



Mr CJ Hooker
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Astra Gemini takes aim... and fires!

Late in the afternoon on 28 September, the new Astra Gemini laser system fired its first shot to target. Even though the shot was not at full energy, the focus of this laser still instantaneously ionised the centre of the aluminium foil target leaving only a hole to see afterwards (pictured right). This process generated numerous X-rays, recorded by a pin-hole camera, and also protons and heavy ions recorded by a CR39 plastic track detector.



This is a huge step towards full operations and represents more than three years of hard work by the team of scientists, engineers and technicians in the CLF.

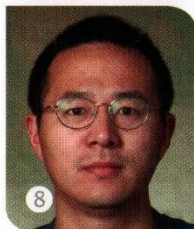
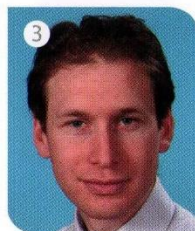
Lead scientist for Gemini laser development, Chris Hooker was delighted with this early success, "A lot of long hours have been worked to reach this point, and that hard work and dedication is greatly appreciated. We still have a lot to do in the coming weeks to fully commission the system, but achieving the first shot is a major milestone."

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→ *Chris Hooker checks the alignment of Astra Gemini*



Movers and shakers



1 **Pavel Matousek** (CLF) has enjoyed a highly successful summer! In August he was elected as the International Delegate of the governing board of the Society for Applied Spectroscopy. The governing board of this prestigious association has only one non-US member. Also in August, he and Charlotte Eliasson (ex-CLF) were presented with a plaque for excellence in communication in their article on SORS in May's issue of Laser Focus World. And in October, Pavel was appointed Visiting Professor to University College London in recognition of his leading work in Raman spectroscopy. Congratulations!

2 **Toby Perring** (ISIS) has been appointed an Honorary Professor in the Department of Physics and Astronomy at UCL.

Congratulations to 3 **Dan Wolff** (CLF) and 4 **Mo Chowdhury** (ISIS) on gaining Chartered Engineer status with the Institute of Mechanical Engineers.

5 **Catherine Jones** (e-Science) has had her first book published. Entitled 'Institutional Repositories: Content and Culture in an Open Access Environment' the book focuses on one of the key challenges faced by the modern academic library.

6 **Raoul Trines** (CLF) received the award for the best presentation at the ICTP Summer College on Plasma Physics in Trieste, Italy.

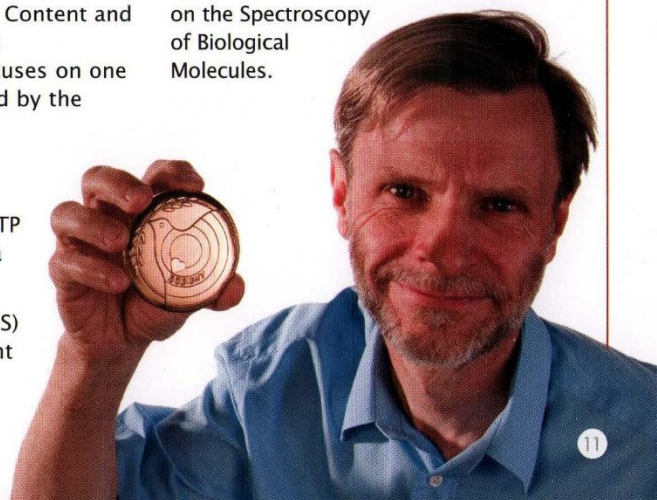
7 **Anna Paradowska** (ISIS) presented the best student paper at the 15th Annual Pressure Vessels and Piping Division

conference of the American Society of Mechanical Engineers in San Antonio, USA.

8 **Xiaobo Yang** (e-Science) won first prize in the 2007 Portlet Challenge Contest sponsored by Sun Microsystems. The international competition is designed to attract developer contributions to the Portlet-Repository, an open-source Java.net project.

