From the CM-DTC Director - Prof Andy Mackenzie

It is a pleasure to provide an update on the excellent progress of the CM-DTC. Summary statistics are that by September 2011 the DTC will host over thirty high-achieving PhD students, all of whom joined us with first class honours or equivalent degrees; will have hosted two Summer Schools attended not just by our students but also by others from the UK, Canada and Japan; will have consolidated our Industrial Associate programme as part of our objective of forging links outside academia, receiving positive feedback on events that we have run. The critical mass in condensed matter physics established by the Centre has contributed to success in securing major research grants that will underpin the environment in which our students work. Of particular note in the last 12 months is a £6.8M EPSRC Programme Grant for research into ‘topological and non-equilibrium states’ awarded to St Andrews and Edinburgh Universities along with a colleague at Oxford University and a £0.9M EPSRC Platform Grant awarded to the Centre for Science at Extreme Conditions in Edinburgh that will link research in Physics with Chemistry and Engineering. These are exciting times for CM-DTC and for condensed matter physics in Scotland. We hope this newsletter conveys some of the vibrancy of the Centre.

Upcoming event: The 2011 CM-DTC Summer School

We are running a residential summer school focussing on applications of condensed matter to the energy sector, 20-27 August 2011. Topics include Fusion, Fission, Fuel Cells, Solar and Thermoelectric materials. Lecturers include:

- Professor Graeme Ackland (SUPA, University of Edinburgh)
- Professor Peter Bruce, FRS (EaStCHEM, University of St Andrews)
- Dr Paul Clegg (SUPA, University of Edinburgh)
- Professor Peter Littlewood, FRS (University of Cambridge)
- Professor Zhi-Xun Shen (Director, Stanford Institute for Materials & Energy Science and Geballe Laboratory for Advanced Materials, Stanford University, USA)
- Dr Graham Turnbull (SUPA, University of St Andrews)
- Dr Anthony Webster, Dr Lee Packer and Dr Steve Fitzgerald (Culham Centre for Fusion Energy)
- Professor John Wilson (SUPA, Heriot-Watt University)

A full programme can be found at [http://cm-dtc.supa.ac.uk/news_events/index.php](http://cm-dtc.supa.ac.uk/news_events/index.php). External postgraduate students and researchers may apply to attend the school. For more details, including of a limited number of bursaries please contact Christine (cae10@st-andrews.ac.uk).

From the CM-DTC Director of Training - Dr Chris Hooley

As we come to the end of our second year of taught courses, things are going well. Thanks to very useful feedback on the first year from both students and staff we have made various improvements, and this year's programme was a good mix of regular and "one-off" courses. Some of the latter were given by prestigious visiting academics: in late April and early May, Professor Stephen Blundell (Oxford) gave a well-received six-lecture course on Magnetism, and in May SUPA Distinguished Visitor Dr Chris Stock contributed six lectures to our Probes of Condensed Matter course. We were delighted that both of these visitors joined us at the Burn House for the CM-DTC’s annual retreat (see below).

We shouldn't forget our local prestigious academics either, of course! One such is Professor Mike Cates, who during the autumn semester led a reading course on Chaikin and Lubensky's 'Principles of Condensed Matter Physics', which was widely regarded as a rewarding and academically rigorous exercise. In another innovation, Dr Paul Clegg opened a workshop he was organising to students on the Probes of Condensed Matter course, giving hands-on experience with the kind of imaging equipment used in soft condensed matter research.

The smooth administration of the student programme is no small task and we are indebted to colleagues in SUPA for their invaluable support. With a good template in place, and most of the courses now developed, we look forward to providing high quality condensed matter education for the 2011 intake and beyond.

Retreat at 'The Burn' – 2011 (April 27-29)

This was a residential retreat for CM-DTC students at The Burn estate, near Edzell. The activities programme was organised by CM-DTC students and included presentations by students on current research, as well as talks by senior members of staff. A debating seminar and an outreach meeting rounded off the program, leaving sufficient time to take advantage of the Burn's extensive grounds and sporting equipment. Many discussions continued outside and led to new insight as well as new collaborations.
Industrial Associates programme – Prof Andrew Huxley

The ‘Careers Event’, advertised in the last newsletter took place on Thursday 10 March 2011, in Lower College Hall, St Andrews with speakers from Accelrys Ltd, Barrie & Hibbert, Cairn Energy plc, Element Six Technologies, Nature Publishing Group, Rhodia, and SELEX Galileo. Talks covered the personal experiences of physicists in different careers, conveying the excitement of their work. A poster session allowed discussion of students’ research and Dr Ian Osborne from Science magazine presented a prize for the best student poster. The event was followed by a dinner. Feedback on the event from both students and Associates was very positive; the students came away feeling they had learnt about alternative career options and the Associates commented on the enthusiasm of the students and contacts made. We plan to build on the success of this event with a similar meeting in 2012/13 coinciding with the first cohort of students entering their final year.

In addition to the above event, several Associates made presentations to our students at their regular meetings, including Dr Alan Faichney (CEO, Edinburgh Instruments) who spoke on R+D led businesses and Dr Ian Osborne (Science magazine) who gave a presentation on scientific ethics. We are looking forward to a series of lectures from Culham fusion research scientists at the forthcoming summer school. As well as hosting further such visits we hope to welcome several new Associates to our programme in the coming months.

Outreach – Outreach Leader, Anne-Claire Pawsey

Over the course of the year the DTC students have participated in a wide variety of outreach events. The principle event was ‘Meet the Scientist’, hosted at the National Museum of Scotland. It took place during the two May bank holiday weekends and involved all of the DTC students. The activities themselves consisted of a variety of hands on demonstrations based on research in the DTC, punctuated by short talks given by students. Over the course of the two weekends the students spoke to over 1000 people, used up 15 rolls of sticky tape, helped to build over 400 spectrometers and gave 30 talks. The age range of the audience was huge, from 2 upwards, and the students had to rise to the challenge of explaining subjects as diverse as ultra cold atomic gasses, the electron transport properties of graphene and the basics of spectroscopy to this extremely varied and demanding group. Visitors commented that the activities were “fun and really visually interesting.” The students found the experience enjoyable and exhausting in equal measure.

Edinburgh based students (from the University of Edinburgh and Heriot-Watt University) have also been working with the science club from Liberton High School. Over the course of the term we have built up relationships with the students and taught them more about our research and how science works using demonstration experiments, equipped with a supply of Slinkies and Lego spectrometers. Bill Harris, the teacher in charge of the club has enjoyed seeing the relationship develop: “The dialogue between each set of students has increased; sharing and discussing theories and experimenting with models to explain the observations and experiments that the PhD students have organised. This has indeed promoted science as a human endeavour, not the typical images of scientists in white coats that many young people hold. It is a joy to see these young people working so well together.” The DTC students have enjoyed working with the club and intend to go back next year.

For further information on the CM-DTC please contact:

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