‘Talking the talk’ – Project Partner Meetings

Recent meetings have been held with executives of our key education partners to discuss strategies for professional development and project implementation. The emphasis was on further training keen and interested Science and Physics teachers via deeper engagement with the new modules and resources. These new teaching modules focus on student learning through informative and entertaining videos, games, activities, and speculating on the scientific outcomes. They have been successfully trialled in several schools and have shown very positive results, even where the students were initially reluctant.

Sue Walsh, Head of System Learning at the Catholic Education Office, Parramatta and Paul Stenning, Manager of Science Education Initiatives, met with Chief Investigator (CI) Professor Quentin Parker to develop the new ‘clusters’ geographical area strategy. This is designed to initially intensively train a limited number of engaged science and Physics teachers, which is followed up with close team support, particularly at the implementation stage.

This strategy was taken to the Principal’s Network Meeting, to generate further engagement and interest across the Diocese, and led to a large variety of Science teachers being represented at the training days using this new strategy, which is expected to foster greater engagement.

The Director of the DET Western region, Carole McDiarmid and Teaching and Learning Coordinator, Anne Marceau, also recently met with CI David McKinnon and Dr Lena Danaia to discuss training options for the region. A full-day training session early in Term 3 is initially scheduled, with followup training expected to be carried out via Video Conferencing to school Science teachers and Distance Educators.

David and Lena also met Warren Frew, who is newly appointed to the role of Schools Education Consultant at the Catholic Education Office, Bathurst and Phil Owen, Project Coordinator from La Salle College. Warren was introduced to the project and the group further developed training and implementation strategies. The preliminary training day will combine the DET Western and CEO Bathurst regions in Orange. Subsequent and ongoing training and support for the Catholic Education Office, Bathurst teachers will then be provided by the project team members.

Image above: Portion of NGC2175, an emission nebula in the Orion constellation, colour imaging by Anthony Prasad, Nagle College
Clusters’ training strategy – CEO Parramatta

The first of 5 inter-dependent training days was held at the Learning Exchange, Aengus Kavanagh Centre, Mt Druitt 27 May 2011, presented by A/Prof David McKinnon and other team members. CEO Parramatta diocese was divided into 4 geographical regions - Penrith, Hills/Hawkesbury, Blacktown and Parramatta.

Enthusiastic teachers from all-girls, all-boys, co-educational, systemic and independent schools learned and trained together as a foundation for further teacher networking and mentoring for the project into the future. Discussion about pedagogy and resources was encouraged through the day.

The path of the professional development training followed the same one that students take when implementing the project: installing and testing the Information Technology, moving onto data completion, learning leading to discovery, familiarisation, understanding, deeper study and research.

The history of the project and the Faulkes Telescopes was reiterated, followed by a group jigsaw activity to research targets and present a case for imaging that target. A shortlist of potential targets was requested from Las Cumbres Observatory Global Telescope Network, the owner of the Faulkes Telescopes, for colour imaging on Training Day 2.

For ease of use, USBs were pre-loaded with the new modules and the required software links. Faulkes Telescope data taken with red, visual (green) and blue filters, that initially appeared as black and white, were transformed into coloured images for learning the software tools and techniques. Professor Quentin Parker then judged the images and provided valuable insight into what can normally be interpreted from the colouring. The participants also had the opportunity to view the other images then vote on their favourite results.

The variations of the image colours and methods shown on Page 4 by the attendees at the CEOP Clusters training day demonstrated the range of outcomes that can be produced. More photos and images will be uploaded onto our new Outputs page (http://www.physics.mq.edu.au/astronomy/space2grow/outputs). Our front-page image was created after the workshop by Anthony Prasad.
Macquarie University Centre for Astronomy, Astrophysics and Astrophotonics announced

The Macquarie Astronomy, Astrophysics and Astrophotonics Research Centre (MQRC AAAstro) was officially launched by Professor Jim Piper, Deputy Vice-Chancellor, Research at the Macquarie University Art Gallery on April 28th. This new research centre, led by our very own Quentin Parker, has ties to over 100 national and international universities, observatories, research institutions and commercial companies in 23 countries. This provides a solid network for effective multi-national collaborative research programs. Science education is one of the major cross-faculty, inter-departmental activities. With its planned growth in research, the centre is predicted to be among the top four or five astronomy cohorts in Australia soon, alongside the Australian National, Swinburne and Sydney Universities.

