

Australian Nanotechnology Network (ANN) – Young Nanotechnology Ambassador Award – Tristan Clemons

Nanotechnology Roadshow to the South West of Western Australia.

Introduction

Unfortunately it is no secret that Australian high school students entering into tertiary science degrees is decreasing. This is likely to be a result of many contributing factors however some of the major reasons would include, the poor public image of science amongst secondary students, a lack of understanding about jobs available in science within Australia and that science is at times difficult to understand. Through my discussions with school students and visits to schools it is clear that science and especially research science does not have the greatest public image amongst teenagers with many of the above misconceptions I have mentioned holding true. The major aim of my school visits was to discredit these misconceptions and present the truth about a career in science and



Students from Australind Senior High school observing what the ferrofluid sample can do.

especially nanotechnology as exciting and interesting with many perks and opportunities both here in Australia and abroad. I conveyed this message by drawing on my own positive experiences from my days as an undergraduate science student to my current term as a postgraduate researcher in nanotechnology at the University of Western Australia (UWA). I personally feel that the need for outreach into schools from scientists is integral to ensure the best and brightest minds continue in the sciences at a tertiary level.

With the support of the ANN through the nanotechnology student ambassador award I was able to develop hands on nano related resources and demonstrations which students were able to use and discover the wonders of the nanoscale. This was achieved by setting up a range of small stations where the students received a short information sheet describing the technology followed by instructions on what was happening and how to carry out the demonstrations. The stations included the following topics:

- Hydrophobic and Hydrophilic surfaces - students looked at the characteristics of water droplets on glass compared to Teflon coated glass and then compared this to how water interacted on ordinary cotton compared to that modified with a hydrophobic nano coating. Thanks must be given to NanoTex® for their support and generous donation of samples (<http://www.nano-tex.com/index.html>).
- Magnetics and Ferrofluids – Students here were able to see how ferrofluids interacted in a magnetic field and compared this to samples of

larger iron particles in water to see the stark differences nanoparticle size can have.

➤ Nano imaging with Quantum Dots and Gold Nanoparticles – This station consisted of a range of CdTe Quantum dots with different emission characteristics as well as gold nanoparticles of varying sizes to show students that particles of the nanoscale can interact very differently with light. Students enjoyed using light to excite the Quantum dots and learning about the process's behind their emission.

➤ Surface Area to Volume and Shape Memory Alloys – This station allowed students to investigate how altering the surface area of steel can dramatically change its reactive properties in a Bunsen flame. Students were also introduced and were able to investigate the exciting transformations and memory capabilities of some Nitinol shape memory alloy samples kindly donated by Johnson Matthey Corporation (<http://jmmedical.com/index.php?p=nitinol>).

➤ Nano ethics – Nano ethics was the final station students visited and this was an area where some background and opposing vies surrounding nanotechnology research were proposed and students were able to discuss important issues surrounding policy making, and regulation of research going forward.



Students from Georgiana Molloy Anglican School working with the shape memory alloy samples

The above workstations coupled with short informative videos from the NanoYou series (<http://nanoyou.eu/>) narrated by Stephen Fry made up the resource component of the visits. This coupled with my own personal insights into studying science at university and what exciting opportunities a PhD can offer made it easy to keep students engaged and interested throughout the sessions. The plan from the funding was to develop a set of resources which could be reused by any of the students within our research group on further outreach visits. This way the ANN and DIISRTE funded project will have lasting effects longer then my 2 days of school visits and hopefully beyond my time at UWA as a PhD student.

Schools Visited 7th – 8th June 2012.

Four schools were visited over a two day period in the south west of Western Australia. I felt it was important to ensure regional students were given the opportunity to see these resources and this was the main driving factor for deciding on the greater Bunbury region for the visits. Presentations were given to mainly science extension year 10 students as well as some year 11 and year 12 classes. We felt this was an important target audience with subject selection occurring during year 10 and university course selections occurring in year 12.

Thursday 7th June 2012

Georgiana Molloy Anglican School
Hawker Approach, Busselton WA 6280
<http://www.gmas.wa.edu.au/>

Bunbury Catholic College
Rodsted St., Bunbury WA 6230
<http://web1.bunburycatholic.wa.edu.au/>

Friday 8th June 2012.

Australind Senior High School
Break O'Day Drive, Australind WA 6233
<http://www.australind.wa.edu.au/>

Newton Moore Senior High School
Hotchin St., Bunbury WA 6230
<http://www.newtonmoreshs.wa.edu.au/>

Newspaper Article - Bunbury Herald June 12, 2012 - Bunbury Catholic College Visit. (24,000 copies distributed weekly to the greater southwest region.)



Georgiana Molloy Anglican School students talking science with me at the nano imaging station.

8 BUNBURY HERALD, Tuesday, June 12, 2012

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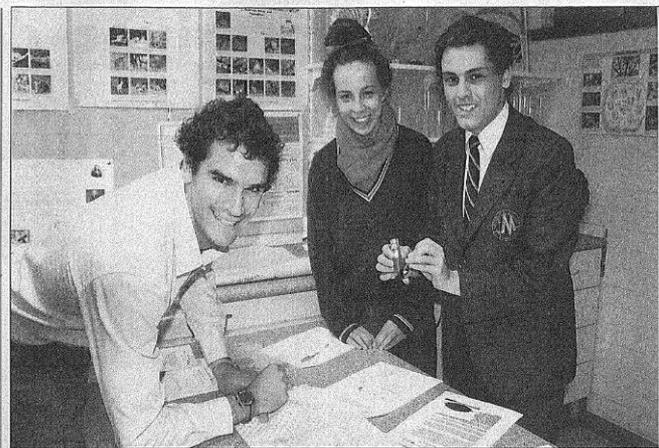
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Australian Kookaburras player Tristan Clemons showed Bunbury Catholic College students Megan Shine and Sebastian Schiano, both 15, how liquids with magnetic particles can be moved around with a magnet in his visit last week. PICTURE: ERIENNE LETTE

Students get a glimpse of big future in small things

By ERIENNE LETTE

AUSTRALIAN Kookaburras player Tristan Clemons showed off a side not many people know him for last week.

Mr Clemons is completing a PhD in nanotechnology at the University of WA.

Earlier this year, he won the WA award for the Australian Nanotechnology Student Ambassador Award which meant he could develop programs and activities to show students some things nanotechnology research could enable them to do in the future.

Mr Clemons — originally from Bunbury — said he chose to come to schools in the South West because the science opportunities were not as easily accessible as they are in Perth.

"It's about getting kids excited for science," he said.

"They get to see what they could get to do in the long run which is good when they might feel they're getting bogged down by the books.

"I get to open their eyes to what I do and show off how lucky I am."

Students participated in a variety of activities including ones that were originally pioneered by NASA.

Mr Clemons' PhD is investigating how nanotechnology can improve drug delivery in spinal cord injuries, with an ultimate aim of improving recovery.

He said it was great to talk to the students about things that were 1000 times smaller than a human hair.

"It's really good to see the kids getting involved and getting excited," Mr Clemons said.