

NEWSLETTER



Welcome to the Consortium Meeting Edition

Issue 8

October 2013

Message from CPSE Director, Professor Nilay Shah



It has been a privilege to share yet another outstanding year with you all. I would like to thank those of you who provided letters for support for our proposal for a new Centre for Doctoral Training in Process Systems Engineering. Our proposal was well received by the reviewers and we proceeded to the interview stage. Three of us (myself, Stratos Pistikopoulos and Lazaros Papageorgiou) had an interview at EPSRC on 24 Oct and we should know the outcome on 22 Nov. We also had an Industry Day with Syngenta at Imperial, discussing technical approaches to a list of topics drawn up by Syngenta. Formal presentations were kept short allowing the majority of the day to be spent on the details of potential approaches to solving a number of processing topics relevant to Syngenta. Judging by the amount of discussion, the day was a success and we hope that more Consortium Members will take part in Industry Days in the future. During our Annual Consortium Meeting on 5–6 Dec, I will discuss Industry Days and other Consortium matters and so I look forward to seeing many of our members.

I would like to take this opportunity to introduce our new academics: Dr Wolfram Wiesemann, Panos Parpas, James Keirstead and Michail Stamatakis. Sadly, Daniel Kuhn left Imperial and is now working at the College of Management of Technology. Daniel was a valued academic and he will be greatly missed. I would like to Congratulate; Stratos Pistikopoulos who was elected Fellow of the Royal Academy of Engineering, Lazaros Papageorgiou for being promoted to Professor, Claire Adjiman, Amparo Galindo and Erich Muller for giving excellent Inaugural Lectures, Dr Eva Sørensen for receiving the ExxonMobil Excellence in Teaching award and Geoffrey Maitland for receiving 2013 President and Rector's Award for Pastoral Care, as well as, for being elected Deputy President of the Institution of Chemical Engineers. Well done to Sakis Mantalaris for getting €2.5m Advanced Grant from the European Research Council (ERC) and also to the many CPSE students that won competitions. In this newsletter, you will be able to read about these and much more, including the launch of the Manufacturing Futures Lab which I officially opened in June and the book that James Keirstead and I launched titled 'Urban Energy Systems: An Integrated Approach.' I am immensely proud of our achievements and would like to congratulate each CPSE member for your hard work. I would like to also warmly welcome our new Students, Researchers and Academics to CPSE!

Academic News

Professor Nilay Shah, Director of CPSE has been promoted to other roles: he is Director of Research in the Department of Chemical Engineering in addition to being Director of Imperial's Manufacturing Futures Lab. Professor Nina Thornhill has become Director of Undergraduates Studies in the Dept and Professor Erich Muller remains as Director of Resource. Professor Stratos Pistikopoulos has stepped down as Director of Research and will be going on sabbatical in January 2014.

Professors Claire Adjiman and Amparo Galindo had two papers accepted for publication in Nature journal.

"Thanks to all of you who provided letters for support for our proposal for a new Centre for Doctoral Training in Process Systems Engineering. Our proposal was well received by the reviewers and we proceeded to the interview stage..."

Professor Nilay Shah

Professor Bogle gave a two week Advanced Optimisation Techniques course to Chemical Engineering Masters students at the University of Palermo in Sicily in July. The three top students, Fabio Santoro, Roberto Fucarino and Marta Mazzarella, are undertaking three month research projects at UCL from September to December.

Dr Benoit Chachuat has been elected the "2016 Programming Coordinator" for area 10d of AIChE CAST.

