Cutting Edge Science

Presenter	Workshop Description	Max. Participants
Workshop Group 1		
Professor Clyde Wild **Dean, Academic SEET Group** **Griffith University**	**Biodiversity – The Age of Insects** This presentation exposes the often-overlooked world of insects and their importance to mankind for both the services and threats they present. A particular focus will be paid to local examples and their impacts on the environment and human endeavours. The presentation will be complimented by stunning imagery of the organisms detailed. **Suitability: All Participants**	**Unlimited**
Mary Rowland **Secondary Science Teacher Waterwise Schools Program** **Education Queensland**	**Diving into Primary Science: understanding the science of water in the Australian Curriculum** There are lots of content descriptors to be covered in the Australian Curriculum: Science. Fortunately, an understanding about water, how it behaves, how it moves through our ecosystems and how we impact it addresses many of them. This session will provide lots of teaching ideas designed to develop student understanding about the science of water. Participants will receive a copy of the current version of the Water Learn it for life! Curriculum DVD and info about other free resources that will be useful for teaching water topics. **Suitability: Primary School Teachers**	**30**
Dr. Graham Jenkins **School of Engineering** **Griffith University**	**A Work Integrated Learning Approach to Teaching Water Resources Engineering** Traditional engineering courses usually focus on curriculum built around a fairly narrow engineering science context in which lecturers pass on knowledge to students in a relatively passive way. This traditional approach to engineering education often fits comfortably with many students, who have built their skills around solving problems, which have been constructed around the solution of constrained engineering equations. Many engineering students quickly learn that achieving high marks in engineering course work is often all about getting the "correct answer" to a solution method which has been spelt out in lectures by the teacher. In contrast, the sustainable management of water resources in Australian urban communities involves the integration of a broad range of issues covering social, environmental, economic and engineering aspects. Facilitating student learning around this type of engineering topic requires an approach to curriculum and assessment design which places far more emphasis on these integrated issues. This workshop describes the development of a water resource engineering course, which uses a work integrated learning approach. The course, which is an elective course, is designed to prepare students for a professional team-working environment by investigating a current water resource issue. It is built around a project which has been structured so that students are better able to appreciate the way in which theory and practice combine to make them more "work ready". Students are also introduced to the conceptual design process for a piece of water and environmental infrastructure. This workshop describes the structure of the water resources engineering project and highlights the way in which it has been designed to engage and motivate students to learn about the broad social, environmental, economic and engineering issues facing the development of urban water resources.	**30**

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	Suitability: All Participants	
Dr Changming He **School of Information and Communication Technology** **Griffith University**	**Complex Action Visualisation (CAV) Lab** Using 3D projection screens and a video-based tracking system, the Complex Active Visualisation (CAV) lab gives users a unique perspective of being inside the data. My research is about scientific visualisation in the virtual environment. **Suitability: All Participants**	**20**
Associate Professor Richard John **Program Leader, Science on the GO!** **Griffith University**	**Alternate Conceptions in Science: Part 1 – Fictitious forces and water down the plug hole (Please note that this is a 2-hour workshop)** This workshop will literally take you on a ride through Newton's laws of motions in one, two and three dimensions to answer the age old question of which way water goes down the plug hole. Starting from common everyday experiences you will delve into Newton's laws and learn about the mysterious fictitious forces, learn a bit about the theory of relativity (don't be frightened it's not that difficult), find out about things called "frames of reference" and work out how to fire an intercontinental ballistic missile while having lots of fun throwing balls around. Don't be frightened because its physics – its phun and not difficult at all. Designed for the absolute beginner in physics. Surely Bart and Homer couldn't have got it wrong!? When you flush the toilet or pull the plug out of your sink or bath, the water goes down the plug hole in a clockwise direction in the southern hemisphere and in an anti-clockwise direction in the northern hemisphere. Everyone knows this! … but is it true or is it a common misconception? Let's find out when we investigate the effects of the mysterious Corriolis force that was so famously immortalised by Bart and Homer Simpson in their trip down under. **Suitability: Primary School Teachers, Junior Secondary Teachers and Non-Physicists**	**25**
Dr Suzzanne Owen **Health Development Coordinator** **Griffith University**	**Clinical Homeostasis** Engage with the clinical side of science. Participants will look at the physiology of the heart form a clinical perspective. ECGg and Spirometry testing for all. **Suitability: Biology and Science Teachers**	**20**
Workshop Group 2		
Dr Jan Olaf Meynecke **Australian Rivers Institute** **Griffith University**	**Spot on Science – how to make a science microdoc** The years ahead will bring challenges for Australia which can only be mastered using the expertise of scientist. Raising interest in Science for the next generation of Australians is therefore crucial. Short videos on Blogs, Facebook and You Tube are frequently used by students to access quick and easy information. It is therefore a logic step to include	**30**

