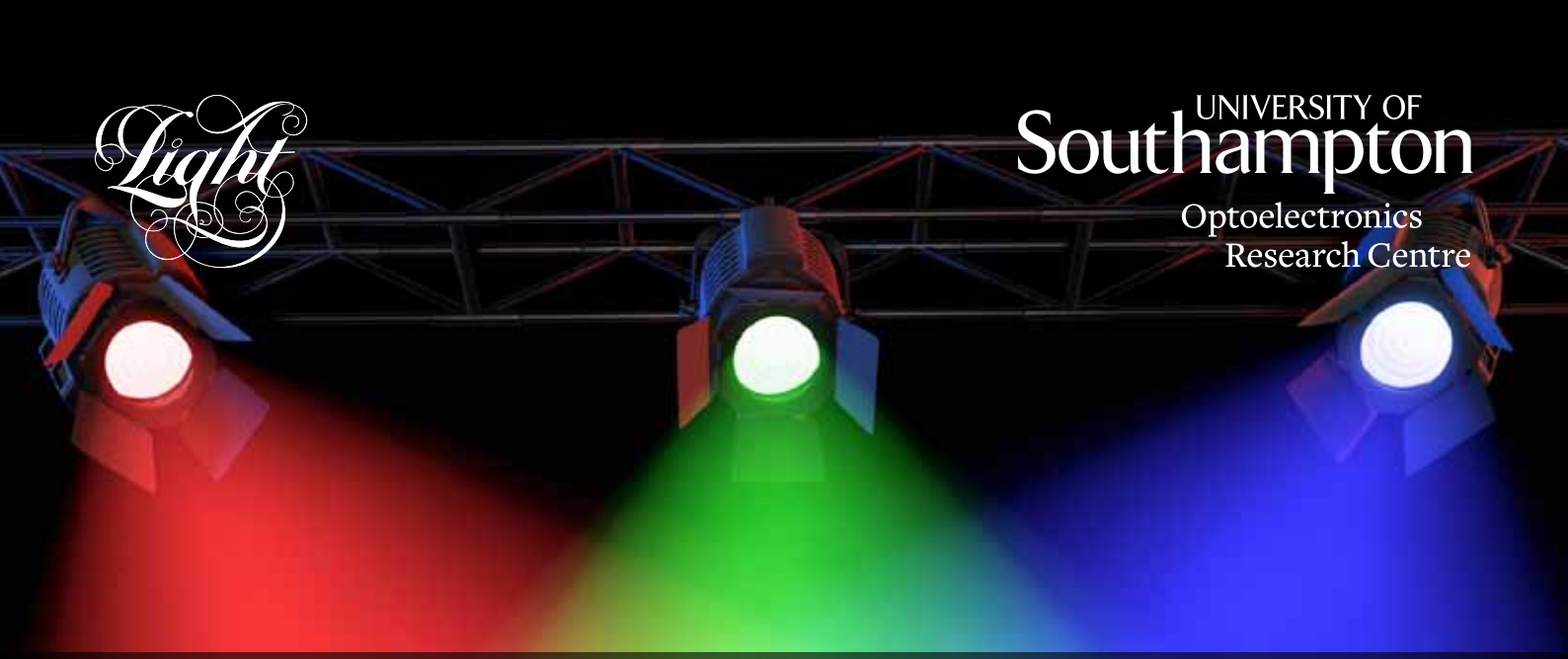


UNIVERSITY OF Southampton
Optoelectronics Research Centre

January 2009

Student Spotlight

Welcome to the first edition of our new magazine for prospective students!

It's an exciting time for the students at the ORC, having recently moved into a brand new state of the art building the students are now looking forward to the installation of brand new labs and clean rooms as well as upgrades to some of the existing ORC labs.

$1000 OSA grant awarded to ORC Student

ORC PhD student Paul Hoy was recently awarded one of the Incubic/Milton Chang grants for $1000 from the Optical Society of America (OSA) to present his paper entitled "Optical Intraoperative Measurement of Function in the Human Brain" at the OSA Annual Meeting and the 29th Conference on Lasers and Electro Optics taking place in Baltimore, USA in 2009.

ORC staff and students move into new building

October 30th 2008 marked the third anniversary of the fire that destroyed the Mountbatten research facilities. Now, three years later, staff and students at the ORC have moved into the new Mountbatten building.