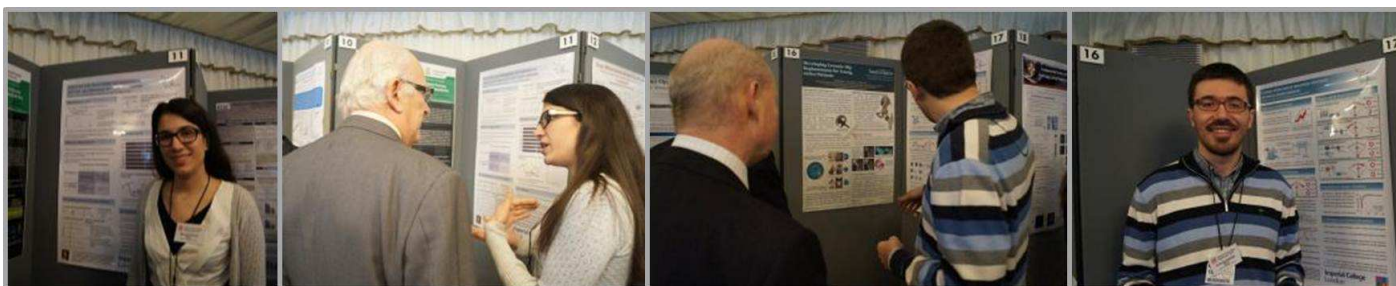
Academic News

CPSE Director, Professor Nilay Shah was interviewed in the several newspapers, following the lack of a report into global decomposition. He emphasised the need for concerted global action. He is quoted in the Guardian at: www3.imperial.ac.uk/climatechange/publications/collaborative/halving-global-co2-by-2050

Professor Geoffrey Maitland has been elected Deputy President of the Institution of Chemical Engineers from May 2013.

Lazaros Papageorgiou has been promoted to Professor.

2013 SET For Britain Event at the House of Commons



Inês Cecilio and Davide Fabozzi at the House of Commons

Two Process Automation researchers presented posters at the 2013 SET For Britain event at the House of Commons on March 18th 2013. SET For Britain is an annual competition to encourage, support and promote Britain's early-career research scientists, engineers and technologists. Inês Cecilio presented her work entitled "*Detection and Diagnosing Disturbances in Natural Gas Processes with Signal Analysis*". Large-scale gas handling facilities are part of the strategic infrastructure of Europe supplying gas to tens of millions of homes and businesses. Increasing electrification of the process machinery brings a new challenge for troubleshooting of these facilities. Her poster explained the challenges and discussed what she is doing about it. Link to poster Davide Fabozzi presented his work on "*Flexible Operation of Industrial Processes Acting as Power Reserves*". In his poster, Davide discussed concepts for the automated use of industrial loads as secondary frequency reserves in order to cope with intermittent generation from renewable sources. To find out more, please check: <http://www3.imperial.ac.uk/processautomation/news>

Manufacturing Futures Lab Launched



Professor Nilay Shah (MFL Director) and his team launched the new Manufacturing Futures Lab on the 4th June. The MFL brings together experts from Imperial to focus on improving the UK's manufacturing technologies and processes. Research topics range from the bio-based economy and synthetic biology, through low temperature and solution processed electronics to sustainable chemistry and therapeutic products manufacture and also include product design based around new materials and advanced computing technologies that underpinning manufacture. The Lab involves researchers from the fields of chemistry, physics, materials engineering, composites, membrane technologies, control engineering, bioengineering, process systems engineering, synthetic biology, microelectronics design and management, who collectively are supported by over £100m of externally sponsored research. You can get more information on the fascinating research carried out from the MFL website: <http://www3.imperial.ac.uk/manufacturingfutureslab>

Fellow of the Royal Academy of Engineering



Professor Stratos Pistikopoulos was elected Fellow of the Royal Academy of Engineering, for his pioneering research on the development of theory, algorithms and computational tools in multi-parametric programming, explicit model based predictive control and process optimization under uncertainty. These enable process engineers to analyse and improve

their process manufacturing in terms of economics, environmental impact, energy efficiency and operability. They are also empowering the performance of clean energy system solutions (for example fuel cell systems) and intelligent drug delivery systems (for example in diabetes, anaesthesia, leukaemia) for personalized healthcare. The Fellows include some of the UK's most accomplished engineers from academia and business. Along with Prof Pistikopoulos, there were 5 other Fellows from Imperial. Sir Keith O'Nions, President & Rector of Imperial, said: "*Our Faculty of Engineering is a world beater in terms of the quality, depth and breadth of research and teaching being carried out. It is absolutely fantastic news that such a large group of Imperial academics have been recognised by the Royal Academy of Engineering. All six are leaders in their field and thoroughly deserve recognition for their outstanding contribution to engineering.*" You can find out more: www.raeng.org.uk/news/releases/shownews.htm?NewsID=876

CPSE Inaugural Lectures

Three CPSE Academics had their Inaugural Lectures: Professor Claire Adjiman, Professor Amparo Galindo and Professor Erich Muller. You might be asking what is the significance of Inaugural Lectures? Inaugural Lectures are prestigious events because it enables Universities to celebrate their new Professors. With this tradition, Imperial College has Inaugural Lecture Series and CPSE is proud to have had 3 of our academics celebrated for becoming Professors. Since, the Lectures represent a significant milestone in an academic's career, we thought you would enjoy reading about our newest professors' careers and their current and future research plans. From a social point, the Inaugural Lectures also provided an opportunity for CPSE Members, past and present, as well as, Industrial Companies to get together and engage in a joint celebration of Claire, Amparo and Erich. The date of Lazaros Papageorgiou's Inaugural Lecture is yet to be announced and we eagerly anticipate his Lecture.