9 **Sue Smith** (ASTeC) has taken over from 10 **Elaine Seddon** (SRD) as project manager of the ERL prototype. This will enable Elaine to focus more closely on her strategic role directing efforts towards 4GLS. The rapid and continuing progress of the ERL prototype bears testimony to the ongoing cooperation between SR Department and ASTeC staff in supporting all aspects of this project.

11 **Stewart Parker** (ISIS) was presented with a gold medal for speaking at the first ever conference to be held in Bobigny near Paris. He was one of the speakers at the European Conference on the Spectroscopy of Biological Molecules.



Returning a favour

After receiving help from colleagues at Jefferson Lab (JLAB) with the loan of a wiggler magnet for the 4GLS project, DL staff were delighted to get the opportunity to return the favour. After a recent visit, JLAB asked Daresbury engineers to build a high voltage conditioning resistor for their new high voltage surface testing facility.

Mike Cordwell, one of DL's senior mechanical designers has worked closely with JLAB on a daily basis over mechanical design issues for the ERL prototype. "JLAB has been unstinting in its efforts to help us with the ERL prototype, so we were naturally delighted when we were approached for help", he said.

The resistor in question is a copy of the one developed for the ERL prototype photo-injector. It limits current during high voltage conditioning in the event of an unwanted internal discharge. This is exactly the same function required by JLAB on their test rig, where surfaces and preparation



→ L to R: Rob Smith, Steve Bibby-Trevor and Mike Cordwell with the conditioning resistor supplied to JLAB

techniques for high voltage electrodes can be tested.

The resistor itself is based on a scheme developed by Rob Smith (ASTeC). Steve Bibby-Trevor (TBU), who assembled the resistor, is expert in constructing and handling such specialised components for high voltage assemblies. As he explains, "It is important to take great care with components used in high voltage systems. The finish of all assemblies must be of the highest standard. This resistor will be used at DC voltages up

to 450 kV. Any scratch or misalignment can cause unwanted discharges which can prolong the conditioning process."

The new resistor has now arrived at JLAB and will shortly be installed for use. The experimental results from this test facility will further the development of high voltage equipment and techniques, essential for the next generation of photo-injectors for facilities at JLAB, and for 4GLS.

Important diary date for DL colleagues

On 13 November, Right Management will be hosting a drop-in day in the DL Science Centre for staff affected by the SR closure. There will be the opportunity to meet some of the consultants and review the courses that will be running over the next twelve months. The courses range from CV development to starting your own business. Come along and see what's on offer.

Plasma simulation powers-up

When the users of the Central Laser Facility focus the Vulcan or Astra laser onto a target they create some of the most extreme plasmas that can be made in the laboratory.

To understand why plasmas emit beams of energetic particles or reach a certain temperature, researchers often use numerical simulations. These computer models are also used to plan new experiments. To represent reality the simulations have to be much larger than a single computer can handle, and so a large

parallel computing resource consisting of many networked machines (a cluster) is required.

Recently the CLF has invested in a new cluster for the Plasma Physics Group (the simulation arm of the CLF). The e-Science facility is hosting and maintaining the cluster, and has integrated the cluster into the SCARF resource. The team decided to call the new cluster SCARF-LEXICON, where LEXICON stands for Laser theory and EXperimental Interpretation Compute Nodes.

With the Plasma Physics Group having its own cluster of this size, the group is now in a position to provide much more advanced simulation support to CLF users. Since the new cluster has come online the Plasma Physics Group has been able to submit a number of papers which demonstrate SCARF-LEXICON's capabilities.

One such paper by Alex Robinson and Mark Sherlock has recently been accepted by Physics of Plasmas.

→ Peter Norreys (CLF, front left) with Neil Geddes (Director, e-Science, front right) with colleagues from CLF Plasma Physics Group and e-Science. Left to right: Alex Robinson, Andrew Kaye, Kate Lancaster, James Green, Raoul Trines and Duncan Tooke.



