



SPIN

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A newsletter for the
ARC Centre of Excellence for
Particle Physics



CoEPP Melbourne student-
James Webb

COEPP MELBOURNE STUDENT JAMES WEBB RECEIVES SCHOLARSHIP FROM COMPANY 2MRD

CoEPP Melbourne PhD student, James Webb, recently received a top-up scholarship from Australian company 2MRD (www.2mrd.com.au), developers of radiation detection and simulation technologies for healthcare, energy and resources, and Defence.

James, under the supervision of Prof Geoff Taylor, is undertaking a research project on instrumentation for particle detection and simulation for the Belle II experiment in Japan.

“This scholarship will provide me the opportunity to broaden my studies related to radiation sensitive detectors,” said James.

2MRD co-founders Iwan Cornelius and Christopher Poole previously worked as research academics in the field of radiation detection and simulation. The provision of PhD

top-up scholarships has been part of the business plan since 2MRD was founded in 2014.

They are pleased to have the opportunity to contribute to the success of the Belle II experiment, and believe that James will bring his excellent research outcomes to the high energy physics and radiation protection communities.

The co-founders have recently established spin-out companies, Radiation Analytics and Amentum Defence and Security, to commercialise some of the technologies they are developing. In addition, they plan to introduce more future scholarship opportunities through the two new companies.

“Scholarships represent a win-win-win situation: the scholarship eases the student’s financial burden

Congratulations to CoEPP researchers who were successful in the November 2016 ARC Major Grants announcement, sharing in \$3.3M worth of funding in Discovery Projects, Future Fellowships and Linkage, Infrastructure, Equipment and Facilities grants. They are:

Associate Professor Peter Skands - Discovery project: Emergent phenomena in quantum chromodynamics.

Professor German Valencia and Professor Csaba Balazs - Discovery project: Visualisation of multidimensional physics data.

Professor Kevin Varvell - Discovery project: Rare decays of B mesons: Probing new physics with Belle II.

Dr Bruce Yabsley - Discovery project: Antimatter and exotic mesons at the intensity frontier.

Dr Matthew Dolan; Associate Professor Nicole Bell; Professor Raymond Volkas - Discovery project: The origin of (dark) matter.

Professor Elisabetta Barberio; Professor Anthony Williams; Professor Geoffrey Taylor; Dr Phillip Urquijo; Professor Anthony Thomas; Associate Professor Paul Jackson - LIEF grant: Full scale detector system for dark matter.

Associate Professor Shahram Rahatlou - Future Fellowship: Quest for dark matter and new phenomena at the energy frontier.

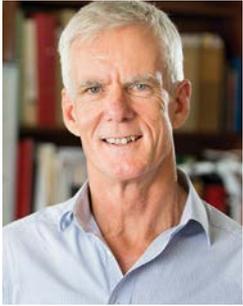
Dr Peter Athron - Future Fellowship: Understanding physics through flexible calculations.

Professor Elisabetta Barberio - Discovery project on Stawell Underground Physics Laboratory: Dark matter detector.

and allows them to focus on their research; the university may be rewarded for engaging with industry and it benefits from the student’s improved performance; and the scholarship has marketing and business development benefits for the company,” said Iwan Cornelius.



FROM THE DIRECTOR



It has been both a productive and challenging few months for CoEPP.

We celebrated the success of Pre-SUSY Workshop and SUSY 2016 Conference in

Melbourne early July. Thanks to a joint team effort between CoEPP Monash and Melbourne, the conference had more than 270 participants, 220 abstracts submissions, 31 plenary talks and an intriguing public lecture by Prof John Ellis on dark matter and supersymmetry. Through the talks we explored the unknowns, and probed some new ideas in theoretical, phenomenological, and experimental aspects in the field of supersymmetric theories.

In September Adelaide node hosted INPC 2016, together with Australian National University and ANSTO. The large-scale conference attracted international delegates from organisations including TRIUMF, JLab, IUPAP and RIKEN. A diverse range of talks reviewed and discussed recent progress and development in nuclear physics research, including the discovery of element 113 at RIKEN.

In addition, Fermilab, the USA's major high energy physics laboratory, and CoEPP have recently signed upon an international Cooperative Research and Development Agreement (CRADA), which is a significant step in forging active partnership in tackling some of the shared challenges in physics research. The agreement will facilitate future collaboration in both directions of researchers, technical staff and students to work on activities including advanced theoretical physics, precision measurement techniques, advanced

research computation methods, underground experimentation and accelerator R&D.

With extreme disappointment, we learned about the unsuccessful outcome for the proposal for CoEPP2. However it is important to remember that this in no way reflects the significance or quality of our work. Since then there has been many constructive ideas proposed to seek avenues for additional funding so that CoEPP can continue beyond the current ARC funding period. At this moment, your ongoing commitment and support will be much appreciated and will empower us to develop these ideas into concrete plans and strategies so as to continuously maintain and expand particle physics research in Australia. I look forward to keeping you informed of new developments.

COEPP PERSONNEL UPDATES

ADELAIDE NODE

Farewells:

-Dr Jinmian Li, who has taken up a Research Fellow position at Korea Institute of Advanced Study in Republic of Korea.

-Dr Soumya Rao, who has taken up a Postdoctoral Fellow position at National Centre for Nuclear Research (NCBJ), Poland.

-Dr Zhan-Wei Liu, who has been employed by Lanzhou University, China as an Assistant Professor.

-Dr Xuan Gong Wang, who left University of Adelaide on 9th September 2016.

-Dr Lawrence Lee will take up a new position at Harvard University in November.

Welcomes:

-Dr Juan Herrero Garcia commenced employment on 26 September 2016.