For the next two newsletters, we will be featuring articles on our new Professors' journeys. We have started with Professor Claire Adjiman's story. We are sure you will find it interesting. If you have any questions you would like to ask Professors Galindo and Muller before the next publication, please email: s.selassie@imperial.ac.uk. In the mean time, you can view their Lectures on our website: <http://www3.imperial.ac.uk/centreforprocesssystemsengineering/newsandevents/inaugurallecturesvideo>

CPSE Inaugural Lecture

Professor Claire Adjiman's journey, in her own words...



Professor Claire Adjiman

When I started my academic career 15 years ago, the idea that we could integrate advanced molecular modelling techniques within process systems engineering approaches was a long way from reality. Today, we have not only shown that this can be done, but also that it can bring significant benefits, through better designs and more focussed experiments. An inaugural lecture is a great opportunity to reflect on this journey, and most importantly to thank all the people who have made it possible to turn the idea into a reality: PhD students, research associates, colleagues and collaborators. We always start from seemingly simple questions such as "what defines the best reaction medium?" or "how can we identify the best molecules to achieve a specific separation task?". Many years of hard work go into developing, implementing and testing new methodologies to answer these questions. This typically requires several PhD theses, each constituting an important piece of the puzzle. While there are a few "eureka" moments, this is mostly a story of determination and perseverance on the part of the researchers. I hope that my inaugural lecture illustrated how the efforts of many have helped us to address research challenges in a way that can be of benefit to industry and society.

If you would like to see Professor Adjiman's Inaugural Lecture, please visit our website. <http://www3.imperial.ac.uk/centreforprocesssystemsengineering>

ExxonMobil Excellence in Teaching Awards for Dr Eva Sørensen



Dr Eva Sørensen was awarded the ExxonMobil Excellence in Teaching award earlier this year. The ExxonMobil Excellence in Teaching Awards programme, designed in conjunction with the Royal Academy of Engineering (RAE), celebrates excellence in engineering teaching in the UK & Republic of Ireland, and in 2012 eight awards were made. The awards are open to university lecturers, and reward those who show a strong commitment to teaching, promote engineering as a rewarding and creative career, and establish industrial-academic links and other activities which ultimately ensure the output of top quality graduate engineers. The awardees are selected by a panel of judges consisting of ExxonMobil and RAE representatives. Through these awards, ExxonMobil continues to support excellence in engineering teaching.

Departmental PhD Research Symposium



Inês Cecílio giving her presentation

The Department of Chemical Engineering held the annual PhD Research Symposium on Friday 30th March 2013. It was a whole day event with oral and poster presentations from PhD students. Guests varied from Industrial companies, including CPSE Industrial Consortium Members, Faculty members, students and researchers. CPSE students were outstanding and did the Centre proud. Two of the **1st Prizes** for oral presentation went to **Inês Cecílio** who presented her work on "*Detection and diagnosis of disturbances across natural gas processes and the electrical utility using advanced signal analysis.*" Many congratulations to Inês who was awarded not one but two first prizes - one from the Academic and Industrial panel and one from the student vote. This was the first time in the Symposium history that student votes as well as Academic and Industrial panel decisions were the same! **Eirini Sioukrou** won **3rd Prize** for her presentation "*QM - CAMD: Advances in Computer-Aided Molecular Design of Solvents for Reactions.*" **David Garcia Münzer** was joint runner up for the poster category, 'Dynamic Cyclin Profiles as a Tool to Segregate the Cell Cycle.' with **Thapanar Suwanmajo**, "*Multisite Phosphorylations as Complex Chemical Signal Processors.*" These outstanding students were congratulated for their wonderful presentations by their supervisors: Prof Nina Thornhill, Prof Claire Adjiman and Prof Amparo Galindo, Prof Sakis Manolaris and Dr Krishnan.

