

I-Sci NEWSLETTER

THE NEWSLETTER OF THE CENTRE FOR INTERDISCIPLINARY SCIENCE



The Centre for Interdisciplinary Science

The Centre for Interdisciplinary Science brings together academic staff from the College of Science and Engineering (Chemistry, Computer science, Geology, Geography and Physics & Astronomy) and the College of Biological Sciences and Medicine, to deliver high quality, research led, interdisciplinary degree programmes.

Spotlight on Interdisciplinary Research



Emma Tebbs, Interdisciplinary PhD Student
University of Leicester

I am PhD student carrying out interdisciplinary research in association with the Interdisciplinary Science Centre.

I have always had a strong interest in ecology, sustainability and the environment. For this reason I was keen to find a PhD project that would allow me to combine both physical and biological sciences.

I chose to focus on the use of satellite remote sensing to study actions on the environment (the influence of human activities). My study centres on lakes in the

East African Rift Valley, in Kenya and Tanzania, I use satellite data to investigate the hydrology and ecology of these ecosystems.

I am supervised by David Harper from the Department of Biology, who has many years of experience studying lakes in the East African Rift Valley, and John Remedios from the Department of Physics and Astronomy, who is an expert in Earth Observation Science. To fund my PhD I work as a Graduate Teaching Assistant for the Interdisciplinary Science Centre which allows me to combine interdisciplinary teaching with interdisciplinary research.

I think interdisciplinary research is the way forward in both expanding current scientific knowledge and also helping to tackle key problems of sustainability and conservation.



Student Video Diary: Man & Machines Module

Watch a student video diary of an I-Science module, search for our facebook page 'Interdisciplinary Science – University of Leicester'.

University Open Day October 2010

If you want to find out more about studying an Interdisciplinary Science Degree with us, why not visit the Centre on one of our University Open Days. The next scheduled open day is:

- Saturday 9 October 2010

For further details of our degree programmes please visit our website:

www.le.ac.uk/iscience

Outreach Opportunities for Schools and Colleges

Outreach activities provided by the Centre include:

- Lectures
- Masterclasses
- Visits/Stands
- Careers and Course Information

Please visit the web site for full details:

www.le.ac.uk/iscience

HEFCE funding for I-Science Development

The centre has received an additional three years of funding through the HEFCE STEM initiative, in collaboration with the Institute of Physics for further development of the I-Science programme. This is in further recognition for the Centre's innovative approach to a natural sciences traditional programme, that integrates the teaching of the science disciplines and is delivered through guided undergraduate research. I-Science not only provides a route to a degree in Natural Sciences but also a broader base for specialisation in a single discipline after year 2. This is continuing evidence of HEFCE support for the development of high quality science education for a wider cohort of students.



I-Sphere International News

I-Science is now an international movement with the starting up of a full degree programme in Interdisciplinary Science at McMaster University in Ontario, Canada. Other universities developing their I-Science programmes have joined I-Sphere, a news-group for the exchange of ideas and new materials.

A student exchange arrangement between McMaster and the University of Leicester will be in place for 2010 entrants.

The photograph shows the first meeting of I-Sphere.



Interdisciplinary Science Prize

Congratulations go to Tim Woodcock, this years I-Science graduating student prize winner. Tim not only achieved a first class degree but carried out an excellent final year project simulating a complex systems approach to the spread of crime.



Delegates at the 2010 LeAP workshop in July

LeAP Summer Workshops Return to Leicester

The LeAP summer workshops returned to Leicester this year after the 2009 event in Dundalk. The workshop, on the development of Problem Based Learning, is run annually by the staff at the Centre. Details of the event, scheduled for July 2011 will be publicised shortly.

External Evaluation of I-Science Report

The Centre has received its latest external evaluation report commissioned from the Centre for Recording Achievement. These evaluations help us to develop the programme with valuable feedback from academic staff, facilitators and students.

The report speaks of students describing the teaching as 'giving a stronger sense of achievement', of 'learning in a more engaging way', and as highlighting a 'strong sense of the relationships of science to real life'. It goes on to make recommendations for developments to the laboratory programme and facilitation arrangements that have now been implemented and will take effect in the current academic session.

International Conference on Physics Education comes to Leicester

The Leicester Centre for Interdisciplinary Science and the Centre for Excellence in Physics Innovation played host to the International conference on Physics Education (GIREP-EPEC) sponsored by the European Physical Society. This was also combined with the UK national Physics Higher Educational Conference. A total of 130 delegates attended meetings over a week in August to exchange experiences of a wide range of teaching initiatives in physics at all levels.

New Headstart Interdisciplinary Science Summer School 3rd - 7th July 2011

Want to find out what it is like to study Interdisciplinary Science at the University of Leicester? – Now you can, by applying through the Headstart scheme to attend our residential summer school scheduled for the 3rd -11th July 2011.

Please see the Headstart web site for cost and further details:

www.headstartcourses.org.uk

Sustainable Livelihoods in Africa

Field Trip to Lake Bogoria, Kenya, 2010

Students from The Centre, studying Interdisciplinary Science at the University of Leicester have recently returned from a field course in Kenya's Rift Valley.

The students had the opportunity to work with the local community as part of a course module on "Sustainable Futures" to help them try to find solutions to everyday problems whilst working towards the goal of sustainable development.

