



YOUNG TALL POPPY



School of Physics optical researcher, Dr Boris Kuhlmei, has been awarded a Tall Poppy from the Australian Institute of Policy and Science, announced at an awards ceremony on 3 November 2011. The Tall Poppy is a prestigious annual science award that recognises young scientists who are doing outstanding work in their field and actively engage and educate the community about their work. Boris, seen left being presented with his award from Professor Stephen Thurgate, researches and develops optical fibres used in microscopes and for

medical tools. His work focuses on how the fibres' microscopic structure affects light travelling through it. Boris has been developing fibres perforated with microscopic holes.

Dr Kuhlmei has also been working on inserting metallic nanostrands into fibre to adjust its optical properties. Receiving his award at the Powerhouse Museum, Boris said he was honoured to receive the award. "It is a great encouragement to receive such acknowledgment. Photonics and optics is a fast developing field and I'm looking forward to not only working in this area but also educating students about it as it continues to develop."

Dr George Hobbs from CSIRO Astronomy and Space Science received the UNSW Medal and prize for the Young Tall Poppy Scientist of the Year. Dr Hobbs is an adjunct senior lecturer in the School of Physics. Tall Poppy keynote speaker, Professor Bryan Gaensler, said he was not surprised that Dr Hobbs had been so honoured. "George has made a tremendous contribution over a number of years to the School of Physics by co-supervising honours and PhD students. Both he and Boris are deserving winners."

The School of Physics winners were two of eleven scientists honoured with 2011 Young Tall Poppy Science Awards in NSW and one of four from the University of Sydney. "I'd like to congratulate our Young Tall Poppy Science Award winners this year. It's a wonderful recognition of not only their excellent research, but also their engagement with schools and the wider community," said Professor Trevor Hambley, Dean of the Faculty of Science. "Over the past eleven years of the Young Tall Poppy Science Awards, University of Sydney scientists have been honoured every year, which is a great acknowledgement of the research outputs and engagement with community fostered at our university."

Previous Tall Poppy winners from the School of Physics are ARC Federation Fellows, Professor Bryan Gaensler and Professor Marcela Bilek. Professor Gaensler, Director of the ARC Centre of Excellence for All-sky Astrophysics (CAASTRO), at the University of Sydney, was also a Keynote Speaker at the awards ceremony.

Four University of Sydney scientists have won Young Tall Poppy Science The University of Sydney winners are: Dr Deanna D'Alessandro, from the School of Chemistry; Dr Boris Kuhlmei, from the School of Physics; Dr Peter Liddicoat, from the Australian Centre for Microscopy and Microanalysis; and Dr Michelle Peate, from the School of Psychology.

Congratulations to Boris and to all the Tall Poppy award winners.

DR KARL *THE FACE OF SPACE*

Dr Karl Kruszelnicki AM, the Julius Sumner Miller Fellow, is the face of the YouTube Space Lab competition for the Asia Pacific region.

Google, in cooperation with Lenovo, NASA, the European Space Agency (ESA) and the Japan Aerospace Exploration Agency (JAXA), are challenging 14 to 18 year olds to design an experiment that can be conducted in space. The worldwide winner of the competition will have their experiment performed by astronauts on the International Space Station and live streamed on YouTube around the world.

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"YouTube Space Lab brings the magic of space to students around the world. It's an exciting way for them to learn more about space and the International Space Station, while designing their experiment," said Dr Karl.

"The winner will have the amazing experience of their experiment being conducted on the International Space Station, plus lots of other fabulous space-related prizes, including a visit to NASA," explained Dr Karl. "Entrants just need to think of a science topic or question that they would want to explore, then explain their proposed experiment in any way they like in a two minute film for YouTube."

Dr Karl was chosen by Google to promote the competition due to his high profile as a science communicator and his popularity with children and adults alike. A series of short promotional films were shot with Dr Karl in the Main Quadrangle of the University of Sydney, in which he outlines the concept of the YouTube Space Lab competition, and answers other questions such as 'Did you always excel at Science at school?' and 'What do you believe is our greatest unanswered question?'

In one of the films, Dr Karl explains the classic gravity experiment conducted by astronauts on the Apollo 15 Mission to the Moon in 1971. Astronaut Dave Scott drops a falcon feather and a hammer on the Moon to demonstrate gravity - watch the film to see what happens.

You can enter the YouTube Space Lab competition by designing an experiment that can be conducted in space, making a film about it and uploading to YouTube. The YouTube Space Lab competition closes on Wednesday 7 December 2011 and entry details can be seen at: www.youtube.com/user/spacelab



INNER SPACE



Science and beauty meet in inner space in *The Incredible Inner Space* Exhibition hosted at Questacon – The National Science and Technology Centre – shows that microscopy matters.

The microscope lens is a window revealing beautiful images to the public and valuable data to researchers.