Aiman Alam-Nazki (supervisor Dr Krishnan) has been selected in the AIChE Womens Initiative Committee Travel Awards Program for funding to attend AiChE. She is one of 11 persons chosen, and the only one outside the USA: <http://www.aiche.org/community/awards/womens-initiatives-committees-wic-travel-award-program>

Dr Koen van Dam has been invited to join the 'Smart Cities Interoperability Technical Committee' of the British Standards Institution.

Members of CPSE and Syngenta spent a day at Imperial discussing technical approaches to a list of topics drawn up by Syngenta. Formal presentations were kept short allowing the majority of the day to be spent on the details of potential approaches to solving a number of processing topics relevant to Syngenta. Our aim is to introduce Industry Day for all our Consortium members. We believe this interaction will enable us to better understand our members needs.

Prof Bogle is representing the UK on the European Research Area Steering Group on Human Resources and Mobility Working Group on doctoral education in Europe. This group oversees policy on doctoral education in the European Commission with impact on all EC doctoral programmes and also on national policies. He was recently a keynote speaker at a roundtable on reform of doctoral education in Central and South Eastern Europe. He continues as Chair of the League of European Research Universities (LERU) Doctoral Studies Community.

Three CPSE students won best posters in the Inaugural ChemEngDay UK conference earlier this year. This was the first of its kind in the UK and 300 participants attended the event. There were 6 categories, and CPSE students won 2 categories! Well done to Aiman Alam-Nazki (supervised by Dr Krishnan) who won the best poster in the 'Biochemical & Biomedical Engineering category. Cong Liu (jointly supervised by Dr Krishnan and Prof Xu) also won a highly commended award in the same category. Songsong Liu (supervised by Prof Lazaros Papageorgiou) won the best poster in the Process Systems Engineering category.

Dr Ioscani Jimenez del Val (supervisor Cleo Kontoravdi) won the Best Oral Presentation award at the BBSRC's Bio-processing Research Industry Club meeting on October 15 and 16.

Ioanna Stefani wrote a great article in the magazine 'A Global Village' which is Imperial's international affairs magazine. The article was titled '**Alzheimer's Disease.**' You can read her article on: <http://aglobalvillage.org/journal/issue10/ageing/alzheimers/>

Our Process Automation group attended the IEEE PES PowerTech conference in June dedicated to their Real-Smart project. They are also organising **REAL-SMART Mini-conference**, Nov 28-29 2013, which will take place in CPSE. Attendance is free though they require registration by 16 November 2013, email to: real-smart@imperial.ac.uk.

CPSE Welcomes 4 New Academics



Dr Wolfram Wiesemann, IC

Dr Wolfram Wiesemann is an Assistant Professor of Management Science and Operations at Imperial College Business School. He obtained a Joint Masters Degree in Management and Computing at Darmstadt University of Technology, Germany, in 2006, and a PhD in Operations Research at Imperial College London, UK, in 2010. 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. His current research focuses on the development of tractable computational methods for the solution of stochastic and robust optimisation problems, as well as applications in operations management, energy systems and finance.

Dr James Keirstead, IC



Dr James Keirstead is currently a Lecturer in the Department of Civil and Environmental Engineering at Imperial College London. His research focuses primarily on urban energy systems. Previously he was a Research Fellow and Team Leader of the BP Urban Energy Systems project and lead editor of the resulting book *Urban Energy Systems: An Integrated Approach* (Earthscan, 2013). Cities are home to more than half

of the world's population and in order to satisfy the social and economic goals of these populations, reliable, cost-effective, and environmentally-benign forms of Energy provision are needed. Using a range of modelling methodologies, James investigates the technological and policy options that are available to cities as they try to address these challenges. More generally, James is interested in urban resource consumption and the industrial ecology of cities. He has also worked on urban sustainability indicators, as well as UK micro-generation and domestic energy consumption issues.

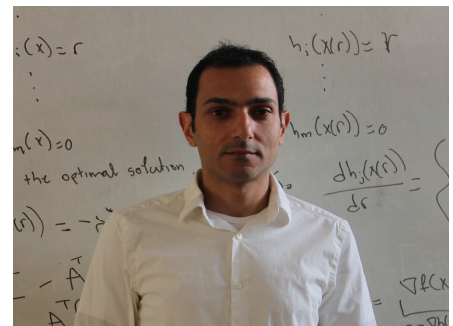
Dr Michail Stamatakis, UCL



Dr Michail Stamatakis is currently a Lecturer in University College London. He received his diploma from the National Technical University of Athens, Greece in 2004, and his PhD from Rice University, Houston, Texas in 2009. He subsequently joined the University of Delaware as a Post-doctoral researcher, performing research on multiscale modelling of catalytic phenomena on transition metal surfaces. His research is motivated by the energy problem, environmental and health issues, as well as the recent economic struggles that pose major challenges for current societies.