Apart from exciting mainstream astrophysics research programs, and strong growth in the emerging cutting-edge field of astrophotonics, the centre has many other major projects already underway, such as the Space to Grow project.

There is also a strong focus on building links to the Indigenous community by engaging the Aboriginal Astronomy Research Group dedicated to researching the astronomical knowledge and traditions of Indigenous Australians, which also feeds into education.

The collaborations that this new centre will create and encourage are sure to see a strong growth in outstanding research outputs in astronomy, astrophysics, astrophotonics and science education at Macquarie University. Professor Parker credits Macquarie University for supporting astronomy so strongly over the last eight years and allowing the group’s potential to be realised. The support of the Australian Astronomical Observatory (AAO), as the major external partner, and the Australian Research Council, have also been crucial to the group’s spectacular growth.

Feature Teacher

Anthony Prasad (shown right with his image of Planetary Nebula NGC6781 at the PD day) from Nagle College has embraced the Space to Grow project with Years 10 students in 2010 and Year 11 students in 2011.

Anthony saw the opportunity of being able to access the Faulkes Telescopes as a way to involve them in real-time investigations. Additionally, the Colour Magnitude Diagram work for open and globular clusters fitted the curriculum very well.

Describing the students as focussed and interested, he noticed how having ‘ownership’ of their requested and processed data has had a big impact. They are now even keener to undertake further research for finding and investigating currently unstudied targets.

Anthony views the changes to the module format and content, plus the Professional Development, very positively. Other avenues of investigation on his list of topics that he would like to pursue are measuring the mass of binary stars and distances of galaxies.

His colleague, Martie Bruton, is taking Nagle College’s Year 10 science students this year, with similar levels of interest from students.
**Image matters - ‘Walking the walk’**

The following images were created by the Science and Physics teachers at the CEOP Clusters training day in May. More can be seen on our new Outputs website page (see link on Page 2).

Interacting Galaxies NGC2207 (r) and IC2163 (l)

Planetary Nebula NGC2346 AKA The Butterfly Nebula - colour 1

NGC2346 - colour 2

Planetary Nebula NGC5189 AKA Gum47, IC4274, RCW76 or Spiral Planetary Nebula

Spiral Galaxy M64 AKA NGC4826, The Black Eye Galaxy, Evil Eye Galaxy or Sleeping Beauty Galaxy - colour 1

M64 - colour 2

M64 - contour

Spiral Galaxy M101 AKA NGC5457 or The Pinwheel Galaxy

**Secret answer puzzle - Easy**

Enter all answers across in the shaded squares. Once completed, read down in the “S” column to find the common theme of the puzzle.

1. Regular rise and fall of the sea, due to gravitational pull of the moon and sun (plural)
2. The envelope of gases surrounding the Earth or another planet
3. Our galaxy (2 words)
4. Period of 24 hours, corresponding to a rotation of the Earth on its axis
5. Curved path of a celestial object or spacecraft around a star, planet or moon
6. Four divisions of the year resulting from Earth’s changing position with regard to the sun
7. The ‘Red Planet’, named after the Roman God of War
8. Sixth planet circled by a system of broad, flat rings
9. Our planet
10. The natural satellite of any planet

**Diary Dates**

<table>
<thead>
<tr>
<th>Date</th>
<th>Event/Conference</th>
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<tr>
<td>29 June – 2 July</td>
<td>ASERA conference University of South Australia [<a href="http://www.conasta.edu.au/">http://www.conasta.edu.au/</a>]</td>
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<tr>
<td>10 - 13 July</td>
<td>CONASTA conference, Darwin High School</td>
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<tr>
<td>19 July</td>
<td>CEOP Clusters Training Day 3, Mt Druitt</td>
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<tr>
<td>25 July</td>
<td>Combined DETW/CEOB Training Day Canobolas Rural Technology High School Orange</td>
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<tr>
<td>3 - 21 August</td>
<td>National Science Week</td>
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