MACQUARIE UNIVERSITY
SYDNEY ~ AUSTRALIA

CHARLES STURT UNIVERSITY

ARC Linkage SPACE TO GROW Project Newsletter 7 - October/November 2010

Your SPACE TO GROW project NEEDS YOU!

The baseline data that underpins the Space to Grow project's educational research is *urgently* required.

To increase the current overall completion rate of 25%, we have 'upped the ante' and students could now be in the running to win a $50 *iTunes music voucher* (or similar). Teachers can help their students to win a prize by mentioning the incentives in class.

Are your students 'in the know'?

Although reminder emails have been forwarded directly to students in the database about the incentives and to let other classmates know, quite a number of the emails have bounced.

All students need to do is complete their questionnaire and Astronomy Diagnostic Test online at http://www.physics.mq.edu.au/astronomy/space2grow/questionnaires. Individual pages can be submitted separately and resumed later if necessary. Winners will be notified by email and the voucher will then be sent upon confirmation of details to the school. To be eligible:

- 80% of that Year group overall must fully submit SSSQ and ADT data for any student in that group to be entered into the draw
- Names will be drawn randomly from that 80+% group. *Each school 'Year' can be awarded up to 3 prizes from $50-$20, depending on numbers:*

1 - 10 pupils = 1 prize 11 - 20 pupils = 2 prizes 21 + more pupils = 3 prizes

Test the website resources

Now that major exams are out of the way and timetables are less frantic, Term 4 is an excellent opportunity to gain practice and confidence familiarising yourself with the Space to Grow project. Check out the newly revised Star Clusters module incorporating 'backward faded scaffolding', play with the interactive links, explore the resources, introduce the project, and think about the new data for study - perhaps a scientific paper may be the result? As always, the team is here to help!

Features: Star Project Partner, Feature Teacher, Module 'model', Quiz, In the News, Quiz answers

Australian Government Australian Research Council LCOGT.net CatholicEducation NSW Education & Training Catholic Education Office

Star Project Partner – DET Western

The Department of Education and Training, Western's Regional Director, Carole McDiarmid, supports the principals while front-line teaching staff in 198 schools provide comprehensive education from Kindergarten to Year 12 in their own communities. Covering around 385,000 square kilometres of New South Wales, it stretches from Lithgow in the central west to Broken Hill in the far west, north to Goodooga, south to Wentworth, and incorporates Siding Spring Observatory.

DET Western is a leader with information integration and communication technologies into teaching and learning to develop the skills needed for 21st century life. The remote area students access a variety of interactive learning experiences.

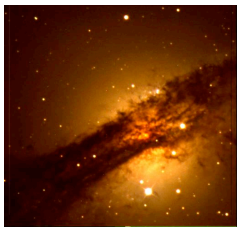
Selective high school provision, vocational education and training courses as well as comprehensive subject choices in high schools allows students to tailor their education for a particular career pathway.

DET Western's Teaching and Learning Coordinator, Anne Marceau (pictured far right), with Senior Curriculum Advisor Gaye Hoskins, attended the workshop at St Columba's College to acquaint themselves with the revised Star Clusters module. With a Physics teaching background, Anne liaises with the science teachers of the region to encourage introduction of the project in the classroom.

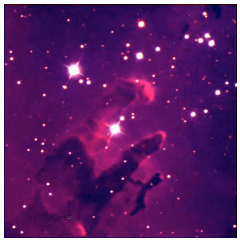
Feature Teacher

Craig Luccarda, Head Teacher of Science at Denison College, Bathurst High campus in the DET Western region, realised the potential of *Space to Grow*. He saw it supported three important faculty priorities of extending more capable Science students, implementation of DER, and long-term retention of students from Stage 5 into Stage 6, Physics.

Introducing it to the top streamed Year 10 Science classes expecting this was where the majority of the school's future Physics crop lay, he also hoped it would intrigue other students enough to take up Physics in Stage 6.



Due to some issues with software and school networks, students were able to continue the process via access to the CSU facilities. The two top classes were split based on gender to gauge the male and female reaction, as they are always striving to increase female participation. There was some variation in technology skills possessed by students, however this was overcome and students completed the mosaic exercise and the colour imaging exercise and produced the great results shown of *Centaurus A (**NGC 5128**) left, and Eagle Nebula (**NGC 6611/M16**) below left*.