Catalysis can play a central role in overcoming such challenges with the discovery of materials that enable the efficient conversion of renewable feedstock into chemicals and fuels. Computational methods are currently used to aid in this process of discovery, and are envisioned to ultimately replace trial-and-error experimentation with top-up engineering approaches. Achieving this goal, however, necessitates the development of accurate methods that span a vast range of temporal and spatial scales.

Dr Panos Parpas, IC



Dr Panos Parpas is a Lecturer in the Quantitative Analysis and Decision Science (QUADS) section of the Department of Computing at Imperial College London. Before joining Imperial College he was a postdoctoral fellow at the MIT Energy Initiative (2009-2011). Before that he was a quantitative associate at Credit-Suisse (2007-2009). He completed his PhD in computational optimization at Imperial College in 2006.

Dr Parpas is interested in the development and analysis of algorithms for large scale optimisation problems. He is also interested in exploiting the structure of large scale models arising in applications. He is currently researching the use of collective variables to speed up computations that arise in molecular dynamics such as the most likely transition path between two metastable states.

CPSE says farewell to Dr Daniel Kuhn



CPSE Academic Dr Daniel Kuhn sadly left Imperial. He is now working as Associate Professor at the College of Management of Technology at EPFL where he holds the Chair of Risk Analytics and Optimization (RAO). Dr Kuhn has been with CPSE for many years and will be greatly missed. Before we say farewell, we would like to remind you of Dr Kuhn's background and let you know about his new post.

Whilst at Imperial, Dr Kuhn was a faculty member in the Department of Computing (2007-2013) and a postdoctoral research associate in the Department of Management Science and Engineering at Stanford University (2005-2006). He holds a PhD degree in Economics from University of St. Gallen and an MSc degree in Theoretical Physics from ETH Zurich. He serves on the editorial boards of several academic journals including Energy systems, Operations Research and Mathematical Programming. During his current post at the College of Management of Technology at EPFL, Dr Kuhn is working on the modeling of uncertainty, the development of efficient computational methods for the solution of stochastic and robust optimization problems and the design of approximation schemes that ensure their computational tractability. This work is primarily application-driven, the main application areas being energy systems, operations management and engineering.

Daniel, we wish you all the very best with your new post!

€2.5m ERC Grant

Professor Sakis Mantalaris has been awarded a €2.5m five year Advanced Grant by the European Research Council (ERC). Established under the EU's Seventh Research Framework Programme (FP7), the grants target distinguished researchers based in Europe.



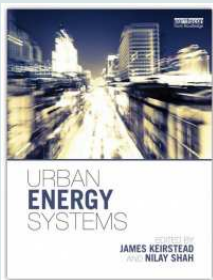
Of the five Advanced Grants awarded to Chemical Engineers in the UK since the scheme began in 2007, two have been based at CPSE (Prof Pistikopoulos and Prof Mantalaris). Collaborators on the BioBlood project include Dr Nicki Panoskaltis (Haematology) and Professor Stratos Pistikopoulos (CPSE) along with the National Blood Service. BioBlood is one of just 284 successful peer-reviewed bids from over 2,400 applications, in what is the final year of the €7.5b FP7 Programme.

Professor Mantalaris's BioBlood project broadly aims to deliver personalised healthcare - customised treatment that is tailored to the individual patient by the use of patient-specific data and cell-based therapies. Applying process systems engineering methodologies, the integration between experimentation and modelling aims to deliver a platform for the identification of optimal chemotherapy treatments that are adapted to best fit an individual patient's need. It is hoped that the project can help bring about a change in personalised medicine, specifically in the treatment of haematological cancers such as leukaemia and lymphoma.

The BioBlood project also aims at solution to the problem of blood donor shortage. In the UK alone, nearly 1 million litres of blood are transfused annually in to patients from donors, at a cost of approximately £300m. Prof. Mantalaris and colleagues have developed a novel three-dimensional bioreactor that mimics the structure and function of the body's blood factory tissue, the bone marrow.