-Dr Mareck Lewicki commenced employment on 1 November 2016.

-Kay Marie Martinez commenced a PhD candidature under the supervision of Professor Anthony Thomas.

Awards:

-Daniel Murnane won the Faculty of Science final of "3 minute thesis" on 25 August 2016, titled "A most natural Universe".

Phiala Shanahan (former PhD Student):

-Winner of the 2016 Bragg Gold Medal for her PhD Thesis "Strangeness and Charge Symmetry Violation in Nucleon Structure".

-Winner of the 2016 PhD Research Excellence award at the Science Excellence Awards SA held on 12 August 2016.

-Awarded the American Physical Society's 2017 Dissertation Award of the Topical Group on Hadron Physics.

MONASH NODE

Farewells:

-Andrew Lifson, who has gone to Zurich to begin a Joint Master of High Energy Physics at ETH Zurich/l'Ecole Polytechnique Paris.

Welcomes:

-Cody Duncan, who has begun a PhD with Peter Skands.

SYDNEY NODE

Farewells:

-ATLAS students Mark Scarcella and Curtis Black, who completed their PhDs.

Theory students:

-Jason Yue will be working at National Taiwan Normal University as a postdoc.

-Yunho Kim has been admitted into a Masters program at Imperial College, UK.

-Rupert Coy has been admitted into the PhD program at the University of Montpellier, France.

-Alex Spencer-Smith completed his PhD.

Welcomes:

-Lachlan Vaughan-Taylor and Nadia Toutounji, who have commenced MPhils on Belle II.

-Visitor Dr Ning Liu from Henan Normal University to CoEPP for a year on sabbatical.

MELBOURNE NODE

Farewells:

-SUPL administrator- Mr Alessandro Caronti.

-PhD student Peter Cox, who has started a new position at the Kavli Institute for the Physics and Mathematics of the Universe (Kavli IPMU), Japan, working on physics beyond the Standard Model.

Awards:

-Professor Geoffrey Taylor awarded Redmond Barry Distinguished Professor by the University of Melbourne.

-Rebecca Leane won the Young Scientist Research Prize in the category of physical sciences from the Royal Society of Victoria.

-Associate Professor Nicole Bell has been named a Fellow of the American Physical Society (APS).

SUNSHINE HARVESTER PRIMARY SCHOOL VISIT

— BY DAVID WAKEHAM (COEPP MELBOURNE)



CoEPP Melbourne student-David Wakeham

Situated in Melbourne's western suburbs, Sunshine Harvester Primary School encourages its students to aim high. On 21 July, the school celebrated its inaugural Aspirations Day; children wear costumes inspired (often rather loosely!) by their career goals and future aspirations,

and hear from architects to chefs to former Socceroos about different options in the post-compulsory world. I was invited by organiser Stephanie Koutsaplis to talk about being a scientist.

My audience consisted of ~50 colourfully arrayed grade 4 and 6 students, with more than a few decked out in lab coats and safety goggles. I told them about different length scales in physics and the questions physicists ask about them, the crucial relation between theory and experiment, and some exciting large-scale projects the university is involved in, such as the LHC and LIGO. I also described my day-to-day life as a scientist and the joys and frustrations of research.

Although the school boasts a high proportion of EAL students, my listeners were engaged and refreshingly curious, peppering me with questions about studying science and, in particular, theoretical physics. Evidently, black holes and extra dimensions are more fashionable among grade 6s than in my day! It was a great privilege (not to mention lots of fun) to talk science with some curious young minds, many of which—I'm confident—will some day make excellent scientists!

STAWELL UNDERGROUND PHYSICS LABORATORY PHOTOWALK

On 25 August, Dr Phillip Urquijo gave a lecture titled "Searching for dark matter at the Stawell Underground Physics Laboratory" to years 9 and 10 and VCE physics students from Stawell Secondary College, St Arnaud Secondary College, Marian College and Ararat Community College. Together with Prof Elisabetta Barberio, he also conducted a guided tour and launched the Global Particle Physics Photowalk Exhibition – a permanent exhibition showcasing some fascinating images of the underground physics laboratory in its very early stages of development alongside images from the world's physics laboratories.



Above: Dr Phillip Urquijo and students
Left: Dr Phillip Urquijo (far left) and Prof Elisabetta Barberio (far right)



SUSY CONFERENCE 2016 – MELBOURNE VICTORIA

Over 270 participants attended SUSY2016 conference and Pre-SUSY Workshop held at University of Melbourne in July. Co-hosted by CoEPP Melbourne and CoEPP Monash, the conference was a huge success that brought together physicists from all over the world to Melbourne and inspired some great discussions in the field of supersymmetry and beyond.



SUSY Conference attendees



Prof Csaba Balazs (Monash University) speaking at the SUSY welcome reception



Prof John Ellis (King's College London) giving a public lecture titled "The Dark Frontier"



Prof Hitoshi Murayama (Kavli Institute for the Physics and Mathematics of the Universe)



Australian Government
Australian Research Council



THE UNIVERSITY OF
MELBOURNE



MONASH
University



THE UNIVERSITY OF
SYDNEY



THE UNIVERSITY
of **ADELAIDE**

PARTNER INSTITUTIONS

University of Pennsylvania (USA)
Université de Genève (Switzerland)
Duke University (USA)
Universität Freiburg (Germany)
University of Cambridge (UK)
INFN - Istituto Nazionale di Fisica Nucleare (Italy)
University of Minnesota (USA)

CONTACT COEPP

Centre Director
Geoffrey Taylor
director@coepp.org.au

SPIN Editor
Ying Hu
ying.hu@coepp.org.au

COEPP.ORG.AU