Alumni in profile

Nancy-Bird Walton AO, OBE, Hon DSc., Hon MEng (1987) 1915-
Woman in flight

Pioneer aviatrix Nancy-Bird Walton became Australia’s youngest ever female commercial pilot at the age of 19. She was also the first female pilot in the Commonwealth to fly professionally.

On August 11, 1933, Nancy commenced her flying lessons, under the tutelage of Sir Charles Kingsford-Smith, in a De Havilland Gipsy Moth aeroplane. In her quest for engineering knowledge, she used to visit the hangar at Mascot and was given the job of cleaning the spark plugs with a wire brush dipped in raw petrol on Kingsford-Smith’s Southern Cross.

After she attained her commercial licence, Nancy Bird and co-pilot Peggy McKillop embarked on a tour of country shows, offering joy rides and barnstorming exhibition flights.

During this time Nancy Bird was asked by the Royal Far West Children’s Health Scheme to station herself at Bourke following the tragic death of a woman still 100 miles from any medical help by road. She was then able to fly a patient to a doctor or a doctor to a patient. Nancy Bird also flew its clinic sister every six weeks to isolated settlements in the remote Outback beyond Bourke.

During World War II, Nancy-Bird, now Walton following her marriage, was commandant of the Women’s Air Training Corps of Australia, which recruited and trained women to serve in the air force, if they were ever needed.

After the war, Nancy-Bird Walton founded the Australian Women Pilots’ Association. She wrote two autobiographies, one in 1961 “Born to Fly” and “My God! It’s a Woman” in 1990.

Nancy-Bird Walton was bestowed an Order of the British Empire in 1966, an honorary Masters of Engineering from The University of Sydney in 1987, and an Order of Australia in 1990.
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The Fish-Bird team – from left: Steve Scheding, Stefan Williams, David Rye and Mari Velonaki – from the core/art science collaboration in ACFR

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Dean’s Message

The Faculty has recently celebrated the 125th Anniversary of the first lecture by Professor William Henry Warren on 27th March 1983. This also coincided with the 25th Anniversary of the Warren Centre which was established at the time of the centenary of Warren’s first lecture. Mr Peter North, AM, launched the fundraising for the Warren Centre Chair of Engineering Innovation at the event. The Chair comes at a critical time in Australia as the Federal Government conducts an inquiry into Innovation in Australia.

The new Vice-Chancellor Dr Michael Spence from Oxford takes up his position officially on 14th July, 2008. However, he will be arriving at the University in mid-May and will visit the Faculty on 30th May to meet the Deans Advisory Committee (DAC), and the staff of the Faculty with a tour of laboratories. We look forward to working with Dr Spence in the years ahead to further advance the Faculty.

The Faculty was delighted to see it recently maintained its Shanghai Jiao Tong ranking in the range 51-75 in the world, one of only 2 in Australia along with the University of Melbourne. This ranking, which is strongly research based, shows the absolute quality of the research being performed in the Faculty as judged by truly international benchmarks.

The Faculty Executive including the Dean, Executive Assistant Kay Fielding, Faculty Secretary Annette Alexander, Executive Officer Mr Eric van Wijk, Finance Director Mr Dominic Curtin, Executive Director Engineering Sydney™, Mr Keiran Passmore, and Faculty HR Relationship Manager, Mr Paul Harvey, moved into new offices on Level 2 of the new School of IT building. This relocation will allow the whole executive team to work more closely to achieve the goals of the Faculty.

An Infrastructure Masterplan 2008-2013 is currently being prepared by the architectural consultants Woods Bagot. One key feature will be a new Integrated Learning Centre (ILC) to be located in space currently occupied by the Engineering Library on the ground floor of the PNR Building. The Engineering Library is to be included in the new Science and Technology library in the soon to be completed USyd Central building located adjacent to the Sydney University Union Wentworth Building on City Rd. The ILC will provide an open workspace for students to work in teams on project based learning.

Professor Gregory Hancock, Dean
This event celebrated two anniversaries: the first Engineering lecture delivered by Professor William Henry Warren on 27th March, 1883 at the University of Sydney; and second, the 25th anniversary of the founding of The Warren Centre.