CPSE Visitors and Visiting Professors

It was a pleasure to welcome PhD and postdoctoral visitors Anne Mai Ersdal from NTNU Trondheim, Yuanyuan Ma from ABB Oil Gas and Petrochemicals in Oslo. Anne Mai was working on frequency control of a.c. transmission when heavy industrial loads are present, while Yuanyuan was looking into signal analysis methods for time synchronization of data sets from different subsystems. It happens surprisingly often that different computers have different time on their clocks. John Pretlove, also from ABB Oil Gas and Petrochemicals, has been a Visiting Professor at Imperial for several years and his term has been extended for a further three years. John provides valuable inputs into research projects and highly entertaining lectures for undergraduate students about life in the R&D section of a business unit of an automation company.



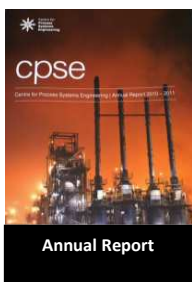
New Joint Imperial and BP Book Launch—Urban Energy Systems

Dr James Keirstead and Professor Nilay Shah launched their book titled ‘Urban Energy Systems: An Integrated Approach.’ The book brings together the major lessons learnt from a £4 million, 5-year collaborative project with BP that investigated the technologies and systems used in cities to distribute and consume energy. Understanding these systems in more detail can provide valuable insights into how to make the distribution and consumption of energy more cost effective and sustainable in cities in the future. Professor Shah, said:

“Cities use up approximately three-quarters of the world's energy and play a major role in issues such as economic security and climate change. Our book features a mix of case studies, modelling techniques, and background materials that can help the next generation of engineers and policy makers take new approaches to designing our urban energy infrastructure so that it is more efficient and has less impact on the environment.”

Power Systems Technology

A software simulator using Simulink is available at www.frecol.co.uk. FRECOL is an educational tool for long-term dynamic simulations of power system frequency control under realistic disturbance scenarios. It is implemented in MATLAB/Simulink and is aimed at power and control engineering students to practice frequency control and to test tuning and control strategies. Its relevance to CPSE is that the disturbances to the a.c. power grid are increasingly coming from process plants such as gas handling, arc furnaces and electrolysis plants that are heavy users of electricity.



President and Rector's Award

Professor Geoffrey Maitland has been awarded the 2013 President and Rector's Award for Excellence in Pastoral Care. This award is given by Imperial to outstanding individuals who have shown exemplary behaviour and actions in relation to pastoral care for students. In addition to this, Professor Maitland received 'Best Personal Tutor' Award by Chemical Engineering Undergraduates.

£6.2 Million Grant Award

Dr Cleo Kontoravdi and Professor Nilay Shah are among a team of Imperial College researchers that won a £6.2 million award from the EPSRC on Scaling up Synthetic Biology. Synthetic biology has the potential to revolutionise the way we make a host of consumer products from materials and energy to food and medicine. In order for this impact to be realised, we must find the best way to translate laboratory discoveries into operating industrial production processes. The challenge here is to transition from existing factories into the factories of the future.

Twentieth Professor Roger W.H. Sargent Lecture

Abstract: Type 1 diabetes mellitus (T1DM) is a chronic autoimmune disease affecting approximately 35 million individuals world-wide, with associated annual healthcare costs in the US estimated to be approximately \$15 billion. Current treatment requires either multiple daily insulin injections or continuous subcutaneous (SC) insulin infusion (CSII) delivered via an insulin infusion pump. Both treatment modes necessitate frequent blood glucose measurements to determine the daily insulin requirements for maintaining near-normal blood glucose levels. More than 30 years ago, the idea of an artificial endocrine pancreas for patients with type 1 diabetes mellitus (T1DM) was envisioned. The closed-loop concept consisted of an insulin syringe, a blood glucose analyzer, and a transmitter. In the ensuing years, a number of theoretical research studies were performed with numerical simulations to demonstrate the relevance of advanced process control design to the artificial pancreas, with delivery algorithms ranging from simple PID, to H-infinity, to model predictive control. With the advent of continuous glucose sensing, which reports interstitial glucose concentrations approximately every minute, and the development of hardware and algorithms to communicate with and control insulin pumps, the vision of closed-loop control of blood glucose is approaching a reality. In the last 10 years, our research group has been working with medical doctors on clinical demonstrations of feedback control algorithms for the artificial pancreas. In this talk, I will outline the difficulties inherent in controlling physiological variables, the challenges with regulatory approval of such devices, and will describe a number of process systems engineering algorithms we have tested in clinical experiments for the artificial pancreas.

