ANFF

ACT Node & WA Node NEWS

Providing nano and microfabrication facilities for Australia's researchers

Australian National Fabrication Facility

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ACT Node Officially Opened

November 2, 2011 saw the official opening of the ANFF ACT Node - an event a long time in the planning, but well worth the wait. Professor Chennupati Jagadish (the Node Director) introduced the speakers including Dr Bob Frater (ANFFL Chairman and Board Member), Rosie Hicks (ANFFL CEO), Professor Lawrence Cram (ANU DVC) and, of course, Senator the Hon Kim Carr - Minister for Innovation, Industry, Science & Research (now ex-minister). Senator Carr addressed about 100 invitees made up of executive and staff from the host university (ANU), the University of Western Australia, CSIRO, industry clients, ANFFL Board members, the IAS, Department of Innovation, Industry, Science & Research and others.

Rosie Hicks (ANFFL CEO speaking at the ACT Node official opening.

"Already, researchers using this node have developed an innovative approach to making high-performance nanowire solar cell technology which will contribute to Australia's low carbon future," Senator Carr said.

"This will make solar cells more economically viable by increasing their energy conversion efficiency and reducing the cost of manufacturing by enabling larger scale production."

Senator Carr said the Australian Government had recognised the ANFF's importance by investing $91 million from the National Collaborative Research Infrastructure Strategy and the Education Investment Fund Super Science initiative.

Senator the Hon Kim Carr making a point about the level of investment and benefits to Australia of the ANFF initiative.

"This is a fine example of how important high quality research infrastructure is to Australia's innovation system. World-class research is the key to a thriving innovation system and world-class research requires world-class tools."

"ANFF research is helping to retain highly skilled Australian research scientists in Australia, benefiting not just the Australian economy, but the Australian community with their skills," Senator Carr said. Professor Jagadish and Professor Jim Williams (ANU RSPE Director) also spoke about the facility before inviting Senator Carr to unveil the plaque and conducting tours of the facility.

Senator Carr (left) with Professor Lawrence Cram, ANU Pro-Vice Chancellor (centre) unveiling the opening plaque with Professor Jagadish encouraging from the side. Image to the right shows close-up of the plaque.

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Another year is just about to close on us and everyone is busying themselves with end-of-year activities. And what a year it has been for both the ACT and WA Nodes.

This year both Nodes were 'officially' opened, even if we had been operational now for some time. The WA Node had their opening in March and the ACT Node was opened by Senator Kim Carr in early November - and this is the main story for this issue.

It was a terrific event attended by close to 100 people, finishing with an informal BBQ lunch which seem to go down well with all that attended. This event would not have been possible without the generous contributions of assistance from staff and students from the Department of Electronic Materials Engineering, the Research School of Physics & Engineering and the Vice Chancellors Office - the staff of the ACT Node thank you heartily for your efforts.

On a less happy note, the ACT Node saw the departure of our longest serving member of staff - Dr Xijun (Gordon) Li, our EBL Process Engineer. Gordon has returned to Singapore to take a tenured position at National University of Singapore. Ironically,

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ACT Node & WA Node info:

- The ACT Node specialises in III-V compound semi-conductors.
- The WA Node specialises in II-VI compound semi-conductors and MEMS.
- We can provide full support with the use of the equip-ment available.
- Full pricing policy and rates are available on the ANFF website at www.anff.org.au or contact us direct for more information - see contact details overleaf.

Quick Bites from the ACT Node

The ACT Node has extended the range of equipment funded via EIF or NCRIS to include the following small tools to supplement existing flagship equipment:

- Barrel etcher for resist stripping and optimised lithography through resist footage removal.
- Wire-bonder featuring ball-wedge and wedge-wedge bonding.
- Vacuum oven up to 400°C essentially for curing BCB and other organic polymers.
- Rapid Thermal Annealing (RTA) that will be delivered and installed in January 2012 allowing processes under various ambient (O_2, Ar, forming gas N_2/H_2) and up to 1400°C.
- Surface profiler to replace the current 20 year old system.
- Extending the PECVD tool to include a TEOS process for SiO_2. TEOS stands for Tetra-Ethyl Ortho-Silicate. This feature will be unique in Australia.

The Node is also investigating the purchase of an advanced Plasma-assisted Atomic Layer Deposition (PA-ALD) that covers oxides (Al_2O_3, SiO_2, TiO_2, ZnO), nitrides (TiN) and pure metals (Ag, Au). The latter is crucial for contacting nano-wires, a main research topic at EME/RSPE. Also a spectral ellipsometer is under consideration covering the range of 190-2100nm making it suitable for the upcoming MOCVD reactor for GaN and related materials. We have also continued to work on improving the range of processes/services offered to the research community:

- Optical lithography procedure was reviewed to improve sidewall roughness after etching SiOx mask and the semiconductor (GaAs and InP).
- Extended the range of sputter targets used in our system to cover now iron, copper and molybdenum.
- From August to October the Node hosted a trainee student, Mareen Gläske, from Berlin, Germany who worked on a top-down approach to create nano-pillars in GaAs-based hetero-structures. Interesting results were obtained and the work will be presented at ICONN to be held in Perth (5-9 February 2012).

Fouad Karouta, Facility Manager

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"These facilities will be used to develop the next generation of photonic chips for fast communication systems as well as developing high performance nanowire solar cells for Australia's low-carbon future," Professor Jagadish said. A number of the invited guests took the opportunity to take a guided tour of the facilities highlighting the flagship equipment and laboratory infrastructure the ANFF project had made possible.

Images left to right: Senator Carr inspecting the Focused Ion Beam (FIB) with Prof. Jagadish (right) and Prof. Cram (rear); Senator Carr and Jagadish at the Inductively Coupled Plasma machine (ICP); and enjoying a bite to eat and a jovial discussion at the lunch time barbeque.

An informal barbeque lunch was held after the tours (with generous assistance from both staff and students from RSPE and EME) providing a pleasant conclusion to the event with attendees from all sectors mingling and discussing the merits of this terrific initiative. And from all accounts a great time was had by all.

Additional press releases, articles and photo's can be found at these sites (photo's courtesy of Tim Wetherell, RSPE):

- http://minister.innovation.gov.au/Carr/MediaReleases/Pages/ACTRESEARCHFABRICATIONFACILITYHELPSDRIVEINNOVATION.aspx
- http://www.canberratimes.com.au/news/local/news/education/latest-technology-hub-of-activity-at-anu/2345467.aspx
- http://www.pacetoday.com.au/news/act-research-fabrication-facility-set-up-to-boost

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having been with us since the beginning of 2009, he missed out on our official opening! We wish Gordon and his family all the best with the new position.

We would also like to take this opportunity to thank all our facility users and wish you, and other recipients of this newsletter, all the very best for the Festive Season and New Year and look forward to continuing our relationship with you in 2012.

Here are some jokes for you to inflict on family, friends and colleagues at any upcoming events (credit - @DoctorKarl tweets):

- *A photon checks into a hotel and is asked if he needs any help with his luggage. "No thanks, I'm travelling light".*
- *Helium walks into a bar and orders a drink. The bartender says "sorry, but we don't serve noble gases here". Helium doesn't react.*
- *Two scientists walk into a bar. The first says "I'll have a glass of H_2O". The second says "I'll have a glass of H_2O too". Then he dies.*

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