Welcome back neutrons, welcome back muons!

After nine months of intensive maintenance work, ISIS is operational again. The neutron and muon source started its first user run for 2007 in October. The maintenance shutdown was one of the longest periods without neutrons and muons in recent times.

Major projects were completed to ensure the long-term stability and integrity of the facility including:

- Replacing three quadrupole focussing magnets near the muon intermediate target, improving muon instrument performance
- Installing a new hydrogen moderator in the neutron target area
- Upgrading the personnel interlock systems across the accelerators to conform to current safety requirements
- Joining the proton beamline from the ISIS Second Target Station Project into the synchrotron.



→ The new beam extraction area in the ISIS synchrotron will take proton beams to the ISIS Second Target Station Project. The extracted beam flies over the synchrotron and forks left to Target 2 and right to Target 1

A big responsibility



→ Marisa Martin-Fernandez

Marisa Martin-Fernandez (SRS) has been appointed to the Biomolecular Sciences Committee (BMS) of the BBSRC. Marisa's appointment was in recognition of her pioneering contribution to the field of single molecule imaging in living cells. The BMS is one of the seven research committees dealing with the peer review of responsive mode research applications. The BBSRC allocates over £100M per annum to this type of grants.

Marisa has already attended several meetings. "It's hard work!" she explains, "You have to read many grant applications, assess all the reviewers' comments and carefully score the work. It's a big responsibility, but it's also very exciting as you get to read truly exciting scientific proposals. The atmosphere in the committee meetings is very friendly, and the BBSRC office staff know how to make sure you have a very enjoyable and productive time."

Whooo, we're going to Barbados

The annual campus rounders league is an important part of the summer calendar at RAL. But a predominantly FBU team has set its sights even higher.

The Oddballs team took part in the CSSC South & South East Barbados Challenge Mixed Rounders competition in July. They competed against other Civil Service teams for the chance of representing the South East Region in the biennial sports tournament against colleagues in the Barbados Civil Service.



→ Back row: Steve Hawkes (CLF), Rob Clarke (CLF), Tony Kershaw (ISIS), Ronnie Brumfitt (EID), Chris Robey (SSTD). Front row: Kate Ronayne (CLF), Nicki Wallace (FBR), Katie Hopgood (FBR) and Gemma Round (CLIK)

Team Captain, Katie Hopgood (FBR) takes up the story, "Everyone played brilliantly considering the rules were very different from the ones we follow here. A fair number of us came away with lasting memories of the day in the shape of various colourful bruises, but we were thrilled to win!"

The final takes place in Barbados in October 2008 and we'll let you know how the Oddballs get on.

Peta scoops first prize



Peta Foster's (CLF) scrumptious home made chocolates were the most popular display at this year's RAL Arts and Crafts Exhibition. Peta's chocolates received the most visitor votes [something to do with the free samples on offer, perhaps? Ed.] and she was awarded the Myra Gilbert Trophy.

Astra Gemini takes aim... and fires! continued

When it starts operating fully, Astra Gemini will be a unique, new facility, offering the world's only high repetition rate dual beam petawatt laser. This new system will generate a thousand times higher intensity than previously achievable on Astra.

It will only take a matter of minutes for the same number of shots on Astra Gemini that would take a whole day on alternative petawatt facilities, opening up a whole realm of new and exciting scientific possibilities.

→ Back row L to R: Klaus Ertel, Brian Landowski, Bryn Parry, Steve Blake, Oleg Chekhlov, Darren Neville, Dave Neely. Front row L to R: Rajeev Pattathil, Chris John, Rich Bickerton, Brian Wyborn, Peta Foster, Steve Hawkes, Brian Lester, Mags Notley and Chris Hooker



IF YOU HAVE A STORY FOR FACTS PLEASE CONTACT JANE BINKS (DL) EXT. 3235 OR STEPH HILLS (RAL) EXT. 5398.