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27th International Cryogenics Engineering Conference & International Cryogenic Materials Conference 2018 (ICEC-ICMC 2018)

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ICEC27 – ICMC 2018

27th International Cryogenics Engineering Conference

International Cryogenic Materials Conference 2018

September 3-7th Oxford England



Editors

Dr T Bradshaw

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On the 3-7th September 2018 we were pleased to host the 27th International Cryogenics Engineering Conference and the International Cryogenic Materials Conference 2018.

The ICEC-ICMC Conference is the Premier International Cryogenic Conference, held every two years and alternating between Asia and Europe, 'E' for Engineering and 'M' for Materials. ICEC 2 was held in Brighton in 1968, so it is 50 years since the Conference first came to England. Since 2006, ICEC & ICMC have held a joint event. ICEC25-ICEC 2014 took place in Europe at the University of Twente. ICEC26-ICMC 2016 was held in Delhi.

Though it has never been held in Oxford before, this is a natural home for the Conference, being at the centre of gravity of the strong British Cryogenic Community which has evolved out of work by renowned Cryogenic Scientists - such as Mendelssohn, whose work is commemorated in the Prize in his name, awarded at the Conference.

There were 491 delegates and 30 exhibitors.

The conference was held in the Examination Schools of the University of Oxford. This is an historic 19th century listed building in the centre of Oxford and was a magnificent venue.

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Awards and Prizes

The ICMC Lifetime Achievement Award recognizes a lifetime's achievement in advancing the knowledge of cryogenic materials through the quality and innovative nature of the recipient's work. The award also recognizes the impact the recipient has had on their field of work and their worldwide reputation.



The nomination procedure for all ICMC awards is demanding and the ICMC Awards Committee rigorously assesses all nominations. From an outstanding list of nominated persons, the recipient of the Lifetime Achievement Award 2018 is Professor Archie Campbell Emeritus Professor of Electromagnetism at the University of Cambridge Department of Engineering, UK.

Archie Campbell is recognized for his outstanding contributions over the last half century to vortex physics, AC loss, magnetization, and materials science of both high and low T_c type II superconductors.

The Cryogenic Materials Award for Excellence is intended for a person under the age of 40 at the date of the conference, to recognize his or her excellence in advancing the knowledge of cryogenic materials over recent years. The award is based on the innovative nature and impact the awardee has had on their field of work, together with the International reputation the awardee has gained in recent times. From a strong field of possible contenders for this award, the ICMC Awards Committee found two exceptional candidates, both well deserving of this award. Therefore, exceptionally, ICMC has made two awards in this category. The two awardees are Dr. Anna Kario and Assoc. Prof. Akiyasu Yamamoto.



Dr. Anna Kario from the Karlsruhe Institute of Technology (KIT), Germany

Anna Kario is recognized for her pioneering development of advanced REBCO Roebel cables.



Akiyasu Yamamoto, Associate Professor Tokyo University of Agriculture and Technology, Tokyo, Japan

Aki Yamamoto is recognized for his research on MgB_2 and Fe-based superconductors, in particular $BaFe_2As_2$.

The Mendelssohn Award ICEC sponsors the Mendelssohn Award, presented to an outstanding person on the occasion of each ICEC Conference, selected by their work in cryogenic engineering.

The Award was established in memory of Kurt Mendelssohn (1906-1982), founder of the ICEC committee.



The recipient of the 2018 Mendelssohn Award is Professor Fons de Waele of Eindhoven University. During his extensive career, Fons has truly made an outstanding contribution in cryogenics, in research, teaching, training, mentoring, advising, writing and organising events at home and abroad. Previous Award winners, including Sir Martin Wood and Professor Ralph Scurlock from UK can be found on the ICEC website.

The Klipping Award The International Cryogenic Engineering Committee awards a young (max 35 years) researcher for outstanding work in cryogenic engineering. The award is named after Gustav and Ingrid Klipping to commemorate their enormous contributions to the field of cryogenics and more specifically to recognize their active role in involving young researchers.



The 2018 winner of the Gustav & Ingrid Klipping Award is Dr Jingyuan Xu, from the Technical Institute of Physics & Chemistry at the Chinese Academy of Science in Beijing. Dr Xu was an outstanding candidate, with an extremely impressive CV, recording formidable achievements by every measure, be it patents or publications or participation in conferences. Dr Xu spent “post-Doc” time at the University of Cambridge following the conference.

Previous Award winners are: Y. Huang, H. Cao.

Editorial

Thank you Oxford! We had 491 delegates at the Conference in September. Delegates truly enjoyed Oxford and were inclined to forgive us any shortcomings. The weather was kind as well! The combination of the Sheldonian Theatre, Examination Schools & Town Hall did us proud and proved to be excellent venues. Events specialist Archer-Yates were outstanding in their guidance & support.