Craig advises they have been exceedingly lucky to also have the support of A/Prof. David McKinnon and Dr. Lena Danaia at CSU to guide them. David has since given Craig a 'heads-up' on the revised Star Clusters module. They have arranged to run the Physics class of 2011 through the advanced modules during the last few weeks of Term 4 as an official post School Certificate activity for the school.

Tools of Engagement trialled in revised Module 'Model'

'Backward faded scaffolding' underpins the totally revised *Star Clusters* module developed by A/Prof David McKinnon and PhD student Michael Fitzgerald. This teacher pedagogy provides a strong basic structure for students' science learning initially. Having this gradually withdrawn then allows students to question and theorise on the next step in the process. Similar 'tools of engagement', such as short films, demonstrations and other activities, will be included in revisions to other modules also.

Faculty and staff at St Columba's College in Springwood (above right) hosted the Space to Grow team and participants for the intensive training day on October 18. Prof. Quentin Parker welcomed attendees and asked them to provide feedback in their triple 'roles' as students, teachers and critics of the new learning model.

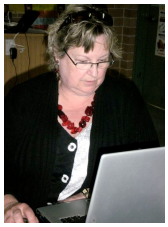
'What teaching should be like'

David McKinnon led the training with a short film by Prof. Fredrick Watson on Star Clusters produced especially for *Space to Grow*.

Feedback received on the relevance of actual science learned, and the teaching model, together with demonstrations and activities allow for further development. One such comment advised it was 'what teaching should be like.' Teachers can take ownership of the module in the classroom, as it divided into ready-made lessons aimed at particular aspects of the subject overall.

Several student 'games' help reinforce the skills and knowledge. Our Quick Quiz in Issue 6 also focuses on Star Clusters.

Above: participants and team members enjoy lunch at St Columba's on-site radio dish, during the workshop, right



Quick Quiz (answers back page)

1) What small celestial body was noted in Chinese records around 240BC? **2)** It reappeared at which famous battle? **3)** Name the Space to Grow team member who has a numbered periodic comet 119P named after him/her? **4)** Name the Great Comet of 2007? **5)** The sun's radiation begins to vaporise the ices of the nucleus, releasing gas and dust, which can appear to be arc-shaped due to solar wind creates what feature? **6)** Which spacecraft crossed Comet Hyakutake's tail over 500 million km from the nucleus, showing it had the longest comet tail known?

Macquarie University Research award

Prof. Quentin Parker accepted the Macquarie University Science and Engineering award for Excellence in Research on behalf of the M*A*S*H *(Macquarie AAO Strasbourg H-alpha planetary nebula project)* team on October 27.

The highly competitive category covered submissions from Science, Medicine, Engineering and Chiropractic faculties. Planetary Nebulae have been a passion for Professor Parker and this has been transferred to several PhD students, including Dr David Frew, a Space to Grow postdoc.

The Space to Grow project will benefit from this subject knowledge with a revised module developed using the Star Clusters 'model'.

Photos: Prof. Jim Piper, Deputy Vice Chancellor of Research at Macquarie (r) presenting the award to Prof. Parker (top)
*Three of the M*A*S*H team members from Macquarie University at the awards night - Dr W Reid, Prof. Parker, Dr D Frew (above)*

NASA investigates Siding Springs comet discovery

Australian Astronomical Observatory Astronomer Malcolm Hartley at the UK Schmidt Telescope, pictured with Faulkes Telescope South, has 10 comets named after him. Comet Hartley 2, first discovered in 1986 and orbiting the sun every 6.46 years, was targeted by NASA for closer scrutiny.

Their EPOXI spacecraft flew within 700 km of Hartley 2 on 4 November (US time) to carry out detailed observation of the small and unusual comet. NASA invited Malcolm to California to witness first-hand as it looked for frozen compounds on the comet's surface to map outbursts of gas *right,* the distribution of craters and temperature variations across its surface.

Comets are intriguing members of our solar system and targets of opportunity for the Faulkes Telescopes.

Another New Star

Dr David Frew and wife Sofia have recently celebrated the safe arrival of their son Alastair. Congratulations to all of the family from the *Space to Grow* team**.**

Quick Quiz answers

1) Comet Halley **2)** Battle of Hastings 1066 **3)** Quentin Parker, Parker-Hartley 1989 **4)** C2006 P1 – Comet McNaught, pictured *right* by Akira Fujii **5)** The tail **6)** Ulysses

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