

Centre for Advanced Structural Ceramics

UK centre for structural ceramics research and teaching, which aims to be world-leading and to develop links and collaborations with industrial and academic groups world-wide

MAY 2016

9TH NEWSLETTER

CASC continues its activities supported by the Industrial Consortium formed with Morgan Advanced Materials, Rolls-Royce, DSTL, Asahi Glass, Kerneos and Reaction Engines. John

Crane has joined us this year as the consortium member. More than 30 students and postdoctoral researchers working on projects funded by a variety of sources including EPSRC, EU and industry.



Morgan
Advanced Materials

AGC
ASAHI GLASS

[dstl]

Kerneos
ALUMINATE TECHNOLOGIES

john crane
the services company

ROLLS
R
ROYCE

SIXTH CASC INDUSTRY DAY

**Imperial College
London**
Centre for Advanced Structural Ceramics

CASC

SIXTH CASC INDUSTRY DAY was held on 22nd January 2016 at 58 Prince's Gate, South Kensington Campus , Imperial College, London SW7 2PG with attendees from industry and university (Morgan Advanced Materials, John Crane, CoorsTek, Kerneos, Queen Mary University). There were presentations and research posters from industrial and academic members.

The industry day was followed by the Steering Group meeting in the afternoon. The next CASC industry day will be on **23rd January 2017**. For more information about the benefits of membership of the CASC-Industry Consortium, please contact Eduardo Saiz (e.saiz@imperial.ac.uk) or Amutha Devaraj (adevaraj@imperial.ac.uk).

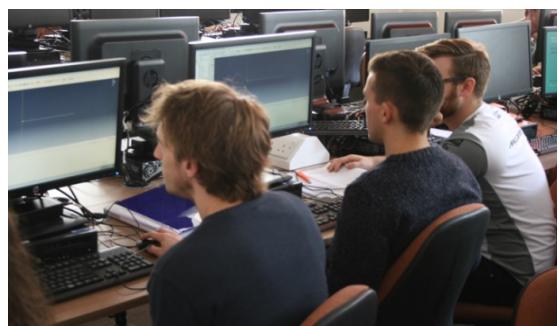
SIR RICHARD BROOK PRIZE—BEST CERAMICS PHD THESIS



The Sir Richard Brook Prize for 2015 best ceramics PhD thesis was won by **Dr Sneha Rhode**, Imperial College London. She received the accolade on the strength of her cutting-edge research into the atomic structure of ceramic nitride films. The title of her thesis is "*Atomic structure of dislocation cores in III nitride films*", supervised by Dr Shelly Moram. The prize is sponsored by Morgan Advanced Materials and it consists of a certificate, plaque and £1000 cheque. Nominations are invited for the **Professor Sir Richard Brook Prize 2016 for the best ceramics PhD thesis in the UK**. Please find more information at [Best PhD prize-flier](#). Nominations should be received by the CASC Director, Professor Eduardo Saiz (e.saiz@imperial.ac.uk) by 30 December 2016.

SIXTH CASC SUMMER SCHOOL

The Ceramic Summer School was held between 16-18 September 2015 at Imperial College London. It started with a tutorial on tailoring viscosity for colloidal shaping methods followed by a lab session demonstrating free form shaping techniques (green machining and 3D printing) and a lecture by Jonathan Phillips from Morgan Advanced Materials on Challenges and Opportunities for the Ceramic Industry. Thursday opened with a master class on modelling powder compaction process by Torsten Kraft from the Fraunhofer Institute for the Mechanics of Materials in Freiburg (Germany). This was followed by a lab session in which the effect of pressure on compact quality was studied experimentally and using finite element software.



Attendees modelling compaction

After lunch, Jianye Wang from John Crane UK discussed the ceramic materials used for mechanical seals and Raul Bermejo from the Montanuniversität Leoben (Austria) gave a master class on slow crack growth. The latter was reinforced in a lab session where the stress rate test for sensitivity to slow crack growth was carried out on glass. Finally on Friday, Luc Vandeperre from CASC introduced the use of strength statistics for designing with ceramics in an interactive tutorial with exercises.



