DEPARTMENT OF PHYSICS & ASTRONOMY
PRIZE WINNERS' CEREMONY
Session 2010/11

Friday, 28th October 2011 6pm-8pm

Wilkins Terrace Restaurant, UCL

Proceedings start at 6.30pm

WELCOME

Professor Jonathan Tennyson FRS
Massey Professor of Physics

Professor Jon Butterworth
Head of Department
Physics & Astronomy

6.40pm-7.15pm
Giving of Prizes to Recipients

7.15pm—8pm
RECEPTION
In the E3/E7 Physics

UNDERGRADUATE PRIZES 2010/11

OLIVER LODGE PRIZE
(Best performance 1st year Physics)
Mr S I Blesneag

HALLEY PRIZE
(Best performance 1st year Astronomy)
Mr S Kruk

C.A.R. TAYLER PRIZE
(Best 2nd Year Essay)
Mr L M Cooper & ***Mr H Ding*** for top mark/best reports

WOOD PRIZE
(Best performance 2nd year Physics)
Mr Z H Wong

HUGGINS PRIZE
(Best performance 2nd year Astronomy)
Mr M Rocchetto

DAVID PONTER PRIZE
(Most improved performance in Department, 2nd year)
Mr W Wang

CORRIGAN PRIZE
(Best performance in experimental work, 2nd year)
Mr M Zacharias

BEST PERFORMANCE 3RD YEAR PHYSICS
Mr A J T Mathijssen

BEST PERFORMANCE 3RD YEAR ASTRONOMY
Miss S Parsa

ADDITIONAL SESSIONAL PRIZE FOR MERIT
(Most Improved 3rd Year)
Mr P Deludet

BURHOP PRIZE
(Best performance 4th year Physics)
Mr J Hansom

HERSCHEL PRIZE
(Best performance 4th year Astronomy)
Mr C J Salji

BRIAN DUFF MEMORIAL PRIZE
(Best 4th Year project in the department)
Joint winners: ***Mr A Bridi*** for Phys & ***Mr J L Bush*** for Nat Sci

WILLIAM BRAGG PRIZE
(Best overall undergraduate)
Mr W C Zhou

TESSELLA PRIZE FOR SOFTWARE
(Best use of software in a final year Physics/Astronomy project)
Mr D Osmanovic

POSTGRADUATE PRIZES 2010/11

CAREY FOSTER PRIZE
for Outstanding Postgraduate Research Physics AMOPP
Dr Tahir Shaaran

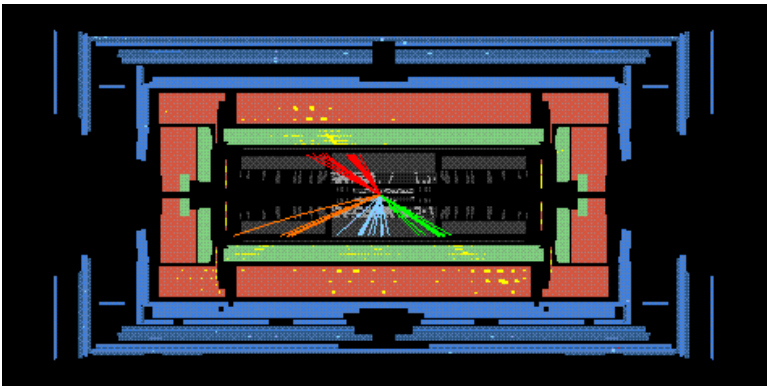
HEP PRIZE
for Outstanding Postgraduate Research Physics HEPP
Dr Matthew Mottram

MARSHALL STONEHAM PRIZE
for Outstanding Postgraduate Research Physics CMMP
Joint winners: ***Dr Dara McCutcheon*** & ***Dr Marc Warner***

HARRIE MASSEY PRIZE
for Best Overall MSc student
Ms Linda Cremonesi

JON DARIUS MEMORIAL PRIZE
for Outstanding Postgraduate Research Astrophysics
Dr David Kipping

DEPARTMENTAL TEACHING PRIZE
Dr Phil Jones



Dr. Eric Jansen / ATLAS Collaboration

CITATIONS

Matthew Mottram: for making outstanding contributions to the ANITA-II experiment, which searched for radio emission from ultra-high energy neutrinos and cosmic-rays interacting in Antarctica. The ANITA-II instrument flew on a NASA long-duration balloon mission at an altitude of approximately 35km and spent over 30 days circulating over Antarctica. Before the flight Matthew was essential to the integration and testing of the instrument which took place in Palestine, Texas and Williams Field, Antarctica. In particular, Matthew was responsible for leading the effort to characterise and optimise the sensitivity of the trigger, which is the key component defining the science sensitivity of the ANITA-II experiment.

