

The Australian Institute of Physics (*Queensland Branch*)
John Mainstone Youth Lecture Tour - Itinerary 2018

<i>Main lecture delivered by Dr Sean Powell in 2018</i>			
Event	Date	City	Venue and time
1	Monday 6 August	Bundamba	Bundamba State Secondary College Venue: Auditorium 15a Naomai Street, Bundamba Qld 4304 Time: 10:00 am for 10:30 am – 11:30 am Ms Joanne Leschke, HOD Science jlesc2@eq.edu.au P: 07 3816 6333
2	Tuesday 7 August	Sunshine Coast	Ken Thamm Centre Lecture Theatre Immanuel Lutheran College Wises Road, Buderim 8:45 am for 9:00 am – 10:00 pm Mrs Cheryl Fillmore, Dean of Teaching and Learning fillmorec@immanuel.qld.edu.au P: 07 5477 3467
3	Friday 10 August	Brisbane City, Brisbane	Mary Place Level 1 All Hallows' School 547 Ann Street, Brisbane 3:30 pm for 4:00 pm – 5:00 pm HOD_admin_assist@ahs.qld.edu.au P: 3230 9560
4	Monday 13 August	Toowoomba	Lecture Theatre R113 University of Southern Queensland Toowoomba Campus 1:00 pm for 1:30 pm – 2:30 pm Mrs Debbie White, Senior Faculty Marketing Officer faculty.marketing@usq.edu.au P: +61 7 4631 2361
5	Thursday 16 August	Townsville	Flexible Learning Area St Margaret Mary's College Crowle Street, Hyde Park, Townsville 1:00 pm for 1:30 pm – 2:30 pm Mr Mick Godbold, HOD Science mgodbold@smmc.catholic.edu.au P: 07 4726 4900
6	Friday 17 August	Cairns	The Auditorium Redlynch State College Jungara Road, Redlynch, Cairns 1:15 pm for 1:30 pm – 2:30 pm Ms Allison Sneddon, HOD Science asned2@eq.edu.au P: 07 4039 9222
<i>Guest lecture delivered by Dr Jacqui Romero in 2018</i>			
Event	Date	City	Venue and time
+1	Monday 6 August	Mount Isa*	Multimedia Centre Spinifex College, Mount Isa 2:00 pm for 2:30 pm - 3:30 pm Mr Ben Robson, HOD Maths and Science robs1@eq.edu.au P: 07 4744 7222

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The 2018 AIP Lecture Series will be delivered by Dr Sean Powell.

Sean Powell's research experience is in theoretical and computational modelling of particle dynamics and diffusion and MRI characterisation of diffusion in complex pore spaces. In addition, Sean has industry experience in computer software and hardware engineering, 3D visualisation systems, and solar thermal energy research. Presently, he leads the biofabrication research team within the Biofabrication and Tissue Morphology research group at the Queensland University of Technology. His quantitative and problem solving skills as a physicist complement those of the multi-disciplinary team of biologists, organic chemists, clinicians and medical engineers. He is also passionate about learning and teaching and lectures undergraduate physics at all year levels from introductory to advanced. Dr Power's talk in 2018 is titled *Physics is everywhere!* - a journey from sub-atomic particles to the large-scale structure of the universe, where physics seeks to answer the most fundamental questions about reality. As we learn more, we can do more! Physics is everywhere in our world and underpins all our technologies. This year, Sean will discuss the important problems that all of us encounter every day: how do I teleport myself to school? What do I do when I find myself inside a black hole? Why is my time-machine not working? He will also talk about the superpowers that you can gain as a physicist, such as the ability to make accurate quantitative observations and predictive and interpretive mathematical models. These powers mean that you can become very valuable and work in many industries such as fundamental physics research, economics and finance, space and aeronautics, healthcare and medicine, learning and teaching, electronics and computers, and so much more!

An additional regional lecture will be delivered in Mount Isa in 2018 by Dr Jacqui Romero.

Jacqui is an experimental quantum physicist and is an expert on high-dimensional entanglement of the spatial modes of light. She completed her bachelor's and master's degrees in the University of the Philippines, doing research on shaping light for applications like microscopy and microfabrication. She moved to Scotland in 2008 to pursue a PhD in the University of Glasgow. Her research established optical orbital angular momentum as an accessible property for studying entanglement. She moved to Australia in 2015 to work on an interdisciplinary project between physics and philosophy. She was awarded a Discovery Early Career Research fellowship by the ARC in 2016. She was one of four L'Oreal-UNESCO For Women in Science Fellows in Australia in 2017. She is interested in revealing strange phenomena afforded by high-dimensional entanglement in light and developing quantum communication and computation technology.

Dr Romero's talk in 2018 will focus on *Slower light in free space*. The speed of light is nominally given by c/n , where n is the refractive index of the medium in which the light is travelling. The refractive index of free space is 1, hence it is natural to expect that in free space, light travels at c . We show that this is not the case when you consider real beams.

We consider photons in a Bessel mode and a focused Gaussian mode, and show that in both cases, the reduction in group velocity results to a delay of several micrometers over a propagation distance of 1 m or ~ 30 femtoseconds in terms of arrival time.

Please note that the lecture is intended to be a one-hour event. Interaction between students and the lecturer is expected (in the form of question time) and there is no cost to schools!

Regional Contacts and Organisers 2018

This is an exciting opportunity that you and your Senior Physics students will not want to miss, so we would appreciate it if you could please...

- Organise your own institution's support and involvement.
- Enter this event into your school's calendar.
- Circulate the accompanying flyer to advertise this event to schools in your local area and to give your students inspiration and ideas in the lead up to the lecture tour.
- Keep the AIP Organisers abreast of the organisation, the level of interest and the expected numbers.

It would be greatly appreciated if you could please cc me in to your correspondence with event organisers and/or other schools (Scott.Adamson@ahs.qld.edu.au) so that I may assist in the organisation of the events.

Of course, we would love to hear from you if you wish to assist with local promotion and/or organisation, or if you wish to explore the possibility of a teacher Professional Development session associated with the lecture tour.

Thank you, and we look forward to sharing this event with you.

Scott Adamson - on behalf of the AIP Qld Branch