Living luminaries of Australian chemistry:

Paul Fraser

Nanocrystals meet solar cells

RACI National Awards
GAP1: a vision to power our future

The venue for a truly unique international conference, held 14–18 August, was itself very special. Lord Howe Island is located in the South Pacific about 600 km east of Coffs Harbour. Several special flights had to be arranged to bring in an amazing range of the participants from mainland Australia, Asia, North America and Europe to this beautiful, World Heritage Listed venue. The island had not previously hosted a major conference. Nearly everyone on the island was engaged with it, one way or another.

GAP1, conceived and convened by Thomas Faunce, an ARC Future Fellow at ANU, was an official event of the UNESCO International Year of Chemistry as well as being financially supported by the federal DIISR and ANU and endorsed by the UNESCO.

The full title of the conference was ‘Towards Global Artificial Photosynthesis: Energy, Nanochemistry & Governance’, abbreviated to GAP1. The quality and spread of participants can be seen at law.anu.edu.au/coast/tgap/conf.htm. GAP2 is already being planned, potentially as a satellite meeting of the International Photosynthesis Congress in 2013.

The conference brought together a wide range of experts in the chemistry, physics, biochemistry and biology of converting light into electricity, heat and chemically storable energy. In addition, scholars presented important economic, governance, policy and legislative aspects of changing from fossil fuels to renewable energies. Additional to the 50 academic presenters, 46 years 11 and 12 science students from five schools (James Ruse (NSW), Geelong Grammar (Vic.), Radford (ACT), Canberra Grammar (ACT) and Narrabundah College (ACT)) also attended.

The days were long (starting at 8 am and ending at 10 pm); there were no parallel sessions and few posters. Each session was constructed to be a mix of topics, with all academic presenters being allotted 20 minutes. Talks in each session were followed by short presentations by the high school students!

These were often insightful, amazing and hilarious. Ending most evening sessions was a panel discussion about the future of global artificial photosynthesis. Participants had between 12.30 and 4 pm to walk about the island to enjoy the kentia palm forests, beaches, lagoon and some of Earth’s southern-most coral reefs and explore the exquisite microclimates on the slopes of the mountains on Lord Howe.

The phenomenally interdisciplinary nature of this ANU (College of Law) sponsored conference is very much in tune with the structure and purpose of the newly formed Energy Change Institute at ANU (energy.anu.edu.au). The Master of Energy Change degree initiated by the institute similarly encompasses many disciplines so as to provide graduates with a practical understanding of the many technical, economic, governance and policy aspects of energy change.

Quite naturally, many new contacts were made at the conference. The idea of bringing school students to such a meeting was applauded by all. It became more and more apparent that the idea of and necessity for artificial photosynthesis’ technologies needed to be promoted and explained from the ‘bottom up’ in society. Justice Michael Kirby in his presentation warned that there would be ‘powerful forces’ resisting any change from the status quo, as vast amounts money was invested in fossil fuel production and usage.

The high school students suggested that the badge ‘artificial’ in artificial photosynthesis was not helpful. ANU PhD student Jeremy Hall suggested the term ‘adaptive photosynthesis’ be used and this was widely accepted as the abbreviation, as the mnemonic AP would still apply.

Another remarkable aspect of GAP1 is that the proceedings will be published as a special ‘open source’ volume of the Australian Journal of Chemistry. Each participant has been invited to contribute to the volume, including the high school students.

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