Home to one of Europe's leading multidisciplinary and state-of-the-art clean room complexes, the new multi-million pound Mountbatten building stands proudly in the same spot as its predecessor. Architecturally the building is bold and modern; with glass curtain walls - graced by a mathematical fractal pattern -allowing passers-by to view the researchers at work in the clean rooms.

Fitting out of the new ORC lab and clean room facilities is under way and due for completion in spring 2009.

ORC Director Professor David Payne said "I am very excited at the prospect of getting our laboratories back after three years of making-do in temporary facilities. This magnificent clean room building is unique and world-leading in its imaginative vision for integration of nanoscience, photonics and optical fibre technology. With the devastating fire well and truly behind us, we can now rapidly rebuild our reputation as the foremost photonics centre in the world."

"The new building has literally risen like a phoenix from the ashes of its predecessor," said Head of ECS, Professor Harvey Rutt "It provides the environment and facilities that will enable us to carry out fundamental and transformative research at the nanoscale and our cleanrooms will enable us to forge new partnerships with companies working at the leading edge of technology. It fully realizes the University's commitment made the day after the fire, to ensure that our research would continue in even better and more appropriate surroundings."

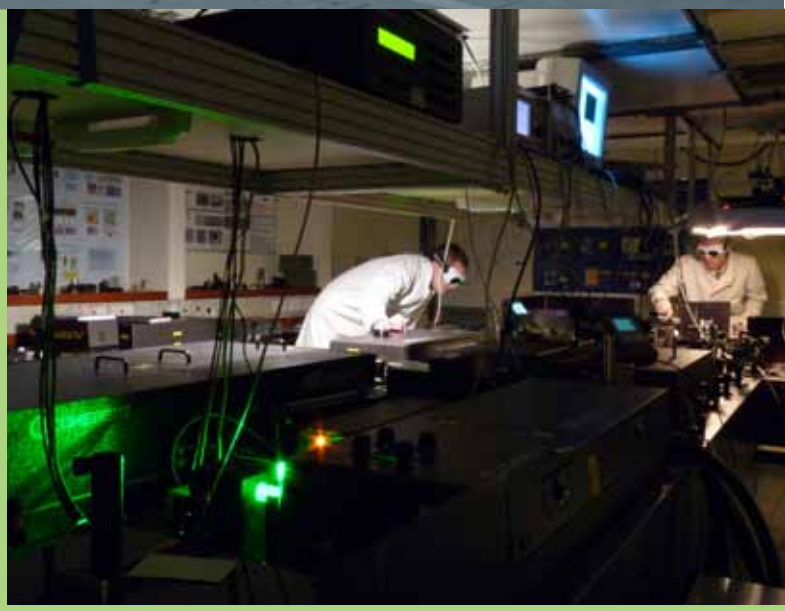
After the fire, Vice Chancellor Professor Bill Wakeham spoke of his commitment to rebuild Mountbatten, and on the anniversary of the fire he commented "We have been able to fulfil my promise made three years ago. Staff and students are starting to move in to this stunning new facility and I look forward to seeing the positive impact that this will have on their world-leading research."

ORC to invest £300K for FAST lab upgrade

The ORC will be investing approximately £300K over the next few months adding new equipment to the centre's multi - user, Femtosecond Applications of Science and Technology (FAST) lab, allowing a variety of ultrafast experiments to be performed.