Warren was appointed by the Senate to the position of Lecturer in Engineering on 6th December, 1882 and took up his appointment on 1st March, 1883. On 5th November, 1884 the Senate conferred the title of professor of title upon him. Further, on 29th July, 1889, the Senate resolved that Warren be offered the Challis Chair of Engineering.

To paraphrase Michael Gourlay’s book, Professor Warren was an active participant in scientific and engineering activities outside the environs of the University. He developed relationships with professional colleagues and this interaction with the engineering profession provided the impetus for developing his program on research on the properties of local construction materials. Warren’s approach and ideals have been maintained in the Faculty to the present day.

The event was well attended with approximately 350 people, comprising of alumni, staff, students and guests. Musical accompaniment was provided by Sydney Conservatorium graduates’ ensemble ‘Nic Jeffries Trio’.

The Warren Centre’s Mike Dureau and SUEBA President Nathan Byrne played host to the keynote speakers of the event: Mr Peter North, The Honourable Frank Sartor, Mr George Maltabarow and Mr John Grill – all esteemed alumni of our Faculty.

This successful event concluded with acknowledgement of speakers, staff and sponsors and musical treats from the Conservatorium trio.
Great Opportunities for Sydney Graduates

On Wednesday 2 April 2008, the Faculty of Engineering & Information Technologies held the Engineering Sydney™ Careers Fair at the Seymour Centre. Over 70 industry exhibitors were spread out over two floors of the Centre, all eager to speak to current students about graduate opportunities after study. Over 2,500 students made their way through the maze of exhibitors between 12pm and 3pm on the day. The event, now in its third year, is a tremendous opportunity to bring together representatives from the engineering and IT industries and current students looking for graduate employment. More photos of the event can be found at www.flickr.com/photos/engitsydney.

For more information on this event, please visit the Engineering Sydney™ website at www.eng.usyd.edu.au/engineeringsydney.
Interview with Amrita Singh
– Graduate on the move to Harvard

Why study engineering?
I studied engineering because it is a discipline that teaches you to solve problems and think outside the square. It extends your mind so that you can develop new, innovative ideas. I knew that with an engineering degree I would have flexibility in my career choice when I finished my degree. This is because the skills one learns from an engineering degree are invaluable whether one stays in the field of engineering or not.

Did you always know you wanted to study engineering?
I always knew I wanted to study a medical based degree. However, I wanted to work in the corporate world. When I was applying to university I realised that a Biomedical Engineering degree would suit me perfectly because it merged the two areas together. I was unsure what career choice I wanted to make when I completed my degree, however I was aware that the problem solving skills I would develop from an engineering degree would be valuable in any career path I chose.

What have you been doing since graduation?
I currently work for Ventracor as a Biomedical Engineer in Advanced Product Development. Ventracor is global medical device company which produces an implantable blood pump, the VentrAssist left ventricular assist device (LVAD), as therapy to improve the lives of heart failure patients and their families. The Advanced Product Development team is an exciting team to work for as we focus on new research and development to create future changes to the LVAD system at a 5 year outlook. I work on the mechanical design of the new system.

Why further study?
I have worked in two engineering companies (Cochlear and Ventracor), and have prior work experience in finance industry (Fiducian Portfolio Services). This background made me interested in the overall picture of how things were run, including the intricate relationships between management and engineering, and what is necessary not only to develop a great idea into a product, but how to make that product successful through effective strategies and company operations. This interest gave me reason to apply for an MBA.

Why Harvard?
I want to study in America because the reputation of its MBA courses is the highest in the world. With my engineering background, Harvard is of particular interest due to the support for students in the healthcare industry. Harvard has an MBA healthcare club and around 100 students from the MBA program pursue careers across various segments of the healthcare industry on completion of their degree. Furthermore, Harvard Business School focuses on networking rather than only theory. They have a reputation of focusing on the building of connections with others to create work relationships that will last a lifetime.

What are your plans for Harvard?
My plans are to make the most of the environment I will be in. I will use my time to meet as many people as possible and really ground myself in areas of academia as well as extra curricular so that I create as many opportunities for myself as possible.