After the ANITA payload landed, Matthew led the team responsible for recovering the instrument from a site in the middle of the Ross ice shelf. Since returning to the Northern hemisphere, Matthew has been heavily involved with the effort to calibrate and analyse the ANITA-II data. The results of this analysis are the setting of the world's best limit on the flux of ultra-high energy neutrinos and a measurement of ultra-high energy cosmic ray air shower events. Matthew's work during his PhD has influenced the design of the ANITA-III instrument which should detect 100's of cosmic ray air shower events and maybe the first positive indication of ultra-high energy neutrinos.

Dara McCutcheon: for his theoretical work on the de-coherence of quantum systems in solid-state environments, especially for his studies of multiple systems coupled to a common environment and for his role in the development and benchmarking of powerful variational techniques.

Marc Warner: for his experimental work using spin resonance as a probe of condensed molecular systems, especially for his studies of molecular orientations in thin films and for his demonstrations of very long spin coherence times.

Tahir Shaaran: studied different scattering mechanisms in laser-induced nonsequential double ionization for NSDI of atoms and diatomic molecules. Such studies were performed using mainly analytic methods, within the Strong-Field Approximation for SFA. He provided a rigorous treatment for excitation in this phenomenon, and the approach developed was applied to ultrafast imaging of matter. This work was important for the following reasons:

a) These are the first and most comprehensive analytical studies of excitation and electron-electron correlation in NSDI.

b) Technically, this was a challenging problem, which required extensive analytical computations and a large amount of coding, which had to be produced from scratch. The work carried out by Tahir resulted in a high-quality PhD, with four articles published in high-impact international journals.

c) It also posed a challenge to Tahir. In order to develop this work, it was necessary for him to acquire a broad knowledge, ranging from strong-field physics, S-Matrix approaches, saddle-point methods, to programming languages. It should be noted that, prior to his doctoral studies, Tahir did an experimental MSci, which required a completely different set of skills and expertise. Since day one, he has worked in a very focused and diligent way, and has revealed himself as a very ambitious and persistent individual. He has strong mathematical skills and a critical mind, and works very well in a team.

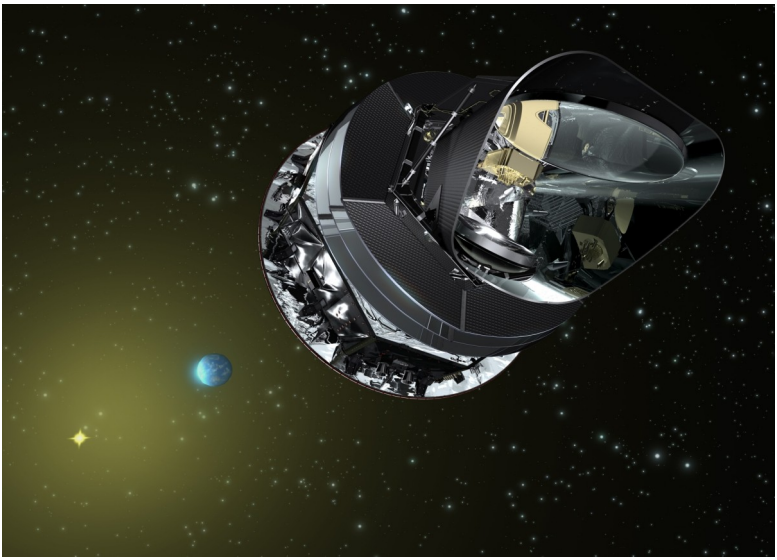
Dr. David Kipping's work is remarkable in that it virtually single-handedly started a new field of study - the search for exomoons, that is the moons of planets going around other stars. His work, published in nine single-author plus six first-author peer reviewed publications, now forms a significant part of the search for exo-objects with space facilities such as the NASA Kepler probe.

When David first looked at the mathematics of transit observations the field was using simple assumptions such as circular orbits: his novel contribution has illustrated that far more information is available about exoplanet orbits, and in particular potentially about exomoons, than was conceived of three or four years ago. David's work is significant because it has been at the vanguard of the development of the statistical theory of transit observations.

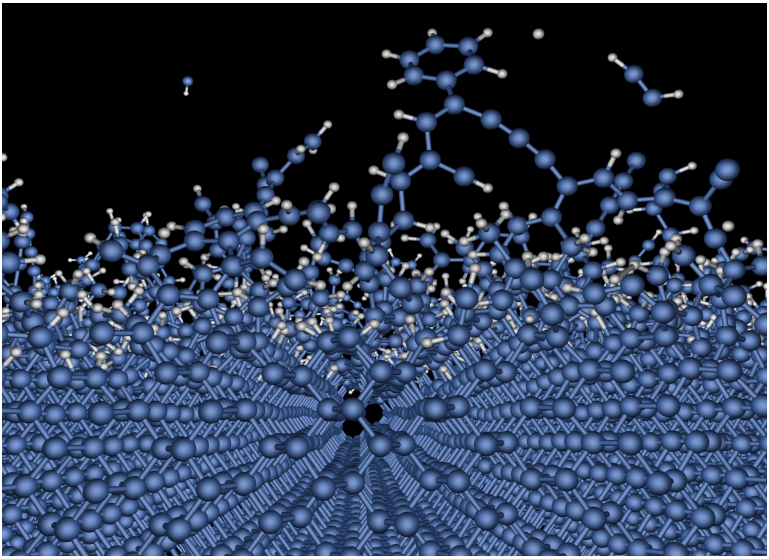
His promotion of the idea that exomoons may be one of the most important areas to look for habitable worlds has brought him to the attention to a wider international community.

