches Webinar Series



CPSE launched the New Webinar Series! The webinars were initiated in response to feedback from company members. Our members expressed interest in webinars that show the work that goes on in the Centre. The first webinar titled "Stochastic multi-objective methods for dynamic optimisation problems" was given by Professor Eric Fraga (University College London) on Monday 5<sup>th</sup> June 2017. You can watch the recording of Professor Fraga's webinar, on the [CPSE website](#).

## £2M grant from NERC



The UK launched a £8.6m national research programme on how to remove greenhouse gases from the atmosphere. It is thought to be the world's first research programme dedicated to this topic. Dr Niall Mac Dowell has won a £2M grant from NERC on Greenhouse Gas Removal (GGR). The public money will fund projects exploring the real-world potential of "negative emissions" technologies (NETs), including soil carbon management, afforestation, bioenergy with carbon capture and storage (BECCS), enhanced weathering and direct capture of methane from the air. The new research programme is designed to investigate their potential, as well as the political, social and environmental issues surrounding their deployment. It is coordinated by the UK's government-funded National Environment Research Council (NERC).

## New CPSE Management Team Member



Dr Wolfram Wiesemann has joined the CPSE Management Team from the 4th May 2017. Dr Wiesemann (former CPSE student) is Associate Professor of Management Science and Operations as well as Fellow of the KPMG Centre for Advanced Business Analytics at Imperial College Business School, London. Before joining the faculty of Imperial College Business School in 2013, he was a post-doctoral researcher at Imperial College London (2010-2011) and an Imperial College Research Fellow (2011-2012). He was a visiting researcher at the Institute of Statistics and Mathematics at Vienna University of Economics and Business, Austria, in 2010, the Computer-Aided Systems Laboratory at Princeton University, USA, in 2011, and the Industrial Engineering and Operations Research Department at Columbia University, USA, in 2012. Wolfram's research interests revolve around the methodological aspects of decision-making under uncertainty, as well as applications in operations management, energy and finance.

## Academic Promotion



We are delighted to announce that Dr Cleo Kontoravdi has been promoted to Reader. Dr Kontoravdi was a former CPSE student and completed her PhD in 2007. She spent a year in industry and then became a Lecturer in 2007. Her research interests are in the area of biotechnology, with particular focus on the application of systems engineering principles to bioprocessing. Her research involves the systematic integration of model-based tools, such as sensitivity analysis, design of experiments and optimisation, with experimentation on mammalian cell culture systems. Topics of interest include optimisation of culture media and conditions productivity, protein glycosylation, metabolic flux analysis and multiscale modelling.

## Dr Misener Recognised by RAEng



CPSE Academic, Dr Ruth Misener, was the winner of the RAEng Engineers Trust Young Engineer of the Year competition. The awards are presented to early career researchers whose achievements are recognised as outstanding, having a major impact in their respective fields. Dr Misener is a chemical engineer by training but now focuses on developing innovative approaches to process systems engineering and biomedical engineering in the Department of Computing. Dr Misener received the recognition at the Royal Academy of Engineering Awards during a Dinner ceremony on 29 June 2017. Professor Daniel Rueckert, Head of the Department of Computing said:

*"Ruth's research integrates algorithm development and mathematical optimisation to solve real-world problems in biomedical engineering and process systems engineering. The department is really proud to have outstanding young engineers such as her. Well done on a much-deserved accolade."* You can read the full article here.

## CPSE Welcomes Three New Academics

*The number of CPSE academics continues to grow. We now have 33 academics from Imperial College London and University College London*



**Dr Christos Markides**  
Imperial College

Dr Christos Markides is a Reader in Clean Energy Processes at the Department of Chemical Engineering, Imperial College London. He has MEng degree in Engineering from the University of Cambridge and a PhD in Energy Technologies, also at the

Department of Engineering of the University of Cambridge which he obtained in 2005. After completing his education, he worked for a short time as a Postdoctoral Research Associate (PDRA) at Cambridge University Engineering Department (CUED) while also being made a Fellow and Engineering Director of Studies at Robinson College. In 2006 he co-founded a spin-out of company which was embedded in CUED to develop a thermally powered fluid pumping technology based on a two-phase thermofluidic oscillator concept. He acted as the company's Technical Director until 2008 when he was awarded a 5-year co-current Fellowship by the Research Council UK (RCUK) and (then) Foster Wheeler Energy Ltd. (FWEL); now Amec Foster Wheeler. He now leads the Clean Energy Processes (CEP) Laboratory.



**Dr Luca Mazzei**  
University College  
London

Dr Luca Mazzei is a Senior Lecturer in Chemical Engineering at the Department of Chemical Engineering, University College London. He has Laurea in Chemical Engineering from University of Naples "Federico II", Italy. He also has PhD in Chemical Engineering University College London. Dr Mazzei

is particularly interested in teaching students to think critically and use as much as possible the classical methods of chemical engineering - based on dimensional analysis, order of magnitude analysis and scaling - to rapidly gain insight into physical and chemical processes without resorting to complex mathematics or numerical methods. Being able to pose the right questions, employ a correct methodology to find the answers and quickly estimate the essential features characterizing a process are crucial skills that he tries to emphasize and develop in students.



