

Astronomy on the Go

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How often do two thousand of the world's leading astronomers come to one's country? Not often! So was born the idea for 'Astronomy on the Go', to take advantage of the publicity that would be generated by the presence of over two thousand professional astronomers (one quarter of the world's total) at the International Astronomical Union's twenty-fifth General Assembly, in order to run a science outreach program, and do our best to stimulate interest in the sciences through our natural wonder about the stars. Over most of Australia, outside the major cities, people are generally aware of the spectacle of the night sky, there being relatively low levels of light pollution over Australia due to the low population density. No time is better to watch the Milky Way than in winter (for visitors from the North – that's now!), when the centre of the Galaxy passes directly overhead at midnight from the latitude of Sydney. Astronomy on the Go aimed to take advantage of both our natural curiosity about the Universe and the stellar display of the winter sky to motivate a public outreach program in science.

Astronomy on the Go was actually being run by science students from the University of New South Wales. Equally as important as bringing science to the public is the training of scientists with the skills to talk about their work in a comprehensible matter, and giving them the confidence to do so. We must hope that they can do better than the current generation of scientists in communicating the importance of science to the functioning of modern society, especially given the low levels of science literacy apparent across much of it. A large part of the program involved training some of the current crop of university students so that they could go out and talk about science in an entertaining and informative way. Astronomy on the Go thus started during the final session of the 2002 university year with the recruiting of students for the program. Around twenty-five put their hands up, with in the end some twenty participating. Some were postgraduates doing PhDs in astronomy, others were undergraduate physics students, while yet others were studying science communication, majoring in the biological sciences and not studying the physical sciences at all. Indeed one of the successes of Astronomy on the Go has been the bringing together of students from different disciplines, and their learning from each another through the different skills they each brought to the program.

Astronomy on the Go consisted of four distinct elements. The last two of these took place during the GA. These are two Science in the Pub events, on July 16th and 23rd, in the Harlequin Inn, just five minutes walk from the Convention Centre, and a special Schools' Day in the Convention Centre on the 24th (during the time of the GA itself). However the major part of Astronomy on the Go has been the three tours conducted of regional New South Wales, visiting high schools during the daytime and conducting a 'Starry Starry Night' presentation in the evenings.

Before we could head out on the tours, though, we needed to learn what to do. So the first part of the program was to visit, in May this year, six schools around the Sydney metropolitan area. And before that we had to practice our presentations so that we wouldn't appear too raw to the school children! There were two types of presentations we gave, talks about the solar system or about

the stars, and project SEARFE. Our talks were fairly conventional in nature, pretty picture slide shows of everybody's favourite astronomical objects. Project SEARFE was rather different, however, with the focus being on radio astronomy. It was an initiative from the University of Sydney, and then conducted with extensive support from the CSIRO (Australia's national science organisation), and aimed at the final year physics classes at school (the HSC year in Australia). A broadband, omni-directional radio antenna + receiver + PC was used to conduct an experiment measuring the radio emission background at the school, and incorporated into a presentation which discussed radio waves and radio astronomy, while featuring some of the key physical ideas associated with their detection and measurement. As part of the exercise the students conducted two 'standard' measurements of their radio frequency environment and then were given a disk with their data for them to upload on to the Astronomy on the Go website, for comparison with similar scans made at schools right around Australia. As you may have guessed by now, there was also a deeper message being given here, that Australia's RFI environment is among the lowest on our planet, with large areas of virtually uninhabited land over much of the continent, which also provides the most suitable location for the next generation of radio telescopes, LOFAR and the SKA.

To come back to the outreach program, our first task then was to prepare the presentations and practice them amongst ourselves, before then heading off to schools around the Sydney metropolitan district where we tested ourselves against our audience, the high school students. It was a learning experience all round! Most classes were very receptive to us, and the questions would flood in. But not with Year 10 classes! At that age it is just not cool to communicate with your teachers or to ask questions. Didn't we all pass through such a bellicose stage when we were about sixteen?!