Highlighting the very latest research and everyday wonders, the images come

from the Australian Microscopy & Microanalysis Research Facility. The image above is of wattle pollen. All the images they show a rich diversity of intriguing subjects such as the crystal structures that identify ancient flamingo eggs, next generation vaccine technology and iron-reinforced teeth. You can see the nanostructures that make an alloy strong and the finest detail of native wood used by convict cabinet-makers in historic furniture. See what makes a velvet worm waterproof or what makes a pencil write.

Dr Paul Willis will officially launch the exhibition on 18 November who said, “We all know there is beauty in nature. The closer we look, the more beauty is revealed. Get close enough and the images are truly gobsmacking!”

This exhibition is, however, about more than just the pictures. It highlights real science outcomes enabled through strategic investment in national research infrastructure. Department of Innovation, Industry, Science and Research Deputy Secretary, Patricia Kelly, will represent Innovation Minister Kim Carr at the launch, emphasising the importance of this infrastructure investment.

Incredible Inner Space is on display at Questacon until the end of January 2012. For more details: www.ammrf.org.au/

FAREWELL

The School of Physics bids farewell to Ian Johnston, who after many years as an active member of the School's retired academic staff has decided it's time to step down from lecturing and is giving up his second year Quantum Physics course. Ian will continue helping in the School's computational labs and remains an important contributor to the Physics Education research activities of the SUPER group. The School sincerely thanks Ian's significant contributions in many areas including teaching, education research and of course, as a previous Deputy Head of School.

Farewell to Richard Tarrant an active academic member of the School staff who leaves this month. Richard has also made a significant contribution to the School, particularly in recent years in coordinating activities associated with our 1st year undergraduates. The School wishes both Ian and Richard all the best for the future.

The School also farewells a non-academic member of staff, Alison Muir who leaves 30 November. In her eight years at the School Alison has worked tirelessly to promote the School in the media and through publications and events. She has engaged the School with over 4,500 alumni, friends and donors, and has helped raise over \$10M for the Science Foundation for Physics and the School. We wish Alison well in her future endeavours.

AIP PRIZE WINNER

School of Physics PhD candidate, Ms. Stacey Hirsh, has been awarded the 2011 Ken Doolan Memorial Prize (\$1,000) by the Australian Institute of Physics (AIP). The prize is awarded each year at the AIP Industry Day to the student with the most outstanding scientific poster in the fields of physics and chemistry. Stacey presented her research showing how the novel, linker-free covalent immobilization method developed by Professors Marcela Bilek and David McKenzie can be used to control the immobilization of protein mixtures.



Adsorption from protein mixtures is difficult to control because competitive protein exchange results in undesired layer instabilities both in the structure and composition of the surface adsorbed protein layer. Overcoming this problem, she demonstrated that rapid linker-free covalent binding provided with surface activation from plasma treatment enables the control of the attached protein composition through a combination of parameters, including the manipulation of the protein flux to surface and the covalent binding time.

The proteins are also attached in their native conformation, which preserves their function when immobilized on the surface. She also showed industrial applications of controlled protein mixture immobilization, including bioreactors for ethanol fuel production from cellulose waste resources (cardboard and agricultural waste) and medical devices with improved biocompatibility. This work has been published in high-impact scientific journals, *Langmuir* and *Journal of Materials Chemistry*. The details of the free radical-based covalent attachment mechanism have also recently been published in the prestigious *Proceedings of the National Academy of Sciences (PNAS)*.

IN BRIEF - ARC GRANTS

School of Physics researchers in nanotechnology, metamaterials and astronomy were awarded \$1,624,587 in ARC Discovery Grants announced on 1 November. Congratulations to Dr Dane McCamey and his colleagues, Professor Alex Hamilton, Professor Johan van Tol and Professor Yoshiro Hirayama; Dr Boris Kuhlmeiy and Dr Alex Agyros; Professor Joss Bland-Hawthorn, Professor Ken Freeman and Professor Stefan Keller; also to Professor Tim Bedding, and former School of Physics astronomer, Dr Mike Ireland and Professor Quentin Parker (Macquarie University), who all received Discovery Grants.

As well the School of Physics was successful in the ARC funding outcomes for Future Fellowships and Discovery Early Career Researcher Awards (DECRA) announced by Senator Kim Carr on 14 November. Congratulations to Dr Mark Pelusi and Dr Christopher Chaston who were both awarded ARC Future Fellowships valued jointly at \$1,375,888.

As well six DECRA, valued at \$375,000 each, were awarded to Dr Dennis Stello, Dr Chunle Xiong, Dr Jochen Schröder, Dr Chad Husko, Dr Eric Cavalcanti and Dr Nicolas Menicucci. Their research projects range from photonics and optics through to quantum and astronomy. Well done to all ARC funding recipients!

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