**Dr Matteo Salvalaglio**  
University College  
London

Dr Matteo Salvalaglio is a Lecturer in the Department of Chemical Engineering, University College London. In 2005 he received Italian "Laurea Triennale" in Chemical Engineering and in 2007, Italian "Laurea Specialistica" in Chemical Engineering. In 2011, he obtained PhD in Chemical Engineering, Politecnico di Milano. His research interests are in how molecular properties affect technologically relevant processes in the fields of chemical and biochemical engineering. He applies molecular dynamics and state-of-the-art enhanced sampling methods to compute thermodynamics and kinetics at the molecular level: Crystallization, Nucleation, Protein-ligand binding, Molecular Dynamics Enhanced Sampling.

You can read more about the new CPSE academics on the CPSE Website:  
<http://www.imperial.ac.uk/process-systems-engineering/about-cpse/people/academic-staff/>

## 2017 PSE@ResearchDayUK

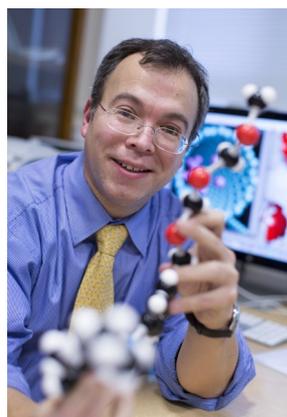


Dr Benoit Chachuat and  
Vassilis M. Charitopoulos

On 27th June 2017, CPSE hosted the second PSE@ResearchDayUK. Students and academics from UK universities gathered to explore the latest technological advances in core and emerging application areas in PSE. The event kicked off with Opening Lecture “*Process Integration: A Perspective*” from Professor Robin Smith, University of Manchester. This was followed by talks and posters from postgraduate students. There were three prize winners: Vassilis M. Charitopoulos from University College London was the winner of the oral presentation for his talk “*Towards Exact Multi-Setpoint Explicit Controllers for Enterprise Wide Optimisation*”. He received £250 amazon vouchers. First prize for Poster Presentations of the sum of £150 was awarded to Andrés González Garay from Imperial College London for his poster “*Production of Propylene Glycol from Biodiesel Glycerol: A Techno-Economic and Environmental Assessment Under Uncertainty*.” Runner up receiving £100 was Georgia Kouyialis from Imperial College London for her “*Heuristics with Performance Guarantees for the Minimum Number of Matches in Heat Recovery Networks*”, Imperial College London. A selection of papers presented during the PSE@ResearchDayUK will be published in the special issue of **Chemical Engineering Research and Design (ChERD)**. Invitations will be sent after the conference. The date for the 2018 PSE@ResearchDayUK will be announced on the CPSE website soon.

On 16th and 17th March, Dr Federico Galvanin and Dr Stefan Guldin successfully ran a Design of experiments for experimentalists (DoE) two-day workshop, focused on DoE for the development of regression models (statistical “black-box” DoE) or deterministic models (Model-based Design of Experiments, MBD<sub>oE</sub>). Each day covered a morning session where keynote speakers from different backgrounds illustrated the theoretical aspects of the topic.

## Best Modelling Team



A team led by Professor Erich Müller won the 9th Industrial Fluid Properties Simulation Challenge beating seven of the best modelling teams in the world. The challenge involved predicting the interfacial tension of water/oil mixtures at high pressures and temperatures, conditions at which there were no published data. Professor Müller’s team employed the SAFT coarse grained force fields developed within the Molecular Systems Engineering group at CPSE. Results were disclosed on 13th November at the meeting of the AIChE in San Francisco.

## Annual Consortium Meeting



The Annual CPSE Consortium Meeting took place in December 2016. We had presentations from Students, academics and industrial members: Dr Patrick Piccione (Syngenta) presented on a joint project with Professor Nilay Shah (CPSE) titled “Development of CAT (Crop Allocation Tool)”. Professor Costas Pantelides (PSE) gave a talk on “Ubiquitous Process Systems” and Dr Don Bartusiak (ExxonMobil) gave a talk on “Current Challenges in Industrial Process Control.” Presentations from the Annual Meeting are available on the ‘Members Only’ section of the website.

A new Paper has been published in Nature Climate Change “The role of CO<sub>2</sub> capture and utilization in mitigating climate change” Niall Mac Dowell, Paul S. Fennell, Nilay Shah & Geoffrey C. Maitland, *NATURE CLIMATE CHANGE* 7, 243–249 (2017) doi:10.1038/nclimate3231

## Professor Roger Sargent



Sir Frank Whittle Medal

Continuing from page 1. The MM Sharma Medal is IChemE's 'lifetime achievement' award for academia, and recognises an outstanding, sustained contribution to chemical engineering research. Professor Sargent was presented with the MM Sharma medal by IChemE's President Jonathan Seville during the Roger Sargent Lecture. A lecture held annually by CPSE as tribute to his vision, leadership and contributions in the field of process systems engineering. Professor Jay H Lee of the Korea Advanced Institute of Science and Technology gave the lecture, on the theme of mathematical programming and dynamic programming.

