



Centre for Advanced Structural Ceramics (CASC)

Imperial College
London

A UK centre for structural ceramics research and teaching, which is world-leading in this key area and is developing links with leading industrial and academic groups.

June 2017

11th Newsletter

CASC continues its activities supported by the **Industrial Consortium** formed by Morgan Advanced Materials, Asahi Glass, Reaction Engines, SAFRAN and John Crane. More than 30 students and postdoctoral researchers are working on projects funded by a variety of sources including EPSRC, EU and Industry.



REACTION ENGINES



Ceramics Summer School

The eight edition of CASC Summer School on Ceramics will take place from the **13th to the 15th of September** at Imperial College.

It will be a mixture of tutorials, lab sessions and master classes given by experts in the field. Topics that will be covered this year include: **colloidal processing, additive manufacturing, bioceramics, mechanical testing...**

We have a very interesting range of presenters coming from **Liverpool University** (Esther Garcia Tuñon), **Imperial College** (Nasrin Al Nasiri), **Morgan Advanced Materials** (Alan McLelland) and **Ceramtec** (Alan Porporati).

Registration is now open: <http://www.imperial.ac.uk/structural-ceramics/summer-school/>. This year's fees (£450) include accommodation and meals during the whole workshop.

This is a great opportunity to get hands on in different experiments and to discuss different ceramic topics with experts in the field.

Previous attendees include people from: Morgan Advanced Materials, Saint Gobain, the European Space Agency, Element Six as well as from a range of UK universities.

94% would recommend the school to a colleague, especially if in need of a refresher or relatively new to the field.

For additional information contact: Finn Giuliani (f.giuliani@imperial.ac.uk) or Alba Matas (a.matas-adams@imperial.ac.uk).



2016 Sir Richard Brook Prize Award

The 2016 Sir Richard Brook Prize was awarded to **Dr Claudio Ferraro**. This was for his research on “*Bio-inspired ceramic based composites*” under the supervision of Professor Eduardo Saiz at Imperial College.

This prize is sponsored by **Morgan Advanced Materials**, that presented the certificate, a plaque and a £1000 cheque to the winner the 20th of June at their **Armour and Brasiers meeting** at Cambridge.

The 2017 nomination will open later this year, for additional information contact: Eduardo Saiz (e.saiz@imperial.ac.uk) or Alba Matas (a.matas-adams@imperial.ac.uk).



CASC New Appointee

Qiaosong Cai joined CASC on January 2017. He did his undergraduate at East China University of Science and Technology (ECUST) China, and Postgraduate at **Sheffield University** in Materials Science and Engineering and will work on *manufacturing of porous ceramics* under the supervision of **Professor Saiz, Dr Vandeperre and Dr Giuliani**.

CASC Part of a New, Large EPSRC Programme

Manufacture using Advanced Powder Processes (MAPP)



MAPP's vision is to deliver on the promise of powder-based manufacturing processes to provide low energy, low cost, and low waste high value manufacturing route and products to secure UK manufacturing productivity and growth. MAPP will recouple manufacturing process development with the underpinning material science, with a research programme spanning the fundamentals of powder materials, advanced in-situ process monitoring and characterisation, and new approaches to modelling and control to deliver the maximum academic, technological, societal and economic impact for the UK. CASC will initially be working on producing ceramic composites via 3D printing, and fine scale characterisation techniques to develop powder descriptors.

This EPSRC project is formed by the **University of Sheffield, Imperial College London, University of Leeds, The University of Manchester and University of Oxford** and has **17 industrial partners**.

For more information visit: <https://mapp.ac.uk/> or their twitter account: <https://twitter.com/mapphub>

Further information: www.imperial.ac.uk/structural-ceramics or +44 20 7594 2053

AMITIE

Additive Manufacturing Initiative for Transnational Innovation in Europe (AMITIE)



3D Additive Manufacturing (AM) technologies and overall numerical fabrication methods have been recognized by stakeholders as the next industrial revolution bringing customers' needs and suppliers' offers closer. **AMITIE** will:

- **reinforce** EU capacities in the AM of ceramic-based products through its extensive programme of transnational and intersectoral secondments.
- **promote** fast technology transfer and enable training of AM experts.

