

Physics & Astronomy

FROM THE HOD (ASSOCIATE PROFESSOR ROGER REEVES)

It has been a somewhat frustrating week for your HoD this week with lots of time being spent on difficulties with some students. Hopefully they will abate over the next week or so.

The next few months are certainly going to be challenging in the dept as we take on reviews associated with the College Plan, with the BSc review, and the rounds needed for staff salary reviews and promotion. In our case we offer 3 BSc programmes - physics, astronomy and electronics and thus there is a little more work than might be expected. We will do the best we can and hope that it is good enough. A really important part of the BSc reviews is the evaluation from our graduates. An online feedback form is being developed for graduates to use. If you have any leads whatsoever on BSc graduates then please pass the names to myself or Rhondda/Rosalie. My offer of a bounty stands for thesis students who can provide names and contact details of classmates etc who have graduated and moved on.

Some good news for me this week has been the return of the large argon laser after repairs in the USA. We have been out of action with that system for quite some time which seriously restricted some experiments. A helium-cadmium laser purchased last year has saved us and kept the results coming out. Now when you walk along the 6th floor corridor you might see the bright red light indicating LASER ON!

THIS WEEK'S SEMINAR: - 11:00AM, FRIDAY 10 AUGUST

Prof. Keiichi Akama

Department of Physics, Saitama Medical College, Saitama, Japan

A field theoretical foundations of the brane induced gravity

"Braneworld" is a picture based on an idea that we live in a 3+1 dimensional hyper-surface embedded in higher dimensional spacetime. "Brane induced gravity" is a model of braneworld gravity which is induced by quantum fluctuations of the matters trapped on the braneworld. Here we investigate a simple field theoretical model based on the Nambu-Goto action for the brane, and show how it realizes the brane induced gravity.

It turns out that the negative tension of the original Nambu-Goto brane can consistently give the right signatures for the kinetic terms of the matter, for the attractive gravity, and for fine tuning of the cosmological term.

NEXT WEEK'S SEMINAR - 11:00AM, FRIDAY 17 AUGUST

Dr Clemency Montelle

Dept of Mathematics, University of Canterbury

Crossing the Shadow, Theoretical Techniques for Eclipse Prediction in the Ancient World

In all cultures in the ancient world that took an interest in the heavens, eclipses were events of great significance. However, out of all celestial phenomena, they presented the astronomer with the most

challenges. Problems that were easy to formulate such as frequency, duration, and amount of obscuration, rested upon more advanced astronomical and mathematical theories than were available: such as spherical trigonometry, parallax, and the measurement of time, to name a few.

This talk will discuss a selection of observation reports and predictions of eclipse times by early astronomers and explore some early attempts to develop and improve theoretical techniques to model eclipse phenomena, particularly those that emerged in the Ancient Near East and India.

SEMINAR BY MICHAEL CHAPPELL ON HIS PHD – 12:00 NOON, TUESDAY 14 AUGUST

Michael Chappell

PhD Student, Physics and Astronomy Department, University of Canterbury

Diffusion tensor imaging (DTI)

Diffusion tensor imaging (DTI) is a specialist MRI modality that provides information about the diffusion of water in the brain. This can be used to identify micro-structural changes or abnormalities in the brain. Functional MRI (fMRI) is another MRI modality that shows which parts of the brain are activated while the subject performs a given task, for example memory. My research has three progressive stages: using DTI to locate damage in the brains of professional boxers; using DTI as a bio-marker of cognitive decline in Parkinson's disease; and using DTI in conjunction with fMRI to investigate the white fibre connectivity between regions which were co-activated during a memory task. I will present results which have implications for contact sports; for diagnosis and treatment-monitoring of neurodegenerative diseases; and for further research.

WELCOME TO THE DEPARTMENT – KURT HOFFMANN

A belated welcome to Kurt Hoffman who is visiting Roger's group for a month. Kurt and his family spent a year in Christchurch in 2003 for his sabbatical leave. He returns to patch up a few gaps in some results from that time, and to bask in the "early spring" weather. (This last bit is an inside joke between Roger and Kurt's wife Barbara)

PHYSICS & ASTRONOMY DEPARTMENT CONFERENCE (MICHAEL ALBROW)

This year the Department Conference will be held on **Monday 3 and Tuesday 4 September** in Maths 031. This is a great opportunity for students and staff to give presentations on their research and to find out exactly what is going on in the various groups in the Department.

All thesis students will give a 10 minute presentation on their research, with 5 minutes for questions. Students who are away at the time of the conference will give presentations later in the year, possibly in a Friday seminar slot.

Titles and abstracts should be emailed to Rhonda before 21 August. Abstracts should be about 1 paragraph in length.

AUGUST 2007 SCHOLARSHIPS – WEB SITE

View General Scholarships at:-

<http://www.canterbury.ac.nz/scholarships/resources/currentnoticeboard.shtml>

College of Science Scholarship

<http://www.canterbury.ac.nz/scholarships/noticeboard/august2007sci.shtml>

NEWS FROM THE PHYSICAL SCIENCE LIBRARY

(1) SciFi update

Just when you thought you had everything you needed... We now have access to The Oxford Dictionary of Science Fiction. Available via the Library catalogue or access direct... <http://tinyurl.com/26fk4n>. More on our SciFi collection - <http://library.canterbury.ac.nz/psl/scifi.shtml>

- (2) National Library online Science exhibits
<http://tinyurl.com/2443g9>
- (3) Hot Science with Kim Hill
Miss the public seminars? Listen to the podcasts -
http://www.bigpod.co.nz/Default.aspx?tms_id=116&tabid=56
- (4) Hate paint fumes? Avoid Level 3 of the Central Library at the moment..
<http://library.canterbury.ac.nz/news/index.shtml>

Adam - <http://library.canterbury.ac.nz/people/cath.shtml>

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| <p>If you have anything you would like to contribute to the Newsletter, please email Ro on rosalie.reilly@canterbury.ac.nz: Newsletter, Department of Physics and Astronomy, University of Canterbury, Private Bag 4800, Christchurch, Phone: +64 3 364 2404, Fax: +64 3 364 2469.</p> |
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