What was the application process like?
The application process was extremely time-consuming. I began studying in May 2007 for the entrance exam. I was studying weekends, after work and during lunch breaks until I sat the exam in September 2007. It is hard to stay motivated because all study is self study from textbooks and the exam deadline is created by yourself. Furthermore it is a 4 hour exam on which a lot of your marks are dependant on your mind stamina and ability to concentrate and think quickly. For the application submission I had to write several essays. Harvard then reviewed the application and offered an interview. The interview was an amazing experience. I had a really interesting conversation about the world in terms of politics and the environment. Two months later I got a phone call of admission.

When are you going?
September 2008.

What does the future hold after Harvard?
I find it hard to answer this question. I want to continue to work in the field of Biomedical Engineering. I expect that the outlook of my career will be extremely different when I finish up my MBA, however I will always have a commitment to working in a segment of the healthcare industry.

What would you say to young people who are thinking about studying engineering?
Engineering in the workforce, or as a degree, is a discipline that teaches you how to think critically and how to solve problems. Whether you stick with engineering or move away from it, these are qualities that can help you in any profession you enter.
Where did you come from before you came to the University of Sydney?
I grew up in Christchurch, New Zealand, and I have studied both in New Zealand and at the University of Oxford in the United Kingdom, working both in New Zealand and the United Kingdom.

What is your academic background?
B.E. (First Class Hons), Chemical and Process Engineering, University of Canterbury, Christchurch, New Zealand, and John Blackett Prize in Engineering, 1985.
D.Phil. (Engineering Science), Balliol College, The University of Oxford, 1989

What are your current research interests?
Drying technology, spray drying and timber drying, solar kilns and particle technology.

What are the major challenges in your research area?
Developing new engineered particles to deliver higher quality nutritional foods.
Designing and operating new solar kilns for better timber quality and energy efficiency.

How will you meet these challenges?
Collaborative research with industry is a key approach. For example, based on new understanding that we have developed regarding how to control the degree of crystallinity in spray-dried materials, new industrial applications have been developed. In particular, we have developed techniques based on control of the operating conditions to partially crystallize materials, thereby enabling foodstuffs to be successfully spray dried that could not previously processed into powders, such as a new bioactive extract from hibiscus flowers that is rich in polyphenolic antioxidants like anthocyanins. This powder product has been produced in association with an ARC Linkage industry partner, Tim Lang of Lang Technologies P/L.

What are your ambitions for the school?
I see the need to build critical mass overall, both in terms of quality and quantity, so that we can contribute meaningfully to meeting the opportunities ahead.

What are some of the opportunities for your school?
Chemical and Biomolecular Engineering is ideally placed at the interfaces between applied and fundamental science and engineering to provide solutions to new and sustainable process energy developments, as well as to a wide range of related areas in chemical, physical and biological systems. These systems include areas of bioengineering, nanotechnology, fundamental chemistry, environmental systems, particles, minerals and smart fluids.
Welcome to Dr. Jannette Frandsen
Senior Lecturer in Civil Engineering

Jannette Frandsen received her B.Sc. from the Technical University of Denmark, M.Sc. from Imperial College London and the doctorate at Cambridge. She was appointed a Departmental Lectureship at Oxford and concurrently held a Fellowship at Oriel College. She has also taught and undertaken research in USA. She was awarded the US National Science Foundation Career Award in 2004. She currently serves as a senior lecturer at School of Civil Engineering, The University of Sydney. Her teaching and research interests are in the areas of fluid dynamics, nonlinear free-surface water waves and fluid-structure interactions.

The common theme of Dr. Frandsen’s research includes investigations of free-surface gravity water waves and bluff-body boundary layer physics. Combining fluid dynamics and elasticity is one goal of the research but the understanding and the predictions of the fluid dynamics itself tend to represent the main challenges. The treatment and behaviour of high Reynolds and Froude numbers flows are the primary question to address.

Dr. Frandsen has taught and concentrated on classes in the field of structural analysis, fluid dynamics, structural dynamics, fluid-structure interactions, numerical analysis, partial differential equations, and nonlinear fluids phenomena.