To these aims, AMITIE brings together leading academic and industrial players in the fields of **materials science, processes, materials characterizations, AM technologies and associated numerical simulations**. Those players will develop a concept of smart factory based on 3D AM technologies and their hybridization. It will allow for the production of parts whose dimensions, shapes, functionality and assembly strategies may be tailored to address key technological issues of the fabrication of high added value objects following a combinatorial route.

The project, founded by the **EU H2020 Research Innovation Programme**, is coordinated by **Prof Fabrice Rossignol** and has **11 academic partners** and **7 industrial partners**.

For more information, please visit: <http://www.rise-amitie.eu/>.

9th International Workshop on Interfaces



The 9th edition of the Workshop on Interfaces. New Frontiers in Biomaterials, will take place in **Santiago de Compostela, Spain**, from the **16th to 18th of April 2018**.

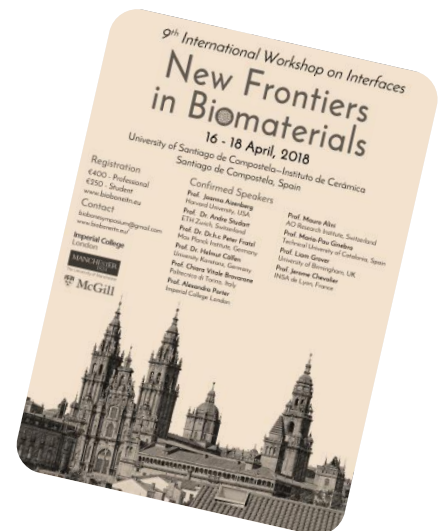
This workshop follows on from merging the past **International Workshops on Interfaces** and the first **Biobone Symposium** in 2015.

It is becoming increasingly recognized that understanding the role of structure at multiple length scales is the key for the future development of biomaterials and bio-inspired structures for functional and structural applications. In this respect, the growing diversity in processing and characterization techniques creates unique opportunities but also new challenges. Here we aim to merge the boundaries between these fields and open a platform for learning and dissemination of the latest advances.

The full programme will be available soon, but 5 keynote speakers (**Prof Joanna Aizenber, Prof Peter Fratzl, Prof André R Studart, Prof Helmut Cölfen and Prof Justin Cobb**) and 7 invited speakers (**Prof Chiara Vitale Brovarone, Prof Jérôme Chevalier, Prof Liam Grover, Prof Maria-Pau Ginebra, Prof Mauro Alini and Prof Fabrice Rossignol**) have already been confirmed.

Registration is now open at: <http://www.bioboneitn.eu/registration/>.

For additional information contact: Dr Francesca Tallia (f.tallia@imperial.ac.uk) or Dr Alba Matas (a.matas-adams@imperial.ac.uk).



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1-DRAC

The Spring **1 Day Research meeting on Advanced Ceramics** (1-DRAC), took place the **7th of April at Imperial College**.

Attendants came from academy and industry: Loughborough University, Queen Mary University of London, Oxford University, Birmingham University, Erlangen, University of Manchester, Rolls Royce, Safran, Lucideon...



Chang Su receiving the price for the UK speech competition



The meeting was organised with the support of the Ceramics Society division of **IOM3** and the help of **Margaret Wegrzyn**.

The **UK heat of the European Ceramic Society's speech competition** took place during the spring meeting. The winner was **Chang Shu** (from Birmingham University), that presented her work : "*A phase diagram study of (Ba,Ca) (Zr,Ti)O₃ piezoceramics from combining structural and functional measurements*".

1st Meeting of the UK Chapter of the American Ceramic Society

The first meeting of the UK Chapter of The American Ceramic Society was held at the Department of Materials at Imperial College London on **March 15, 2017**. The meeting had **55 attendants** and nearly half of them were from outside London (as far as St. Andrews in Scotland). This is a testament to the willingness of the UK ceramic community to participate in UK Chapter events!.

There was continuous interaction between researchers from **academia and industry** as 12 participants were from industry representing seven different companies (**Johnson Matthey, Morgan Advanced Materials, Lucideon, British Federation of Ceramics, Electrosciences, NovaMat and Nutec Bickley Kilns**). The interest of **young graduates and undergraduates** was remarkable and they represented approximately one-third of an audience with a very balanced mix of experienced and early-career researchers.