From his thesis work at UCL, David has gone on to an important position at CfA in Harvard which gives him access to Kepler data and the chance to put his ideas into action.

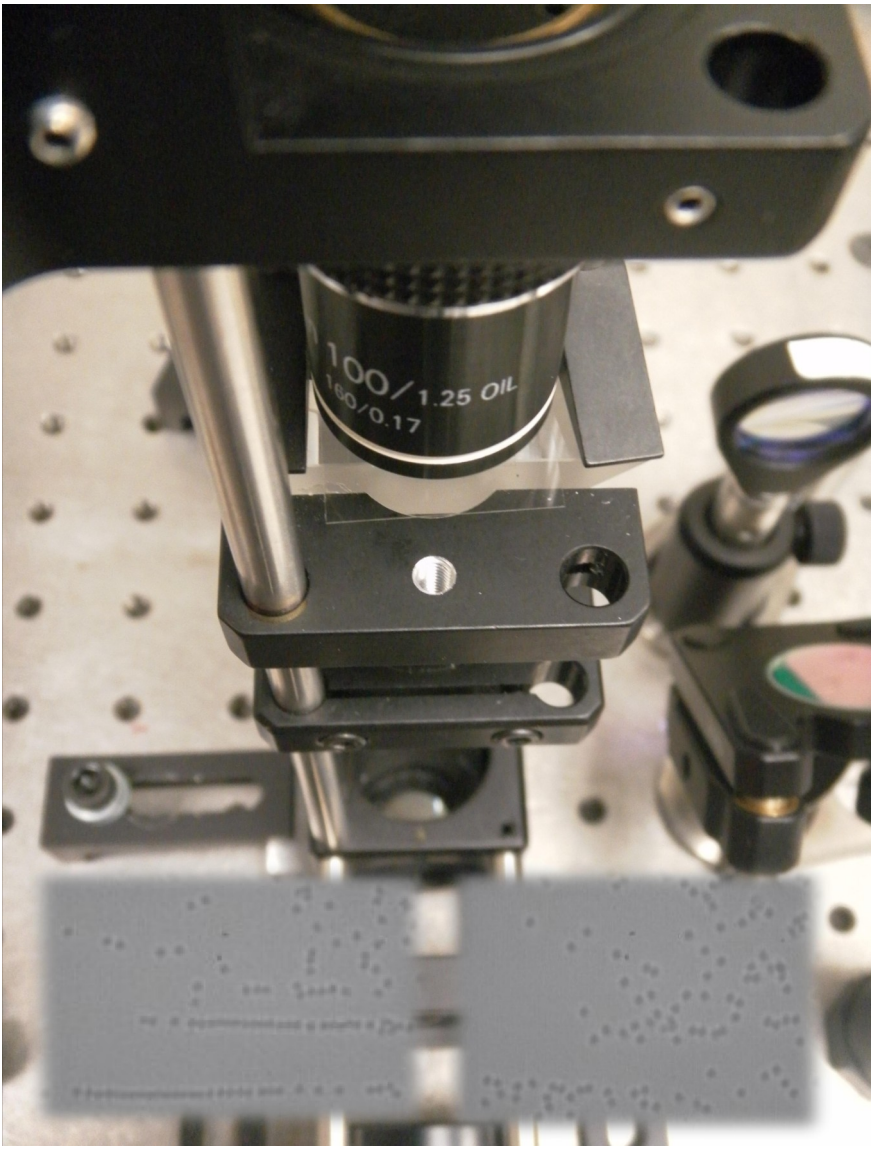
Ms Linda Cremonesi achieved a distinction in her MSc with an overall mark of 83%. This mark included an exam average of 87% with three exams having marks of over 90%. Her project was very highly rated with a mark of 79%. In particular her markers commented "Linda's investigations into possible improvements to the muon tomography reconstruction algorithms, by incorporating an event-by-event determination of the energy of the muon, represent a significant advance for the CREAM TEA project. This work will form the basis of the next phase of hardware development of the project, through the addition of a muon range component detector"
"The report is exemplary with a comprehensive review of the muon tomography subject and a clear and concise delivery of the methodology and results obtained. In fact we would recommend it to anyone who wants to get familiar with the muon tomography field."



Dr Hiranya Peiris & Dr Giorgio Savini
ESA/Planck Collaboration



A model of a diamond surface interacting with a fusion plasma
By Alastair Dunn and Dorothy Duffy



Self-organization of colloidal microparticles in an evanescent laser field

Dr Phil Jones/UCL Optical Tweezers Group