Underpinning her academic experience, Dr. Frandsen spent several years working in industry. She joined Hoejgaard and Schultz (1988) working part-time on structural mechanics problem. She was appointed a full-time job at Kvaerner Earl & Wright (1991) where she got involved with conceptual and detailed analysis/design of fixed and floating offshore platforms. Hereafter, she worked for Tarmac Black and Veatch and Dar-Al-Handasah (U.K.) where she undertook analysis and design of bridges, harbour and military structures. She has also worked on joint venture projects in Norway, Singapore and Australia including offshore projects at Hardcastle Richards Earl & Right, Kvaerner R. J. Brown and Kvaerner Oil & Gas.

The research program of Dr Frandsen should attract students with interests in fluids, vibrations and/or the behaviour of large structures, Areas of special interest are ocean waves, wind-waves, coastal processes and flow-induced vibrations. Research investigations are undertaking with both a computational, theoretical and experimental approaches.

Welcome to Dr. Gwénaëlle Proust
Lecturer in Civil Engineering

Where did you come from before you came to the University of Sydney?
I was doing a post-doc at Los Alamos National Laboratory in the Materials Science and Technology division at Los Alamos, New Mexico, USA.

What are your current research interests?
My work consists in understanding and modelling the mechanical behaviour of polycrystalline metals. The main component of this research is to link the microstructural aspects of metals to their mechanical properties. The first step is to understand how microstructure evolves during deformation and, in that purpose, I study deformed specimens using material characterisation techniques such as optical microscopy, scanning electron microscopy and electron backscattered diffraction. The information collected during the experimental phase is then incorporated in crystal plasticity models that can predict the behaviour of metals during usage or that can also help developing new processing routes.

What are the big challenges in your research area?
The materials I have selected to study - zirconium, titanium, and magnesium alloys - display unusual mechanical behaviours. In order to predict and reproduce these particular behaviours, one needs to build a basic understanding of the interactions between microstructural features present in the material.

How will you meet these challenges?
I intend to start a thorough study of these interactions at different scales to build a basic knowledge of the role of the different microstructural features and their interactions.

The final goal is to incorporate these interactions in the constitutive model describing the mechanical behaviour of these materials.

Do you have any advice to offer students and alumni in your discipline?
A lot is still to be done in the basic understanding of the mechanical behaviour of metals. This knowledge is fundamental to improve the ways materials are processed and to determine new application for them.
Bonds strengthen between Faculty and Chinese Universities

A delegation from our Faculty visited China in April to meet with their counterparts at various universities. We ask Dr Liaquat Hossain and Eric van Wijk for their perspectives on the trip.

What was the mission of the trip?
We have a long standing research and student exchange relationship at the undergraduate and postgraduate level with Shanghai Jiao Tong University, Harbin Institute of Technology, Dalian University of Technology and Harbin Engineering University. The Faculty of Engineering and IT at the University of Sydney currently have joint PhD supervision and research links with these universities in China. We also have students coming from these Universities to undertake the final 2 years of Bachelor of Engineering at the University of Sydney and are extending these arrangements to include the IT degrees.

We are now forging links with these Chinese universities for attracting students into our Master of Engineering, Master of Information Technology, Master of Information Technology Management and MPhil/PhD programs.

Our visit accompanied by the Dean and other senior executives was very timely and strategic to show our commitment in developing and sustaining these exchanges. We are able to discuss strategies for attracting high quality students into our graduate programs through the China Scholarship Council scheme.

What did the group do when they were there?
We were hosted by the Vice Chancellor, Deputy Vice Chancellor, and Deans of different faculties of these universities. We had focused discussions with different schools (i.e., Civil, Chemical, EIE, and AeroMech and Computer Science, IT and Software) of the engineering faculty of Shanghai Jiao Tong University, Harbin Institute of Technology, Dalian University of Technology and Harbin Engineering University.

The Dean, Professor Gregory Hancock, gave formal presentations highlighting the teaching and research strengths of our Faculty to the senior executives and students of these institutions. We discussed possible Memorandums of Understanding with the Faculty of Engineering and IT of the University of Sydney in relation to transfer of students, joint research and PhD supervision through the China Scholarship Council scheme and possible academics staff exchanges with these institutions in China.

What successes did the faculty delegation achieve?
We were able to reach an informal agreement with regards to joint PhD supervision through China Scholarships program, transfer of undergraduate students for our Bachelor of Engineering and the postgraduate coursework program. We also received very good feedback and interest from prospective students with regards to our Master of Professional Engineering degree program which would be offered by our Faculty for 2009.