The field trip was led by Dr David Harper (Dept of Biology) and Emma Tebbs (Graduate Teaching Assistant, Centre for Interdisciplinary Science).

Emma said: "I participated in the Sustainable Livelihoods field course as an undergraduate student two years ago and it had a strong influence on me. To come back to accompany a new set of students has been a great experience and it is really good to see the continued success of the project."

After preparatory reading and research in the UK, students travelled to a safari camp at the entrance to the Lake Bogoria National Reserve, near Marigat to work on a variety of projects including:

- Rainwater harvesting
- Honey production and marketing
- Biochar production
- Education using a sustainability game
- Investigating the invasive, non-native plant species *Prosopis juliflora*

2nd Year student Will Metcalfe worked on the Rainwater harvesting project. He said:

"The local people were really knowledgeable about harvesting rainwater.

We managed to ascertain that the main problem in applying rainwater harvesting in the local community is the cost of purchasing a storage tank. We gave an example of how to build a cheap water tank using twigs, concrete and sand, so the only cost was a bag of concrete.

For the community the primary water source was the river but the local people were aware that this was quite dirty.

Collecting spring water involved a one hour round trip every day by the women and children of the village. A few people did harvest rainwater; they had either bought the storage tanks themselves or applied for funding through 'the WWF'. Will commented: "The project has made me realise how clean water is not easy to come by for some people. The trip was a great experience, a real eye opener that gives a proper taste of life in Kenya. The people were so friendly and welcoming"

Raj Gohlan, 3rd Year Interdisciplinary Science undergraduate worked on a Biochar project. Raj explained:

"Charcoal is particularly useful as a soil enhancer to increase crop yields based on the high carbon content fertile soil found in the Amazon Basin called terra preta. The technique is also a good method for carbon capture. Prior to the visit we researched a new technique for producing charcoal more efficiently.

The new method involves using two barrels, one large, one small. The smaller barrel is filled with logs and then turned upside down inside the larger one. The larger one is then filled with small twigs and logs and these are set on fire. A lid with a stack is then placed on top. The idea is that the large logs in the small barrel 'cook' in anaerobic conditions which then produces the charcoal more efficiently. We demonstrated the new technique to the local people and, whilst at the education centre at Lake Bogoria, we constructed an experiment to study how effective the resultant Biochar was at increasing crop yields. Another benefit of this method of charcoal production is that it is less labour intensive, the technique currently used by local people involves digging pits and preparing the charcoal over 4-5 days as opposed to the 4 hours it takes using the barrel method.

The best part of the trip for me was meeting the local people, they were really amazing and were really interested to teach me about their way of life and to learn new ideas."



Related Research: The Darwin Initiative Project

The first three field courses to Lake Bogoria have been held at the same time as Dr Harper's research programme funded by the Darwin Initiative project, "Community-based Biodiversity Conservation Films", training young East Africans in biodiversity conservation film-making. The films produced have been used in teaching within the Sustainability modules taught as part of the Interdisciplinary Science degree courses.

Related Resources for Schools

The Sustainability Game is based on the environment around Lake Bogoria, Kenya. The game looks at how to use the resources in our environment, in this case water, trees, swamps and pastures crops, fish ponds, honey, wildlife and livestock, it demonstrates how closely they are interlinked and the effects of using each resource on the others.

The game resources are available to download from the Centre for Interdisciplinary Science web site.

<http://www2.le.ac.uk/departments/interdisciplinary-science/outreach/sustainable-futures-resource>

Interdisciplinary Science Outreach – Masterclasses 2010

Code Breaking: The Appliance of Science

Year 12 Students from four local schools and colleges visited the Centre to participate in a masterclass on code breaking with a World War II theme. This full day event allowed students to investigate and use a variety of different historical ciphers starting from the simple shift (or Caesar) cipher and eventually working up to ciphers used by Allied and Axis forces during WWII. The students worked in small groups to both encode and crack a series of messages. They enjoyed working in small teams and valued the opportunity to work with students from different schools and colleges. One student commented:

“I liked the fact that we had to use logic to work out the codes. It will help me be more logical at college. It was interesting and something new”.



Lights, Camera, ScienceAction!

Students from Leicester College, after several planning sessions, recently visited the Centre to take part in a film-making masterclass and competition. Their task was to produce a short, interesting 2 minute film about an aspect of science. The students planned their storyboards over several weeks and then spent the day filming and editing at the University.

The winning team produced an excellent stop animation film titled ‘The Evolution of Biscuits, 7 Ways to Kill a Biscuit’ demonstrating, in an amusing and visual way, the pressures of natural selection through the medium of biscuits. One student said about the day:

“I enjoyed learning to use the computer software and the filming”

Electrifying Science Activity Day Solves Murder Mystery

A group of year 10 students from five schools in Birmingham made the trip to the University of Leicester for a fun day of science activities. The day started in the Centre for Interdisciplinary Science with a physics workshop where students carried out a variety of experiments with electrostatics. During this workshop the students had an opportunity to experiment with the Van de Graaff Generator, plasma ball, and balloons, in the process, learning about the effects of static electricity.

Later, students moved to the Department of Chemistry for a Murder Mystery session, using a variety of analytical techniques to solve a chemical ‘Who done it’.

The students had a great day at the university, enjoying the chance to visit several departments to participate in the practical science activities. This gave them the opportunity to apply their scientific knowledge in a new and different setting.



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