Lunch at the end of the course

The course had attendants from Morgan Advanced Materials, Saint Gobain, the European Space Agency, a range of UK universities and an independent consultant. Feedback from the attendees was that they would all recommend the school to a colleague as they gained knowledge from expert speakers over a good range of topics and had ample networking opportunities in a relaxed environment.

SEVENTH CASC SUMMER SCHOOL

The 7th edition of the Ceramic Summer School will be held between 14-16 September 2016.

The school will be focussing on processing, characterisation and microstructural evolution of advanced structural ceramics. Please contact Finn Giuliani (f.giuliani@imperial.ac.uk) for registration and further details. A flyer with the detailed programme will be circulated soon.

PRIZES AND MEDIA MENTIONS

- ◆ **Ezra Feilden-Irving** won the Materials Today Cover Competition for his image of The solution of ceramic platelets, which will be on the front cover of the June 2016 edition and will be accompanied by a featured article in the journal. Ezra is the CASC-industry consortium sponsored PhD student working with Prof Eduardo Saiz, Dr Finn Giuliani and Dr Luc Vandeperre.
- ◆ **Dimitri Pletser** (PhD student) was awarded the Roy G. Post Foundation Scholarship, worth \$5000 in addition to all-expenses paid travel to attend the Waste Management 2016 Conference (WM2016) in Phoenix, USA. The scholarship and award were presented to him at the Awards Luncheon of WM2016, where Dimitri presented his work. Dimitri, whose research focuses on developing suitable waste forms for nuclear waste from the clean-up of Fukushima, is supervised by Prof Bill Lee.
- ◆ **Dr Victoria Garcia Rocha** is taking up the lectureship position in Composites at Cardiff School of Engineering, Cardiff University. We wish her all success in her future career.
- ◆ **Dr Luc Vandeperre** has won a President's Award for Excellence in Pastoral Care.
- ◆ **Dr Doni J Daniel** is taking up the senior lectureship position in School of Aerospace and Aircraft Engineering, Kingston University. We wish him success in his future position.

VISITORS

- ◆ Dr Cristina Botas, CIC EnergyGune, Spain is a visitor now at CASC for 4 months
- ◆ Pedro Ivo Batistel Galiote Pelissari, ETH Zurich, visiting CASC for a month
- ◆ Sylvia Stella Ramirez Caballero, INSA, Lyon, visiting CASC for two months

OUT AND ABOUT

CASC researchers have presented their work at a number of international conferences.

- ◆ BioBone symposium, Santiago de Compostela – Sept 2015
- ◆ EuroMat, Poland, September 2015
- ◆ MRS, Mexico, August 2015
- ◆ Carbon Conference, Germany, July 2015
- ◆ Additive manufacturing school (Limoges), June 2015
- ◆ MS&T, USA, Oct 2015
- ◆ Daytona conference, Jan 2016
- ◆ BioBone Industry day – Feb 2016

CASC PhDs

The following PhD students are graduated in this academic year:

- ◆ Eleonora D'Elia - Self-healing organic/inorganic composites
- ◆ Jenny Alexander - Effect of sodium on the microstructure and properties of calcium aluminate cement bonded refractories
- ◆ Amy Nommeots-Nomm - 3D printing versus foaming of melt-derived bioactive glasses for bone regeneration
- ◆ Nor Ezzaty Ahmad - Surface analysis of simulant UK high level waste glass
- ◆ Zoltan Hiezl - Processing and microstructural characterisation of a UO₂-based simulant spent nuclear fuel ceramic for UK advanced gas-cooled reactors
- ◆ Edoardo Giorgio - Processing and modelling of non-stoichiometric zirconium carbide for advanced nuclear fuel applications