*"It is an honour to present Professor Roger Sargent with this special medal, which commemorates one of the most distinguished Indian chemical engineers MM Sharma. To many chemical engineers Roger is a role model who has left a lasting legacy. The award of this medal recognises the extraordinary impact he has had on both academic and industrial practice."* Jonathan Seville, IChemE's President

Earlier this year Professor Sargent also received the Royal Academy of Engineering's Sir Frank Whittle Medal for an outstanding and sustained achievement to the industry. Professor Sargent recently celebrated his 90th birthday, an occasion that will be honoured with a special issue of IChemE journal Chemical Engineering, Research and Design.

*"I'm quite overwhelmed by this award and would like to express my sincere gratitude to IChemE and those who have supported me throughout my career. I have been very lucky doing what I love for over 60 years, and to see it making a difference to chemical engineering even today is hugely rewarding."* Professor Roger Sargent

**The next 24th Professor Roger Sargent Lecture** will be delivered by Professor Frank Allgöwer, Universität Stuttgart on 7th December 2017 at 17:30. You can read the full article from [IChemE's website](#).

## Engineering Journal

CPSE has 3 papers published in Special Issue of Engineering Journal published in April 2017.

**"A Perspective on Smart Process Manufacturing Research Challenges for Process Systems Engineers"** Ian David Lockhart Bogle, Engineering . 2017, 3 (2): 161 -165 . DOI: 10.1016/J.ENG.2017.02.003

**"Nonlinear Model-Based Process Operation under Uncertainty Using Exact Parametric Programming"** Vassilis M. Charitopoulos, Lazaros G. Pappageorgiou, Vivek Dua, Engineering . 2017, 3 (2): 202 -213 . DOI: 10.1016/J.ENG.2017.02.008

**"Interactions between the Design and Operation of Shale Gas Networks, Including CO<sub>2</sub> Sequestration"** Sharifzadeh Mahdi, Xingzhi Wang, Nilay Shah, Engineering . 2017, 3 (2): 244 -256 . DOI: 10.1016/J.ENG.2017.02.007



UCL Chemical Engineering Prize winners



Prof Sargent and his Academic Sons



Prof Jay Lee and Prof Claire Adjiman



2016 Annual CPSE Consortium Meeting



Smart Process Manufacturing Symposium



Graduation Ceremony 2017

## Dates For Your Diary!

### Can the UK's gas grid go green?

New white paper explores options



Researchers at the Sustainable Gas Institute (SGI) at Imperial have reviewed evidence on low-pressure gas networks, which is the part of the gas infrastructure that supplies homes and businesses. The researchers investigate switching the gas network to other sources of lower-carbon energy such as biomethane and hydrogen. The white paper focuses on the technical, environmental and economic costs associated with decarbonising the network. For example, the researchers explored the costs to consumers in converting existing gas consuming homes to decarbonised sources.

The lead author of the white paper, Dr Jamie Speirs from the Department of Earth Sciences & Engineering discusses the findings in this [short video](#).

[Erin Johnson](#), a PhD in Chemical Engineering from Centre for Process Systems Engineering, was a co-author in the paper. Erin evaluated the current state of the gas grid, exploring current usage, geographical extent, carbon intensity ([VIDEO](#)).

The [report](#) and [summary](#) can both be found on the Sustainable Gas Institute's website.



### CPSE Industrial Consortium Meeting

The Annual Industrial Consortium Meeting will take place on 7th and 8th December 2017

### **Optimisation Courses**

[CPSE Optimisation courses](#) took place in April and May 2017. The courses were successful with double the attendances. **Introduction to Optimisation** and **Advanced Optimisation** were created in 2015, to tackle concepts in problems formulation and solution method in optimisation at basic and advanced levels. The courses are suitable for those in Industry and also individuals seeking to advance their knowledge in optimisation. CPSE Consortium Member Companies can enrol up to two employees for free. One of the attendees, Dr Mayank Patel from Process Systems Enterprise Ltd said:

*"I regularly interact with parties that are interested in optimising their chemical processes to some degree. The course entitled "Introduction to Optimisation Course" allowed me to gain insight into the types of problems that are prevalent within industry and understand the approaches available to tackle them from a formulation and solution standpoint."*

For more information, please email Miss Senait Selassie: [s.selassie@imperial.ac.uk](mailto:s.selassie@imperial.ac.uk)

The CPSE Newsletter aims to keep members of the Industrial Consortium, Staff and Students updated on Centre activities. If you have any comments, or would like to add to the next issue, please email: Miss Senait Selassie: [s.selassie@imperial.ac.uk](mailto:s.selassie@imperial.ac.uk).