The connections with the Harbin and Dalian universities go back 6 years and we continue to strengthen the ties. It is important for the Faculty to maintain its connections with China and this visit was to cement the ongoing relationships.

Left to Right: Professor Liyong Tong, Professor Greg Hancock, Professor Kim Rasmussen, Associate Professor Fariba Dehghani, Eric van Wijk, Dr Liaquat Hossain, Associate Professor Sanjay Chawla.

Professor Greg Hancock, Dean of Faculty and Professor Guang Meng – Dean, School of Mechanical Engineering, Shanghai Jiao Tong University.
Honours and Awards
Governor General Congratulates 3rd year Biomedical Engineering Student

The Governor-General of the Commonwealth of Australia Michael Jeffery presented third Year University of Sydney Biomedical Engineering student Amelia Parker, with an Order of Australia Association Foundation Scholarship at Parliament House on 16 February 2008.

One of four awardees from universities around Australia, Amelia will receive a scholarship of $40,000 to help cover the costs of tuition fees, living allowance, textbooks and equipment. In addition, Amelia will enjoy a personal mentoring relationship with a member of the Association for her remaining three years of study.

Amelia is studying the double degree of Engineering (Biomedical) and Science (Biochemistry) and in her two years she has achieved outstanding results and has been invited to join advanced programs in both degrees. She aims to work within the biomedical industry in Australia in research or engineering – tissue engineering is a growing interest for her future contribution to Australia. Funding for Amelia’s scholarship was generously donated by the Cochlear Foundation.

Did you know?
• Our first year cohort is 20 per cent female. This compares favourably with other Group of Eight universities that have an average of 14 per cent. The median mark for the first year cohort was 92.8 UAI. Our first year students show great potential for excellence.
• Our Faculty has strong links with industry and the profession. More than 160 companies are involved with the Faculty through:
  • Work experience placements
  • Support for scholarships and endowment of prizes
  • Sponsored professorships
• Research and foundations
• Industry-sponsored projects

Visit www.eng.usyd.edu.au/engineeringsydney for more information on our links with industry and information on our summer vacation placements.
Honours and Awards
Robert Minasian receives distinguished Fellowship

Professor Robert Minasian, Head of the School of Electrical and Information Engineering, has been elected as a Fellow of the Optical Society of America (OSA) by the Board of Directors. OSA is widely recognised as the leading professional society for the generation, application and archiving of knowledge in the area of optics and photonics.

The honour of Fellowship to OSA is limited to ten percent of its membership and is reserved for members who have contributed to the discipline of optics and photonics with distinction. Fellows include several Nobel Laureates. Professor Minasian was honoured with the award due to his contribution to the fundamental understanding of photonic signal processing of microwave signals.

The Faculty congratulates Robert on this prestigious award and wishes him continued success in his field of research.
Deans Advisory Committee

- Professor Gregory Hancock AM: Dean
- Professor John Small: Pro Dean
- Professor Assaad Masri: Associate Dean Research and Research Training
- Professor Liyong Tong: Associate Dean International
- Dr Liaquat Hossain: Associate Dean Postgraduate Coursework
- Dr Doug Auld: Associate Dean Undergraduate
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- Associate Professor David Airey: Associate Dean Learning and Teaching
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- Professor Simon Fleming: Director Optical Fibre Technology Centre
- Keiran Passmore: Director, Engineering Sydney™
- Eric van Wijk: Faculty Executive Officer
- Dominic Curtin: Finance Director
- Paul Harvey: HR Manager
- Annette Alexander: Faculty Secretary

Presidents and Executive Officers of Foundations and the Warren Centre

- Professor Michael Dureau: Chairman and Executive Director of the Warren Centre for Advanced Engineering
- Alex Dronoff: President Chemical and Biomolecular Engineering Foundation
- Skender Bregu: Executive Officer Chemical and Biomolecular Engineering Foundation
- Peter Thornton: President Civil Engineering Foundation
- George Maltabarow: President Electrical and Information Engineering Foundation
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Student and Alumni Organisation

- John Doherty: President Engineering Sydney Alumni Association
- Nathan Byrne: SUEUA President