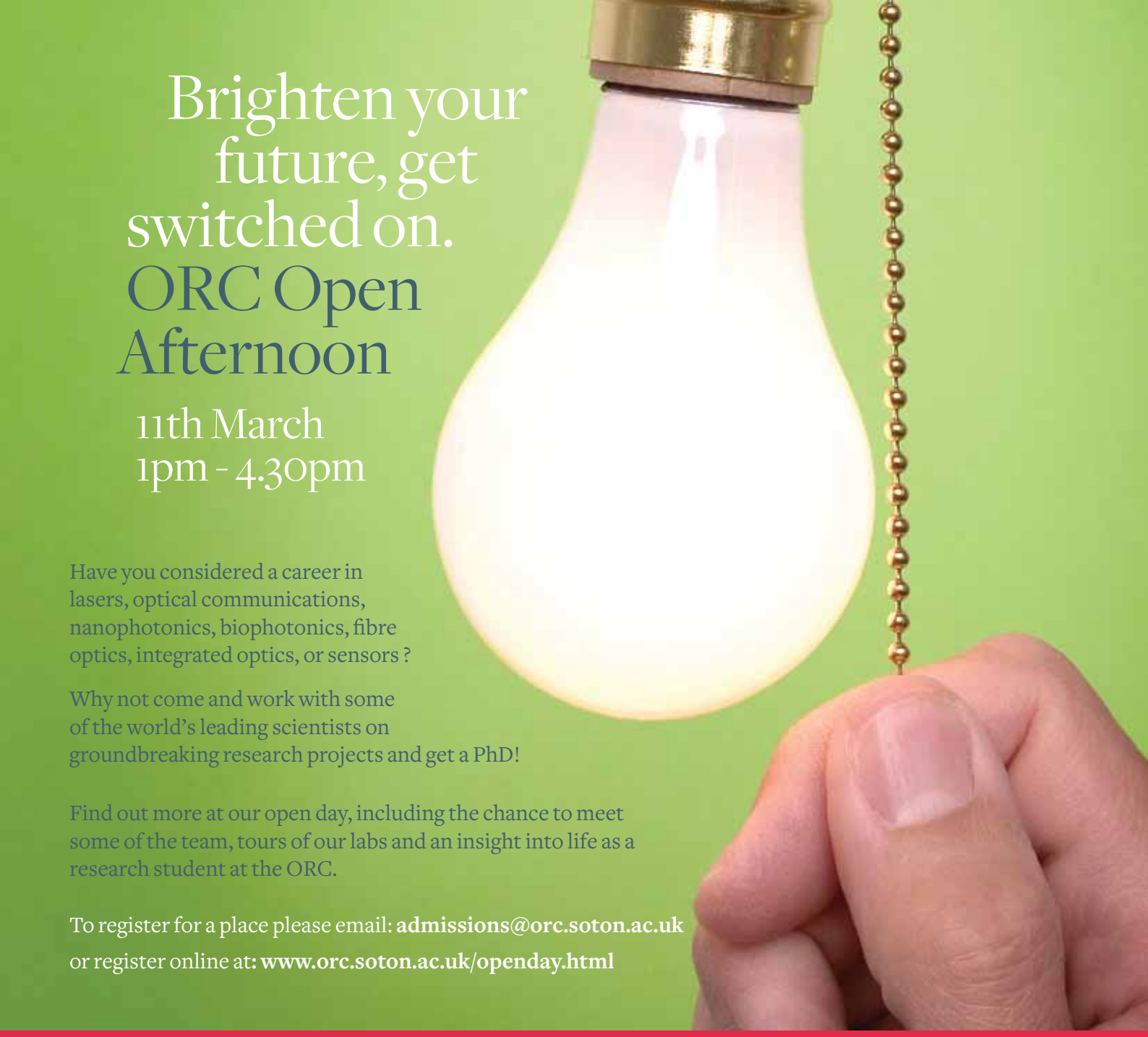
The FAST lab was first opened back in 2004 costing £1.1M, providing the most comprehensive and flexible commercial ultrafast laser system in the world. Now four years on ORC Director, Professor David Payne has allocated money through the ORC's strategic initiatives to purchase new equipment for the lab, enabling researchers to enter new areas of research.

The new improved FAST lab will now have 2 – 3 separate areas allowing users to work simultaneously, and adding some significant new facilities that will allow Terahertz measurements, pump-probe spectroscopy, and non linear microscopy. Facilities for work with biological samples will also be significantly enhanced and will help to expand the biophotonics work carried out by the centre's research team.



"This is a really exciting time for us; the investment into the lab will allow us to move into new areas and new collaborations, and open up external funding opportunities" said Dr Bill Brocklesby.

FAST lab manager, Dr David Banks said: "Thanks to the funding from the ORC's strategic initiatives, we will now be able to better exploit the capabilities of the FAST lab laser system. Alongside partitioning of the lab into separate working areas so that we can finally realise the multi- user femtosecond facility that has long been called for, a number of new resources will be added."