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	microdocs as a carrier for science communication. This session explores the possibilities and difficulties that short science documentaries can bring into your classroom. A "how to do your own" science microdoc guide is presented and a few examples are given. **Suitability: Secondary Science Teachers**	
Theresa Thompson **Toohey Forest Environmental Education Centre** **Griffith University**	**Local Freshwater Investigation** The aim of this hands on workshop is to provide teachers with the knowledge and skills to conduct a local freshwater investigation with their students. The session will cover risk assessment, equipment, sampling techniques, identification of water creatures and how to assess the water quality. This session is suitable for teachers with limited to no budget for equipment and reference materials as well as guide those with a budget looking for professional equipment. Teachers do not require any previous knowledge or experience in fieldwork. Ideal for primary or lower secondary teachers who are interested in looking at human impact, local area studies, water catchment health, adaptations, food chains and classification. **Suitability: Primary or Lower Secondary Teachers**	**25**
Charles Hacker **School of Engineering** **Griffith University**	**Electronic Construction** **(Please note that this is a 2-hour workshop)** In this hands-on laboratory session, participants will build a flashing light circuit, similar to the warning lights utilised in many emergency vehicles. The circuit components are provided from inexpensive, easily obtainable kits, and are constructed on a solder-less circuit board. This workshop provides a good introduction to how electronic construction projects can be easily undertaken within a school environment. Participants get to take away their completed projects. **Suitability: All Participants**	**16**
Dr. Vallipuram Muthukkumarasamy **School of Information and Communication Technology** **Griffith University**	**Security and Wireless Networking: Threats and counter-measures** Proliferation of wireless technologies and easy access to smart devices in an online world introduce increasing security challenges without geographic borders. Ever growing dependency on networked resources and systems and increased complexity in the underlying software stacks demand innovative security solutions. eSecurity characteristics and fundamental assumptions in various security mechanisms will be analysed. Current status, limitations and future research directions on privacy and security issues related to different applications including eHealth with smart phones will be discussed. **Suitability: All Participants**	**30**
Belinda Gustavson and David Wilkinson		**30**

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Primary Science Fascilitators **Education Queensland**	**What, Science is Engaging?** Belinda and David will be presenting a reflective presentation on a year 3 class' scientific journey. Participants will see, hear and do some of the science activities that the students participated in as well as finding out how lower years children design, complete and collect data for scientific investigations. **Suitability: Primary School Teachers**	
Workshop Group 3		
Pauline Armstrong **Senior Health and Safety Consultant** **Education Queensland**	**DET Workplace Health and Safety** This session will discuss the need for workplace induction and documentation, CARAs, WH&S Legislation changes, common Science incidents and how to avoid them, and how to access relevant WH&S info for both EQ schools and for Independent schools who cannot access the EQ network. **Suitability: Primary or Lower Secondary Teachers**	**30**
Adriana Bauer and Paul Brandon **Senior Project Officers; Biodiversity and Primary Science** **Queensland Museum**	**Queensland Museum learning resources linked to the Australian Science Curriculum** Resources that have been developed during 2011 to support the implementation of the Australian Science Curriculum will be showcased in this session. These are aimed at a Primary Science level (P-7) and include new Loans kits which focus on object-based learning, online resources, videos, and teaching units. Lesson plans, teacher notes, student worksheets and assessment tasks will be displayed. One of the new kits contains a digital microscope. Topics include: Needs of Living Things (Prep-Yr1); External Features (Yr 1 & 3); Invertebrate Life Cycles (Year 2 & 4); Adaptations (Yr 5); Light (Year 5); Effect of Environment on Organisms (Yr 6); and Classification (Year 7). **Requirements: Participants please bring a set of headphones to listen to videos** **Suitability: Primary School Teachers**	**25**
Associate Professor Michael Blumenstein **Dean, Research SEET Group** **Griffith University**	**Social networks and other Avatars: Challenges at the frontiers of Artificial Intelligence research** Crossing the 'technology pain barrier' - has computing and technology now become ubiquitous in our lives? If so, why are people cautious about learning more about the technology they use daily? How does the introduction of avatar-like social interaction on the internet enhance or detract from 'real' social interaction now and in the future? Artificial Intelligence to the rescue! - intelligent systems that are making a difference in our lives right now, and what the future holds in this area of cutting-edge research.	**Unlimited**

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	Suitability: All Participants	
Dr Suzzanne Owen **Health Development Coordinator** **Griffith University**	**Biology and Microscopy** Microbiology. Identifying the tissues using microscopy. Anatomical differences and scientific application of anatomy and physiology. Body basics through the eyepiece. **Suitability: Biology and Science Teachers**	**20**