The Opening Ceremony took place in the Sheldonian Theatre, appropriately the University's official ceremonial hall. Professors Ian Shipsey, Head of Physics at the University and Neil Geddes, now Head of STFC National Laboratories welcomed the conference. Prior to presentation of the Mendelssohn Prize to Professor Fons de Waele by ICEC Chairman Marcel ter Brake and previous winner Professor Ralph Scurlock. Professor Stephen Blundell from the Clarendon Laboratory spoke on Mendelssohn and his time in Oxford. The ICMC Lifetime Achievement and Awards for Excellence were presented by Professors David Evans and David Cardwell. Member of Parliament Ed Vaizey rounded off this part of the proceedings with a Goodwill Message to the Conference, reflecting the local importance of Cryogenics to business in the area.

And so to the Examination Schools, the largest venue in the city centre, built in the 1880s to house the University's examinations, and our anchor location, accommodating the plenary talks, parallel conference tracks, exhibitors, poster sessions and catering. As Mendelssohn Prize Winner, Professor Fons de Waele gave a plenary talk titled "Challenges in Cryocooling." The plenary sessions were masterful. Barry Fuller's talk : "Stopping the Biological Clock" brought biology and cryogenics together in the field of Applied Cryobiology. Oxford Alumnus Glyn Kirby opened his talk on Next Generation Materials for Future Magnet Development at CERN with a slide from memory lane featuring his favourite old Oxford haunts as a student. Neil Mitchell from ITER spoke on Lessons Learned from the ITER Magnets in Materials Development and Industrialisation and Tiemo Winkler from the University of Twente spoke on the EcoSwing superconducting wind turbine project.

To accommodate all the components of the conference, a marquee was constructed outside in the Examination Schools quad, housing a number of exhibitors, poster sessions, and a superconducting levitation demonstration staged by the University of Cambridge. Other than for Oxford alumni with bad memories of student exams, the Examination Schools had great appeal for delegates. The Examination Schools also proved an enjoyable venue for the Exhibitor Reception held there on the Tuesday evening.

The conference included two other social occasions, held in the Town Hall, the scene of the BCC 50th Jubilee Birthday celebrations in May 2017. A Welcome Reception was held on the Monday preceding the conference and a farewell dinner on Thursday evening. The dinner was sold out - and diners treated to entertainment in the form of "singing waiters" - opera singers disguised as staff who feigned an incident and broke into spontaneous song ! During the "free" evening on Wednesday, some of the sponsors found other venues to their liking for their own receptions, ranging from a very traditional English pub [Air Liquide in the Kings Arms] to a stylish boutique hotel [Linde in the converted Victorian prison which is now the Malmaison Hotel].

Four optional technical visits took place on the Friday, with one party leaving on foot for a visit to Oxford University, while three coaches set off in different directions - one to visit local industry in the form of Oxford Instruments and Polar Technology (occupying Oxford Instruments' former

headquarters in Eynsham). Another went to visit “Science Vale,” calling at the JET Fusion Reactor at Culham, and passing the Oxfordshire UTC (the world’s first High School with its own Lab teaching Cryogenics) en route to Rutherford Appleton Laboratory on the Harwell Campus. The third coach went furthest - to Birmingham University, home to a Laboratory for the Dearman Engine, and a pilot Liquid Air Energy Storage Plant. Not everyone could get on the trips they wanted, so we take this opportunity to apologise and invite anyone back for a visit another time.

Student accommodation was made available from a number of colleges within walking distance of the venues. One example was in “New College” [new in 1379 !]. Delegates who chose to stay there had the pleasure of eating breakfast in a Dining Hall reminiscent of Harry Potter’s Hogwarts. Thank you again Oxford, the weather - and everyone who took part in making this special occasion.

John Vandore



The Organising Committee

Categories

For the International Cryogenic Engineering Conference

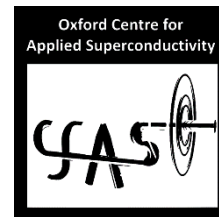
- E-01: Large scale refrigeration, liquefaction, air separation and industrial cryogenics
- E-02: Cryocoolers: Pulse tube, GM, Stirling, Magnetic and other coolers
- E-03: Expanders, cryo-pumps, compressors, regenerators and other components
- E-04: Space cryogenic applications
- E-05: Cryostat technology and thermal insulation
- E-06: Thermo-physical properties of solids and fluids in cryo-systems
- E-07: Magnet technology, design and evaluation
- E-08: Large scale cryogenics: fusion reactors, accelerators, superconducting cavities and detectors
- E-09: Low temperature refrigeration for quantum computers, detectors and LT experiments
- E-10: Superconducting current leads and links
- E-11: Cryogenics for power applications and transportation
- E-12: Various applications of superconductors
- E-13: LNG and hydrogen systems
- E-14: New devices and novel concepts
- E-15: Biological, medical and food applications
- E-16: Instrumentation, telemetry and process control
- E-17: Safety, reliability and standards