Brighten your future, get switched on. ORC Open Afternoon

11th March
1pm - 4.30pm

Have you considered a career in lasers, optical communications, nanophotonics, biophotonics, fibre optics, integrated optics, or sensors ?

Why not come and work with some of the world's leading scientists on groundbreaking research projects and get a PhD!

Find out more at our open day, including the chance to meet some of the team, tours of our labs and an insight into life as a research student at the ORC.

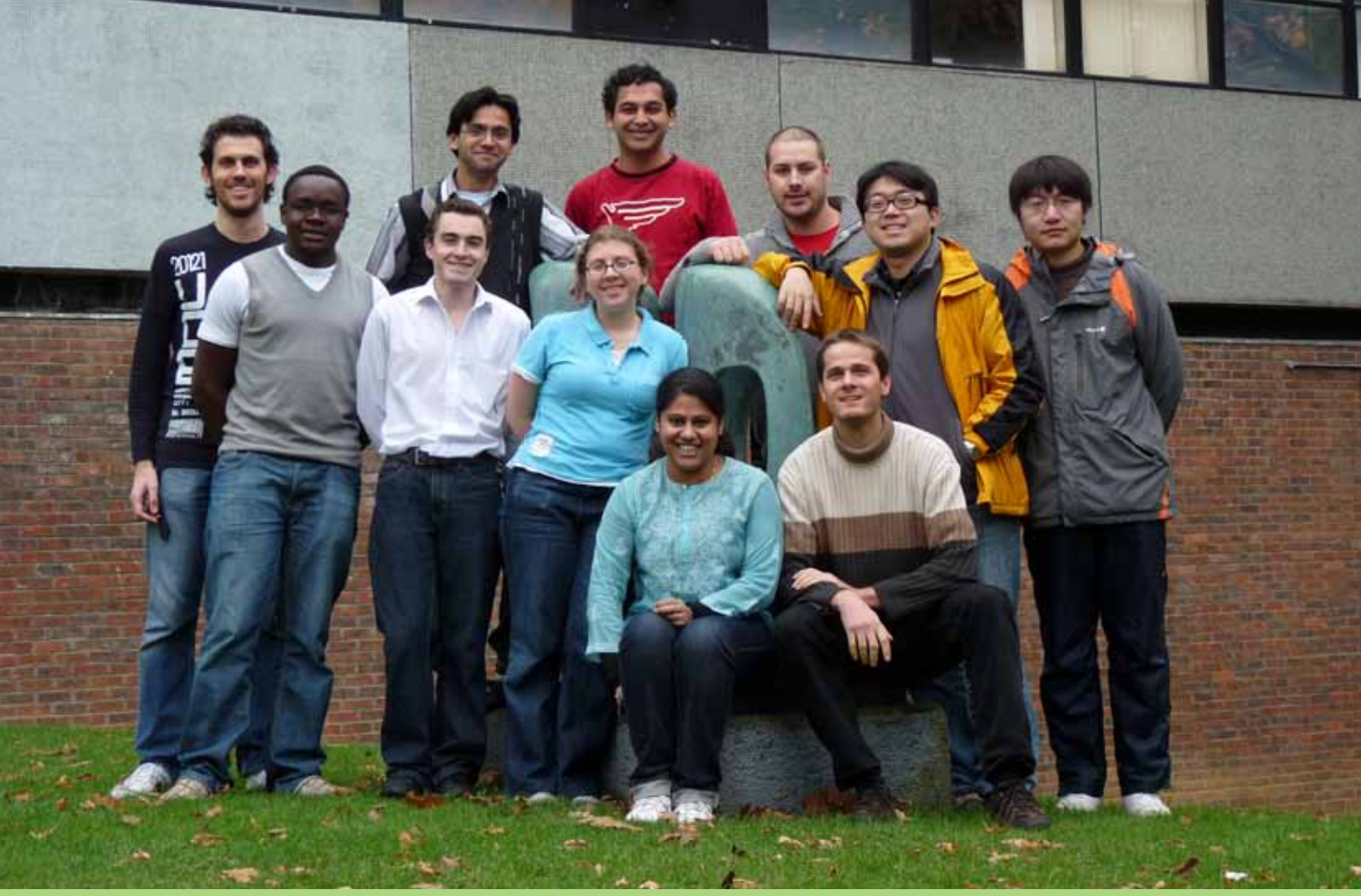
To register for a place please email: **admissions@orc.soton.ac.uk**
or register online at: **www.orc.soton.ac.uk/openday.html**

Research highlighted by top physics journal

A group of researchers at the ORC recently had their work highlighted as an "Editor's suggestion" by Physical Review B.

