

Chemical engineering on the menu

Professor Colin Grant, Strathclyde University



Imagine for a moment if you can, receiving an invitation to a dinner party where the other guests included a Nobel Prize Winner, MIT's youngest ever full professor, the Managing Director of one of the world's biggest oil companies, a leading cardiovascular physiologist, the President of Trinidad and Tobago and a latter day crystal ball gazer who has been publicly described as "weird, wonky, wonderful and very, very useful..." An intriguing guest-list I hope you'd agree and perhaps even more so when you learn that the after-dinner conversation will focus on the future of chemical and process engineering and its potential impact on the way we might be living our lives over the next twenty years.

Professors Jean-Marie Lehn, Jackie Ying, Denis Noble, His Excellency George Maxwell Richards, Shell's Malcolm Brinded and futurologist Oliver Sparrow are the special guest speakers at the UK's biggest ever gathering of chemical and process engineers, which opens at Glasgow's Scottish Exhibition and Conference Centre (SECC) on Sunday 10th July 2005. They will be joined by 20 keynote contributors and more than 2000 visitors from 70 countries for four days of networking and discussion that will touch upon some of the biggest challenges facing mankind in the 21st Century.

Wrestling with the issues

Okay I'll come clean, it's a technical conference rather than a dinner

party. But even if it had been, I'd hazard a guess that the prospect of breaking bread with a crowd of chemical engineers might not have proved an immediate attraction – even with haggis on the menu. And yet a closer look reveals that chemical engineers are wrestling with many of the issues that preoccupy politicians, policymakers and voters in the UK and beyond. The congress programme will feature hot topics such as meeting future global energy needs, the commercialisation of nanotechnology, waste management, technological possibilities arising from the Human Genome Project, education and training and the future existence of the chemical and process industries in developed economies.

Relevant skill set

Chemical engineering is more than a hundred years old. Many people contend that the discipline came of age in 1960's and some will argue that it is now in its sunset years. IChemE hotly contests this proposition, arguing that the core chemical engineering skill set is as relevant today as it has ever been. The fundamental understanding of process design, process control and the modelling of complex systems coupled with a commitment to sustainable development finds application in many different sectors including food and drink, pharmaceuticals, energy, and biotech as well as the traditional areas of petrochemicals and oil and gas processing. Chemical engineers

can also be found at work in the financial sector, the media and even in politics where Ashok Kumar, Labour MP for Middlesbrough South and East Cleveland and IChemE Fellow has been known to fly the flag for the discipline from the benches of the House of Commons.

And yet chemical engineering is something of a Cinderella amongst the engineering disciplines. Civil engineers build bridges and roads, mechanical engineers bring us cars and trains, electrical engineers keep the lights on; but what do chemical engineers do exactly? A typical dictionary definition might be as follows, "the activity of applying chemistry to the solution of practical problems". Not entirely helpful you might think, although the last five words are worth hanging on to – solving "practical problems"; we have quite a few of those around, maybe chemical engineers can help.

Innovation and achievement

The heart of the process community, IChemE was founded in 1922 and it is true to say that the 7th World Congress of Chemical Engineering is quite simply the largest project ever undertaken by the Institution in its 83-year history. The bidding process started back in 1999, and whilst not quite on the scale of an Olympic bid, the competition was extremely strong and the UK saw off rival pitches from Spain, Italy and France to win the right to host the event. The attractions of Glasgow outshone Barcelona, Rome and

Toulouse clearly proving irresistible to the judges and I would hardly disagree. IChemE was handed a golden opportunity to highlight innovation and achievement in the discipline and, crucially, to showcase the leading role that British chemical engineers are playing in the advancement of process technology. Over the last two years 3000 abstracts have been subjected to rigorous peer review. The process yielded almost 2000 manuscripts and at the time of writing 1400 delegates have registered to attend the congress, a third of them coming from industry, dispelling the myth that events such as this are exclusively attended by academics.

Few in the science community would dispute the fact that traditional boundaries between disciplines are crashing down. As such, the congress will not be the sole preserve of chemical engineers. Other disciplines are well represented in Glasgow with major contributions from chemists, mathematicians, environmental scientists and even accountants. Her Royal Highness The Princess Royal will attend and speak in her role as official patron and the Deputy First Minister, Jim Wallace MSP, will represent the Scottish Executive. Substantial industrial backing has been secured from more than 20 leading companies with process sector interests including ABB, BASF, BOC, BNFL, BP, Foster Wheeler, GSK and Shell.

Novel agenda

In an attempt to present the diverse spectrum of chemical engineering

research in a new and more publicly accessible manner, IChemE choose to steer clear of the usual practice of pigeon holing different specialists in different parts of the programme. A commuter on the "clockwork orange", as our underground railway system is sometimes known, might glaze over at the prospect of a room full of process engineers discussing multi-phase flow or particle technology. Alternatively, tell them that the SECC is full of people thinking about ways of turning "molecules into money" or looking at "engineering for life" and you might be in with a chance of a productive conversation before they leap out at Buchanan Street.

IChemE Chief Executive, Dr. Trevor Evans, reports that the international community responded well to the challenges set out in the unusual congress themes. "The congress agenda reflects the way in which we, as chemical engineers, strive to advance fundamental understanding and translate science into viable engineering applications. Around the world we are managing complex systems and turning molecules into money without overlooking the fact that we must deploy our skills to enhance the quality of life and to deliver sustainable processes for future generations. To date we have assembled almost 1000 world-class contributions that are meeting this challenge and I am proud of the fact that UK contributors account for almost a quarter of the programme." EPSRC Chairman, Professor Dame Julia Higgins, agrees. Writing in the congress guide she says, "The novel programme has prompted chemical

engineers to think outside the box and confront the challenges presented by multidisciplinary working."

Public outreach

Away from the main programme, the congress will also feature a lively series of public outreach events including an international Chem-E-Car challenge staged in conjunction with the Glasgow Science Centre. The competition will see undergraduate teams from all over the world put their skills to the test in designing a car powered and controlled by a chemical reaction. The science centre will also be staging a series of public lectures and demonstrations to coincide with the congress. Shell are sending Michael Schumacher's F1 Ferrari for a pit-stop tyre change challenge whilst at the other end of the speed table BOC will unveil their latest record breaking fuel cell powered car.

Practical and political problems

And so the scene is set for an exciting week in Glasgow during which many of the UK's brightest engineers will rub shoulders with their international peers. The event will prove invaluable for industrialist and academics, whilst arousing more than a passing interest amongst the wider public. A dinner party it certainly won't be, although I am sure that the conference fringe will feature a prawn cocktail or two. And who knows, the answers to one or two of our more pressing practical, and dare I say political problems, may just get a first airing.

Colin Grant is the Roche Professor of Chemical Engineering and Head of Department at Glasgow's Strathclyde University. A Fellow of the Institution of Chemical Engineers, Grant will chair the 7th World Congress of Chemical Engineering, which runs from 10-14 July 2004.

For more information see www.chemengcongress2005.com



IChemE will be producing a short bullet point briefing outlining significant developments reported at the congress with implications for UK policymakers during the autumn. To request a copy please contact Suzi Mewes smewes@icheme.org.uk