For the International Cryogenic Materials Conference

- M-01: Processing and properties NbTi/Nb₃Sn/A15/RE123/BSCCO and MgB₂
- M-02: Pnictides and other superconducting materials
- M-03: Superconductor stability, AC losses and electromagnetic properties
- M-04: HTS Bulk, thin films and cables
- M-05: Flux pinning and critical current
- M-06: Metallic, composite materials, insulation and impregnation materials processing and properties
- M-07: Cryogenic materials testing and methods
- M-08: New cryogenic materials properties and applications
- M-09: Cryogenic low and high power electronics, superconducting detectors
- M-10: Radiation and other degradation effects
- M-11: Heat transfer, thermodynamic and fluid properties of cryogenic materials
- S-01: Material requirements for advanced HTS magnets

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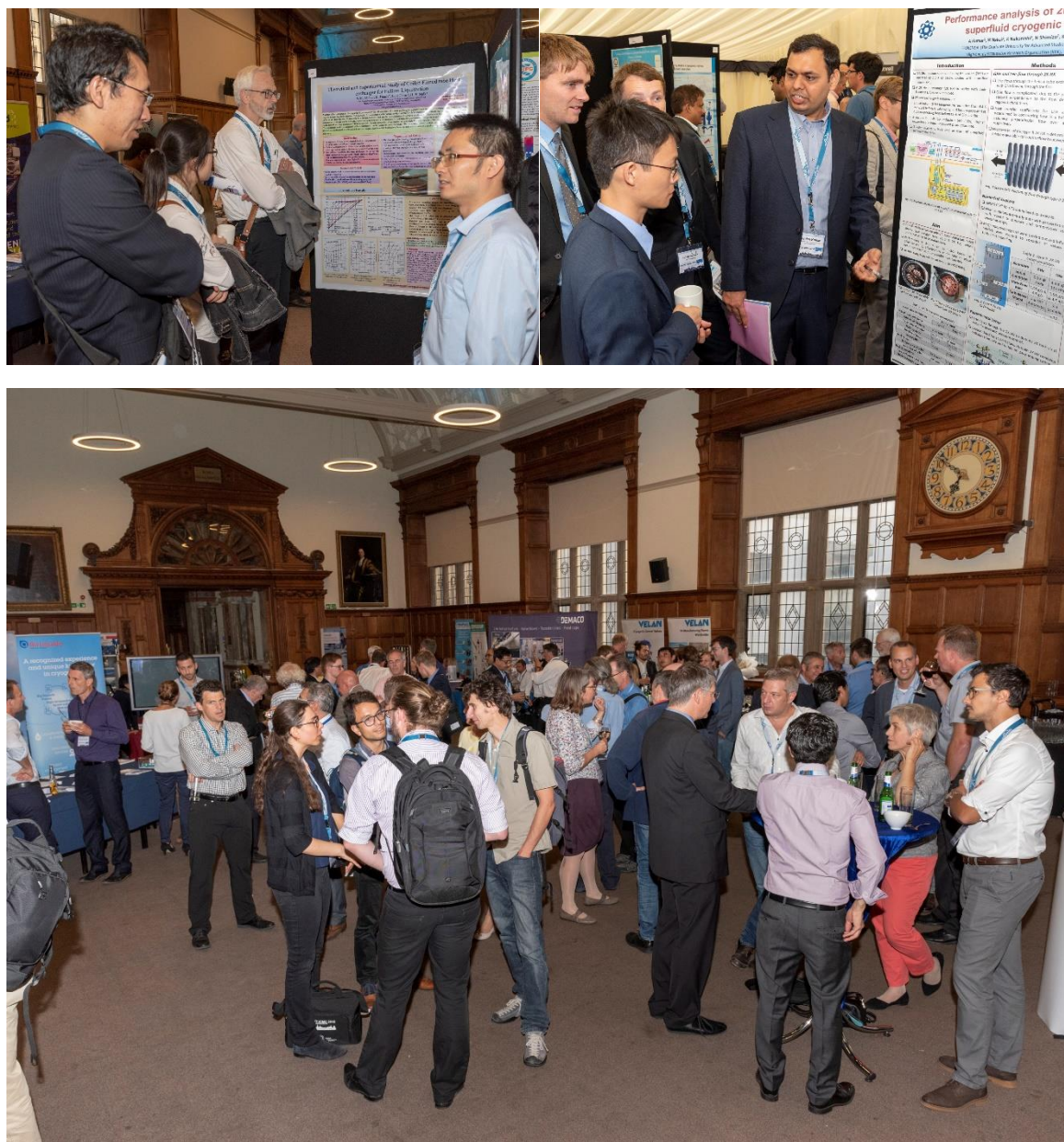
Conference Highlights



Opening remarks in the Sheldonian



Oxford Town Hall Reception



Poster Sessions in the Examination Halls