The paper entitled "Metamaterial with Negative Index due to Chirality", demonstrates for the first time chirality-induced negative refraction.

By creating a metamaterial consisting of layered, flat, mutually twisted metal patterns, the group including PhD student Eric Plum, Dr. Vassili Fedotov and Professor Nikolay Zheludev from the ORC have realized an artificial structure that can rotate the polarization state of light in a similar way to natural chiral materials such as quartz and sugar solution. However, the polarization rotation occurring between the two layers of the group's artificial structure is a million times stronger than in quartz, leading to a negative index of refraction for one circular polarization. This discovery constitutes an important step towards the miniaturization of polarization control elements for microwave and optoelectronic applications and the realization of super-resolution imaging and data storage applications.



Introducing the OSA student chapter

The University of Southampton Student Chapter of the Optical Society of America (OSA) was established by research students at the ORC in 1994, making it the first ever international student chapter.

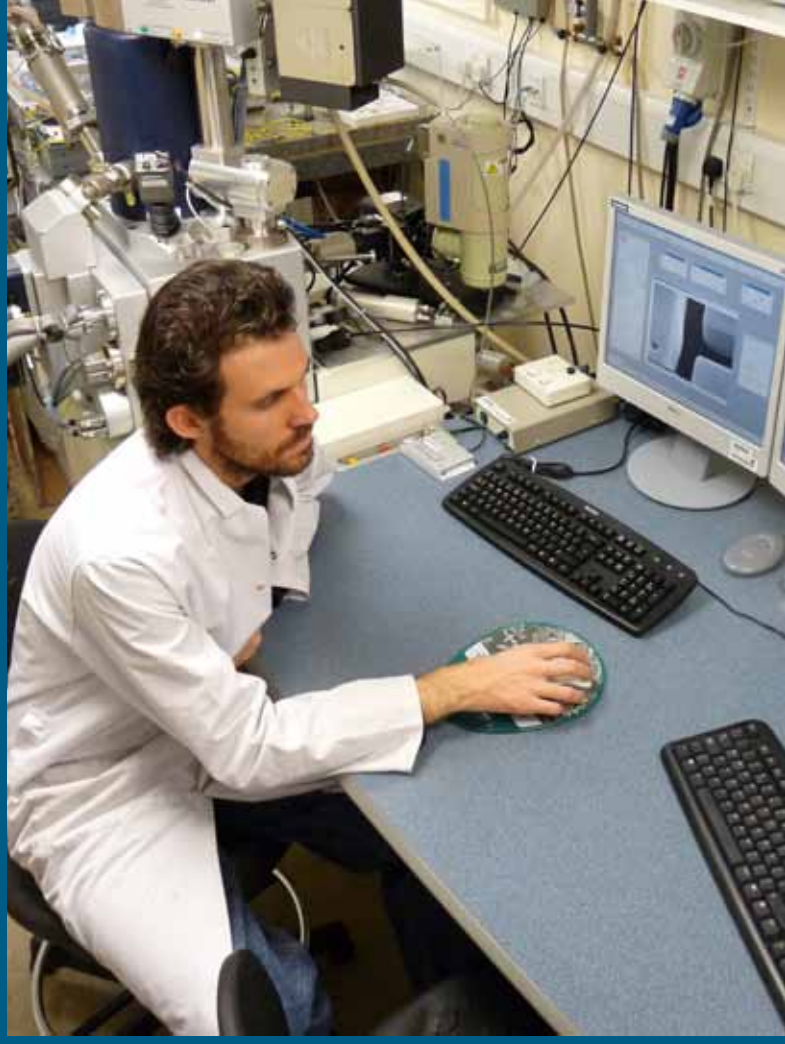
The OSA Chapter was initiated to help to increase the involvement of research students in the activities of the ORC and to enhance communication of new findings both to internal and external audiences. The student chapter encourages social activities arranged by the committee that enhance members' working relationships and provides a break from the hard work of scientific research.