The tours started in early June and lasted until just before the GA started. We conducted three tours, and imaginatively named them the Southern, the Western and the Northern tours for the directions they set off from Sydney. A different group of students ran each tour, travelling around in a van which affectionately acquired the name "Daisy", through a story which can only be told by the students, and involves some of the bovine life encountered along the way. Each tour visited around five country towns along their cardinal directions, spending the days at high schools and the evenings with public presentations. At each school we would end up giving typically five or six presentations through the day. They would range from small groups of a dozen HSC-year students for SEARFE, to individual classes for some talks, to an entire year of 100 or more students for others. The latter could be quite challenging at times, especially if there was no microphone to drown out the sounds of excited chatter!

The evening entertainment was a presentation we called "Starry Starry Night", and featured an interactive discussion about the heavens, while viewing the changing colours of the sky from sunset until it became fully dark. We would talk about some of the features apparent in the sky, and use them to include a discussion of how modern science came into being through the process of quantitative measurement and analysis pioneered by the Renaissance astronomers. We would also bring in some of the cultural aspects of the night sky, legends from past civilisations, including some aboriginal mythology. In places where the sky was truly dark we were able to point out that most spectacular, and unexpected, "constellation", the Emu of aboriginal legend. If you get the chance to get outside Sydney look for it yourself, for it is quite striking, made up of

the dark clouds spread along 30° of the Milky Way, from the Coalsack in Crux, to Sagittarius. Every Starry Starry night presentation had to be different, tailored for the local conditions. Sometimes we were lucky enough to be at an Observatory on a dark sky site, and the true wonder of the southern sky could be seen. Other sites were in town parks with streetlights around, and at other times we would be foiled by clouds. So we had a number of indoor presentations in readiness to complement the sky viewing, using planetarium software to show the motions in the sky, and a portable planetarium, as well as slide shows and the SEARFE equipment.

One of the activities we conducted is one you can join in yourself – a star counts exercise! Using a number of star maps drawn to different magnitudes of the South Cross to Pointers region, familiar to just about every Australian, the object was to find just how dark the sky was at your home by matching the charts to the sky above and seeing which one most closely resembles it. Download the activity sheet from the Astronomy on the Go website (see below for the URL), then enter the results through a web form, and compare with what others have found.

The website has been one of the features of Astronomy on the Go, providing not only the detailed itinerary for the tours and the program of presentations, but as a means of communication amongst the participants. Read the daily Blog that the students wrote on each tour, and then view the extensive picture gallery they compiled. Databases were also set up so that participants in SEARFE and the Dark Skies projects could also download their results and compare with participants elsewhere, and find the darkest sites in the State, both for radio astronomy and for optical astronomy.

Putting Astronomy on the Go together has been an exhaustive process, involving much more than what was naively anticipated when we started last year. By the time we finish there will have been around 130 public presentations, of one sort or another, given to a total audience of about 10,000. Has it been worth it? Yes! Just to look at the students, exhausted but enthused, after a days talking astronomy to a diverse range of people is to know that it has worked! Producing quantitative statistics to satisfy an accountant may be another matter, but we all have no doubt that we've managed to inspire more than a few people along the way on our perambulating route around New South Wales!

Participants: UNSW staff—Michael Burton, Will Rifkin, Anita Pavic, Amy Winter. UNSW students—Marton Hidas, Tracey Hill, Steven Longmore, Cormac Purcell, Yael Augarten, Beau Bellamy, Michael Day, Mathias Kanzelsperger, Dorota Kubuj, Carmen Li, Juanita Mintono Phang, Jason Moore, Sherlin Ng, Dean Nicolson, Kylie Rivero-Glover, Liz Tay, Uwe Zell.

Metropolitan Schools: Catherine McCauley, Wenona, Mt Carmel High, Heritage College, Newington College, South Sydney High

Southern Tour: Batemans Bay, Nowra, Goulburn

Western Tour: Bathurst, Kelso, Mudgee, Dubbo, Cowra, Lithgow

Northern Tour: Taree, Port Macquarie, Westport, Coffs Harbour, Armidale, Tamworth

Science in the Pub: July 16th and 23rd at the Harlequin Inn.

Schools Day: July 24th in the Sydney Convention Centre.

Astronomy on the Go website: www.phys.unsw.edu.au/outreach

Sponsors: The U Committee and the Faculty of Science of the University of New South Wales.

Pictures: see Astronomy on the Go website for an extensive collection.

Astronomy on the Go in a Nutshell: see below for complete itinerary for the program.

