

Profile:

Niraj Lal

follows the Sun



It's a love of the sun that brought Niraj Lal to Cambridge. The Gates Scholar from Australia is currently completing his PhD in Physics on 'Enhancing Solar Cells with Plasmonic Nanovoids' – using really small structures to make solar panels more efficient. And whilst England hasn't been the sunniest place to do research, Niraj (or Nij as he is known) has absolutely loved it.

Nij's particular research is to use miniature Buddhist singing bowls to concentrate light to increase the efficiency of solar panels. Singing bowls produce an unearthly musical resonance when they're rubbed, and Nij has developed a way to do the same thing with light for structures about 100,000 times smaller.

It is research that has brought fruitful results – he has three publications out with a fourth on the way, and was the only PhD student invited to present at the 5th International Conference for Surface Plasmon Photonics, held in Busan, South Korea where he was awarded the

Conference's Students Research Prize of 520,000 Korean won (about £285). It was the second conference Niraj has been invited to – in 2010 he gave an invited presentation at the Optics Society of America Congress, held in Karlsruhe, Germany. Nij's thesis explains why his organic plasmonic solar cells are 'orgasmonic' – giving four times more efficiency than similar flat solar cells.

Alongside his physics research, Nij has a passion for science outreach. Before coming to Cambridge, Nij worked with Scitech - the West Australian Government's Science Outreach program, taking shows about slime, bubbles, and fun science out on the road to thousands of schoolchildren including those in remote Aboriginal communities. He's continued with outreach in Cambridge and graduated in 2009 from the University's Rising Stars Public Engagement Program. During his time in Cambridge, Nij has appeared on the BBC Radio Naked Science program, written an article for them on 'How Solar Cells Work', and worked with disadvantaged secondary school students from the Cambridge region on the science of the future through the Wysing Arts Centre. He regularly gives shows to high-school students and the general public on 'The Science of Electricity' in addition to lecturing at the University's summer schools.

Away from academic things, Nij loves to stay active – he ran a marathon in 2009, was Captain of Football at Clare Hall in 2010, completed a triathlon in 2011 and this year will swim 5km for the Marie-Curie Swimathon. He founded the Purple Shin Football Competition at the Cavendish Laboratory, plays saxophone and didgeridoo in The Valence Band (made up of PhD students from the Cavendish), and drums in the Arco Iris samba band.

In October 2012, Nij will take up a 3-year Australian Solar Institute Fellowship at the Australian National University to continue research into solar cell physics. He's most excited about the fact that they are happy for him to work 9 days a fortnight – giving time to continue doing outreach, play with his 2-year-old nephew and go surfing.

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