Headed by President Giorgio Adamo, the current OSA committee (pictured above) consists of Vice President, Kamalpreet Kaur; Treasurer, Florian Kienle; SUSU Representative, Gysbert von der Westhuizen; Graduate Students Ambassador, Salman Ghafoor; Lightwave Directors, Kristian Thaller and Kate Sloyan; Social Representative, Mohammad Belal; 1st Year Representative, Joseph Kakande; Web Developer, Tsung Sheng Kao and finally Sports Representative Charlie Ying.

The student chapter committee organises a range of activities over the year, including:

- Internal and external seminar series
- Technical visits
- Working with schools to help improve the public understanding of optics
- Social Events for the chapter's members
- Careers presentations
- Workshops that draw on the expertise of ORC staff
- Publicity events for both the ORC and the University of Southampton

OSA student chapter President, Giorgio Adamo gives an insight into life as a PhD student at the ORC



"I studied for my degree in Milan, during this period I spent two years in Stockholm studying a double degree programme. After completing my masters I spent nearly two years working in research for Pirelli Labs in Italy; however I was feeling the push towards the experience of a PhD related to Physics.

I believe it was my previous experience in Stockholm that gave me the drive to look for a PhD abroad, so I started surfing the Internet looking for PhD offers and that's how I came across the ORC PhD programme literally by chance. I contacted the admissions team who were very helpful and asked me to come for a visit. I really liked the place so I decided to apply.

The ORC seemed to be a very friendly place, well organised, with an extremely motivating working environment; I can say now that I was right and this motivates me to work hard. Moreover, the research at the ORC spans such a broad range of topics that there are plenty of opportunities to learn about different areas of photonics, e.g. through the seminar series.

"Collaborative work with international research groups has allowed me to gain some really good contacts from around the world."

The staff here are really supportive, and provide a good service - you can always find someone to help you or redirect you to the correct person. My work is well supervised, I meet with my supervisor twice a week to talk over my progress and any problems that I have. Even though it may look scary to have such "control" I can tell you that it helps a lot in keeping your progress on track!

Social life at the ORC is another great aspect; you can find a large number of friendly students to hang around with who are willing to have as much fun as you are. Furthermore the ORC hosts a quite large graduate society, the OSA Student Chapter, which works hard to organise a series of social events involving ORC students and staff. The main social event is the OSA Arctic BBQ, last year it was very cold but was still a lot of fun!

The best thing about the ORC is its international character; internally there is a broad range of people from all over the world and externally collaborative work with international research groups has allowed me to gain some really good contacts from around the world.

I wouldn't say there was anything bad about being a student here both work and life-wise!

If you are interested in photonics I recommend that you come to the ORC. It's a great place to do a PhD, the University itself is quite big and the social atmosphere on campus is great."

OSA student chapter Vice President PhD student Kamalpreet Kaur talks about her time at the ORC

"After completing my schooling I took a BSc and MSc in Physics at Guru Nanak Dev University (G.N.D.U) Amritsar, India. I then completed a Master of Technology (M.Tech) in Applied Optics from the Indian Institute of Technology Delhi (IITD), India. I went on to work in the Micro-Optics research group of Prof. Tschudi at the Technical University of Darmstadt, Germany, for three years.

I chose to study photonics for my PhD because my background is related to optics and it's an area that I find very interesting. The ORC was an obvious choice for me. I had heard a lot about the department from my husband who is now in his final year of his PhD here at the ORC. I joined Professor Rob Eason in the fascinating field of material processing using ultrafast lasers.

I love the open door policy at ORC; the fellow students, professors and other staff members are really friendly and supportive. You can go to them anytime and they are ready to help, listen to you and give you ideas. I am treated as a colleague rather than a student by my supervisor and am encouraged to do and think for myself rather than getting spoon fed.

I am currently the vice-president of the OSA Student Chapter and was the first year representative last year. We as a committee organise a number of social and academic events throughout the year. These include the arctic BBQ, the international food day, IONS, to name a few. It's great fun because everyone comes together like a giant family!

"The best thing about being a student at the ORC is that when I graduate I will have a world recognised, highly acclaimed qualification that will open many doors into the world market for me!"