Astronomy on the Go In a Nutshell

www.phys.unsw.edu.au/outreach

*A science outreach program for the
International Astronomical Union General Assembly, Sydney July 2003*

Metropolitan Area Visits

- May 1: Catherine McCauley School, Five presentations
- May 5: Wenona School, Five presentations
- May 7: Mt Carmel High School, Four presentations
- May 8: Heritage College, Three presentations
- May 21: Newington College, Eight presentations
- May 30: South Sydney High School, Seven presentations

The Launch

- June 4: School of Physics, University of New South Wales

Regional Tours

Southern Tour

- June 9: Public Talk, Batemans Bay High School, Michael Burton “Our place in the Cosmos” (Steve Wallace, 4472-7233)
- June 10: Batemans Bay High School, Six presentations
- June 10: Nowra High School, Three presentations
- June 11: Nowra High School, Seven presentations
- June 11: Starry Starry Night, Nowra High School (Vicki Templeton, 4421-4977)
- June 12: Starry Starry Night, Goulburn High School (Vero Joseph, 4821-4022)
- June 13: Goulburn High School, Six presentations

Western Tour

- June 16: Bathurst High School, Six Presentations
- June 16: Starry Starry Night, Bathurst Observatory (Ray Pickard, 6337-3988)
- June 17: Kelso High School, Three presentations
- June 18: Mudgee High School, Six presentations
- June 18: Starry Starry Night, Mudgee Observatory (John Vetter, 9718-6314)
- June 20: Dubbo Senior College, Two presentations
- June 20: Dubbo Primary School, Two presentations
- June 21: Starry Starry Night, Dubbo Observatory (Peter Nielson, 6885-3022)
- June 23: Cowra High School, Four presentations
- June 24: Starry Starry Night, Derby Falls Observatory, Cowra (Markham Monk, 6435-1900)
- June 25: Starry Starry Night, Lithgow Hill School Oval (Lee Middleton, 6352-1422)
- June 26: Lithgow High School, Six presentations

Northern Tour

- June 23: Taree High School, Five presentations
- June 23: Starry Starry Night, Taree Park (Peter Baker, 6552-1166)
- June 24: Public Talk, Port Macquarie Observatory, Michael Burton “Stardust, the stuff of life”(Jim Daniel, 6583-1933)
- June 25: Westport High School, Seven presentations
- June 25: Port Macquarie School of the Air
- June 27: Coffs Harbour High School, Six presentations
- June 28: Starry Starry Night, Coffs Harbour High School (Giorgio Dal Pozzo, 6652-3466)
- June 30: Armidale High School, Three sessions
- June 30: Starry Starry Night, Armidale High School (Kevin Birkett, 6772-7466)
- July 2: Tamworth High School, Four presentations
- July 2: Starry Starry Night, McCarthy Catholic College, Tamworth (Ian Evans 6761-0800)

Science in the Pub

- July 16, Harlequin Inn, Pyrmont, “Life the Universe & Everything” with Fred Watson and David Malin, compered by Alf Conlon
- July 23, Harlequin Inn, Pyrmont, “What is a Planet?” With Penny Sackett, Pat Roche, Gibor Basri and Chris Tinney, compered by Fred Watson

Schools Day

- July 24, Sydney Convention Centre. Talks + IMAX + Expo (Anita Pavic, 9385-7311)
 - Charley Lineweaver: “Where is the Universe heading?”
 - Michael Burton: “Stardust—the stuff of life”
 - Maria Hunt: “The search for life in the Universe”
 - John Storey: “Astronomy in Antarctica—the quest to build the Earth’s ultimate telescope”

The Team

- Academics: Michael Burton and Will Rifkin
- Science Student Centre: Anita Pavic and Amy Winter
- Postgraduate students: Marton Hidas, Tracey Hill, Steven Longmore & Cormac Purcell
- Undergraduate students: Beau Bellamy, Carmen Li, Dean Nicolson, Dorota Kubuj, Helen Zhou, Jason Moore, Juanita Mintono Phang, Kylie Rivero-Glover, Liz Tay, Mathias Kanzelsperger, Michael Day, Sherlin Ng, Uwe Zell, Yael Augarten

Sponsors

- The U Committee, University of New South Wales
- Faculty of Science, UNSW
- School of Physics, UNSW
- SEARFE: U. Sydney, CSIRO, UNSW, UTS, IBM, BAE Systems, Institute of Engineers, Perth Observatory, Australian Geographic