Professor Roger Sargent Lecture is an annual event the Centre inaugurated as a tribute to Professor Sargent's vision, leadership, significant technical contributions and to his legacy in the field of Process Systems Engineering. This year's 20th Roger Sargent Lecture will be given by Professor Francis J. Doyle III, University of California, Santa Barbara. All are welcome and registration is not required. Lecture Theatre 1 (Room 250), Department of Chemical Engineering, ACE Extension Building, South Kensington Campus, Imperial College London SW7 2AZ.

CPSE Industrial Consortium**Members**

ABB Corporate Research
BP
Petrobras
PSE
Praxair
Procter & Gamble
Shell Research & Technology
Syngenta

Companies and organisations wishing to learn more about the CPSE Consortium membership should contact CPSE Director, Professor Nilay Shah at n.shah@imperial.ac.uk

Events

REAL-SMART Mini-conference, Nov 28-29 2013, will take place in CPSE Seminar room (RODH C615). **Attendance is free of charge** but we do require registration latest by November 16, 2013, by email to: real-smart@imperial.ac.uk.

The Twentieth Professor Roger W.H Sargent Lecture, titled “Engineering the Artificial Pancreas” will be delivered by Professor Francis J. Doyle III, University of California, Santa Barbara, Thursday 5th December 2013 at 17:30. **Attendance is free of charge and registration is not required.**

The CPSE Annual Consortium Meeting will take place on 5th and 6th December 2013. The agenda is opposite. This is strictly for **Consortium Member Companies**. To register, contact Miss Senait Selassie: s.selassie@imperial.ac.uk

For our Events, please check:
www3.imperial.ac.uk/centreforprocesssystemsengineering/newsandevents

Agenda

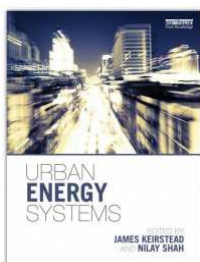
20th Professor Roger Sargent Lecture & Annual Industrial Consortium Meeting
5 - 6 December 2013

Day 1 - Thursday 5 December 2013

| | |
|---------------|---|
| 12:00 – 13:00 | Lunch |
| 13:00 – 14:30 | Poster Session Presentations, Chair: Professor Lazaros Papageorgiou |
| 14:30 – 16:30 | Poster Session |
| 16:30 – 17:30 | <i>RSL Reception</i> |
| 17:30 – 18:30 | 20 th Roger Sargent Lecture: “Engineering the Artificial Pancreas,” Professor, Francis J. Doyle III , California, Santa Barbara |
| 19:00 | <i>Dinner at 170 Queen’s Gate</i> |

Day 2 - Friday 6 December 2013

| | |
|---------------|---|
| 09:30 – 10:15 | Welcome and CPSE Overview and Highlights, Professor Nilay Shah |
| 10:15 – 10:35 | Overview of Process Operations, Professor Nina Thornhill |
| 10:35 – 10:55 | Solvent Design for Reactions, Professor Claire Adjiman |
| 10:55 – 11:10 | <i>Break</i> |
| 11:10 – 11:40 | Overview of Biological Systems Engineering, Dr Cleo Kontoravdi |
| 11:40 – 12:10 | Focus Talk: Bioprocess modelling from micro (metabolism/biocatalysis) to macro (reactor): case studies Mr Hongxing Niu |
| 12:10 – 12:30 | BP Angola Deep Water Operations – Role of System Modelling and Optimisation, Mr Prasad Sethuraman (BP) |
| 12:30 – 13:45 | <i>Lunch and Poster Judging</i> |
| 13:45 – 14:15 | Partner Recruitment Session |
| 14:15 – 14:45 | Consortium Business |
| 14:45 – 15:10 | Overview of Process Modelling and Numerical Methods, Professor David Bogle |
| 15:10 – 15:35 | Overview Molecular Systems Engineering, Professor Amparo Galindo |
| 15:20 – 15:40 | <i>Break</i> |
| 15:35 – 16:00 | Overview of Energy Systems Engineering, Professor Nilay Shah |
| 16:00 | Close |



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.