The best thing about being a student at the ORC is that when I graduate I will have a world recognised, highly acclaimed qualification that will open many doors into the world market for me! The worst thing is the amount of time I get to spend in the lab; I just wish that I could spend more time in there!"

OSA Arctic BBQ 2008

The annual OSA Arctic BBQ held in December was a huge success and enjoyed by all who attended despite the cold temperature and rain!

This year's BBQ held at the Junction Inn, St. Denys was attended by the majority of the student body along with a few members of ORC staff.

ORC student wins award at AOE conference

Third year PhD student, Junhua Ji, recently won the Student Presentation Competition at the Asia Optical Fiber Communication and Optoelectronic Exposition and Conference (AOE) in Shanghai, China, along with three other successful entrants from the USA, Hong Kong and China.

The competition was run by the Optical Society of America (OSA) and IEEE Lasers and Electro-Optics Society (LEOS). The winners were selected by the AOE technical Programme Committee, and were awarded based on the technical advances, the value to the technical community of interest and the skill of public presentation.

Junhua won the award for his presentation entitled "High Peak Power Conversion and High Gain in Pulsed Cladding-Pumped Fiber Raman Amplifier" and received $500 and a certificate.

ORC - hosted Photonics Day

Hot topics for photonics experts – from enhancing LEDs for backlights in TVs, to the assembly of fluorescent molecules into new nanostructures using DNA – were in focus at this years Photonics Day.

Originally suggested by Professor David Hanna, Photonics Day has become an important annual event for the ORC, bringing together researchers from across the University to network and share their work in photonics.

The programme for this year, was arranged by the ORC's Dr Bill Brocklesby and Dr Kevin MacDonald and consisted of three themed sessions – Nano, Exotic States and Sources. Presentations were given by the Schools of Chemistry, Electronics and Computer Science, Maths, Physics and Astronomy as well as the ORC.

A networking lunch was combined with a display of research posters, providing the opportunity for students and postdoctoral researchers in different fields of study to interact with one another.

ORC summer student wins best project award

ORC summer student Helen Rogers was recently awarded with the Rank Prize Fund for the best optoelectronics summer project student in the UK, 2008.

An undergraduate student from St Andrews University, Helen joined the ORC for two months in the summer working under the supervision of Dr. James Gates and Professor Peter Smith. Her project investigated various physical phenomena of UV writing to facilitate the fabrication of advanced planar lightwave circuits. The project was a great success and part of Helen's work now forms the basis for an upcoming publication.

The rank prize organisation provides a bursary for several summer students each year. In addition, the Optoelectronics Committee of the Rank Prize Funds also awards a prize of £500 to the best project.

Helen was awarded her prize in St Andrews by Professor Wilson Sibbett, who is a committee member of the optoelectronic rank prize funds. Helen says "The research involved working with

a laser to fabricate and characterise waveguides and Bragg gratings in planar silica samples. The samples were designed to investigate parameters of the fabrication process, and to optimise the system for future manufacture of devices. The project was great as it allowed the opportunity of working with different equipment setups in a lab environment, and also first hand experience of working within a research group."

PhD Graduate wins prize for thesis in Mexico

ORC PhD graduate Dr. Adrian Amezcua has recently been awarded a prize from The Materials Research Institute of the National Autonomous University of Mexico (IIM-UNAM) for his PhD thesis entitled "Deposition of electronic and plasmonic materials inside microstructured optical fibres".

Originated in 1995, the prize acknowledges the work of top PhD graduates in science and materials engineering. Sixteen Mexican and international graduates from Mexican Universities entered their PhD thesis this year, all related to Material Sciences/Engineering. Winners each received a diploma and a monetary incentive from the Federal District.

ORC PhD Programme

Our PhD programmes provide the opportunity to learn whilst working alongside some of the world's leading scientists in their fields. The majority of your time will be spent conducting novel research either individually or in collaboration with other students or research fellows.
We offer PhD projects in the areas of: Fundamental photonics, Nanophotonics and meta-materials, Optical fibres and materials, Planar lightwave integration, High-power, high energy lasers, Ultrafast lasers and applications, Optical networks and systems, and Biophotonic microsystems.

For more information about our PhD programme please email: admissions@orc.soton.ac.uk

www.orc.soton.ac.uk/phdprogram.html