Prizes, Promotions and Media Mentions

- ✓ **Wirat Lerdprom**, PhD student supervised by Professor Bill Lee, was mentioned at ACerS and Imperial College news. They emphasized the use of his knowledge to improve water filter production in Uganda. ([Link](#))
- ✓ **Dr Omar Cedillos-Barraza** Scientific Reports work was highlighted by ACerS. ([Link](#))
- ✓ **Dr Ayan Bhowmik** got a job as a Research Fellow at Rolls-Royce@NTU Corporate Lab. We wish you the best of luck!.
- ✓ **Dr Sam Humphry-Baker** received the Imperial College Junior Research Fellowship. Congrats!.
- ✓ **Dr Vandeperre** gave a twist to this years **Design Study** classes. Four groups successfully designed and fabricated a materials processing plant. Congrats for your hard work!.
- ✓ June/July issue of the ACerS presents two articles by CASC students, **Jindaporn Juthapakdeprasert** and **Wirat Lerdprom**. Keep up with the good work!.
- ✓ We are part of **twitter** now! Visit us at: https://twitter.com/CASC_Imperial



Wirat Lerdprom during his visit to Uganda



Students explaining Dr Vandeperre their plant

CASC Diary

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|----------------------|---|
| 9-13 July 2017 | ➤ 15 th Conference & Exhibition of the European Ceramic Society, Budapest, Hungary. |
| 13-15 September 2017 | ➤ 8 th Ceramic Summer School , London, UK. |
| 17-20 September 2017 | ➤ Ultra-High Temperature Ceramics: Materials for Extreme Environment Applications IV (UHTC IV), Windsor, UK. |
| 17-22 September 2017 | ➤ European Congress and Exhibition on Advanced Materials and Processes (EUROMAT 2017), Thessaloniki, Greece. |
| 8-12 October 2017 | ➤ MS&T 17 at Pittsburgh, USA. |
| 4-7 November 2017 | ➤ 10 th international Conference on High-Performance Ceramics, Nanchang, China. |
| 30-31 January 2018 | ➤ MAPP 1st International Conference , Sheffield, UK. |

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Out and about

- 15th March 2017 ➤ **Dr Eugenio Zapata-Solvas** organised the meeting of the **UK Chapter of the American Ceramic Society**. With opening remarks from Prof Bill Lee and a talk by Dr. Amanda Quadling, from Morgan (former CASC student).
- 24th March 2017 ➤ **Ezra Feilden-Irving** gave a talk at the Young Ceramists Additive Manufacturing Forum (**yCAM**) titled “*Additive Manufacturing of Ceramic Composites*”.
- 7th April 2017 ➤ **Dr Luc Vandeperre** organised the spring **1-DRAC** meeting at Imperial College.
- 4th May 2017 ➤ **Annalisa Neri** presented a poster titled “*Collagen-Honey Films: A novel combination for the management of hard to heal wounds*” at the 27th conference on the European wound Management association (**EWMA 2017**).
- 21-26 May 2017 ➤ **Dr Laura Larrimbe** gave a talk at **PACRIM 12** titled “*Ultra High Temperature Ceramics with Controlled Porosity*”, **Dr Daniel Glymond** talked about “*Robocasting of Alumina-Alginate slurries*” and **Dr Eugenio Zapata Solvas** delivered two talks, “*Zr_{n+1}AlC_n and Zr_{n+1}SiC_n MAX phases for future fission environments: Challenges and limitations*” and “*A novel approach to the development of MeB₂ UHTCs: Improving oxidation resistance while maintaining structural performance*”.

Visitors

- **Dr Elena Xuriguera Martin** from the Universitat de Barcelona was visiting CASC from February to May and two weeks in June. The topic of her visit was the study of the rheological properties of inks for additive manufacturing (robocasting or direct ink writing).
- Professor Saiz received, in February, the visit of **Dr Adelina Braun**, Field Marketing Specialist in Materials Science at Merck.
- **Dr Wakako Araki**, from Saitama University (Japan) is visiting CASC, from March to August, to work with the Nanoindenter.
- In March, Professor Saiz received the visit of **AcerlorMittal**, to discuss the final agreement for a collaboration between their company and CASC.