SCHOOL OF PHYSICS REACHING PHYSICS ALUMNI

From the Head of School

THE Concise Oxford Dictionary defines alumni to be 'former pupils or students of a particular *school*, college or university'. Since the Department of Physics became the School of Physics with effect 1st January 2003, it therefore seems appropriate to address this inaugural newsletter to the 'alumni of the School of Physics'. We feel it is important to include former staff in this definition. The recent University restructure saw some Departments amalgamated with others into a single School, and so Physics is proud to have retained its identity. The School of Physics sits in the new Faculty of Life and Physical Sciences.

To place the School of Physics briefly into current context, we continue to be a research focused School, but with a strong commitment to quality teaching at both undergraduate and postgraduate levels. The School supports 12 academic staff, 17 technical and administrative staff and 19 research funded staff. The School has extensive workshop facilities in which much of the major research equipment for the experimental groups is machined by our highly qualified technical staff. The major research groups include Atomic, Molecular and Surface Physics (CAMSP); Biomagnetism; Computational Physics; Frequency Standards and Metrology (Microwave and Optical divisions); Interferometric Gravitational Wave Detection (AIGO); Nanomagnetics and Spin Dynamics; and Theoretical Physics (Condensed Matter Theory, Quantum Dynamics and Supersymmetric Quantum Field Theory). I hope to introduce these groups to you in greater detail in coming issues of the newsletter

I expect that for most of us, our years as undergraduates were some of the most important in our lives. ***University offers challenges and freedoms, both intellectual and social, which are rare in any other environment. Our response to these shaped our futures.***

I am a graduate from UWA. I certainly found my Physics major prepared me very well for my future career, which happened to be in research in theoretical physics. However, even if I had not chosen to pursue a career in Physics, I believe that the skills in problem solving, quantitative analysis and critical thinking which I developed by undertaking a Physics major could have taken me in many different directions. I certainly hope that this has been the experience of alumni. It is quite interesting to reflect on the fact that Physics graduates are currently in demand from leading international financial institutions, not for their knowledge of quantum mechanics or astrophysics, but for the types of skills I mentioned above.

We have decided to start an alumni newsletter in the hope that many of you still retain fond memories of your time in Physics at UWA, and have an interest in how the Department (School) is faring. Although this initial offering is rather modest, we hope to develop an expanded format in time. I would be particularly interested in any feedback on the type of information you would like to see in the newsletter. I also encourage you to send us news and information that you would like to share with others through this newsletter.

Dr Ian McArthur

Summing up 2002

The year 2002 was very eventful for Physics. We take this opportunity to reflect on the highlights of 2002. Although not all the names mentioned below will be known to everyone, we hope to introduce research groups and individuals in future newsletters.

■ In **JANUARY-FEBRUARY,** Dr Nick Warrington and Dr Andy Mikosza became Honorary Research Fellows. Professor Jim Williams accepted an invitation to join the National Scientific Advisory Committee for the Australian Synchrotron Facility. Mike Tobar was promoted to Associate Professor, and presented an invited talk in NSW on Microwave Frequency Standards. Bob Stamps presented a four day short course on magnetic excitations in nanostructures at NIST in Boulder, USA. On the student front, Natalia Bugayeva, Peter Falloon and James Anstie took up APA PhD Scholarships and Javier Torrealba received an APA Industry PhD scholarship. On the personal front Eric May and Jane became engaged, Greg Black and Sylvia had their first child on 02/02/02, as did Andre Luiten and (another!) Sylvia.

■ In **MARCH,** Rob Woodward and Clayton Locke had their PhD theses passed and Peter Falloon passed his MSc with distinction. Ken Field joined the Gravity Waves Group as a senior technician and Beau Pontre commenced his PhD with Tim St Pierre. The State Minister for Education, Alan Carpenter, presented a cheque for $60,000 to the Gravity Discovery Centre.

■ In **APRIL** Beau Pontre won the Maslen Physics Prize for 2001. John Jacob joined the Gravity Waves team as a Senior Research Fellow. Dr Linda Harris from the Virginia Polytechnic Institute and State University was awarded an NSF International Research Fellowship to work for 18 months at UWA with Tim St Pierre in the Biomagnetics Group.

Professor Denis Greig from the University of Leeds visited Bob Stamps' group with support from a fellowship awarded by the Royal Society. He presented a lecture course on Surface Physics to the Honours students. Bob Stamps gave an invited talk at a special symposium at Intermag in Amsterdam, and also at the workshop PROMOX in Versailles. In April-May Sergei Kuzenko pursued research at the Albert Einstein Institute in Germany under the sponsorship of the Humboldt Foundation.

■ In **MAY,** third year physics student Ranga Muhandiramge was selected to attend the Particle Physics and Astronomy International Undergraduate Summer School at the University of Cambridge. The School has 12 international and 12 British invited participants. This was the second year in a row a third year student from the School of Physics was selected as the sole Australian participant (Dane Lance was selected in 2001). Eugene

ABOVE: Ranga and Dane attended a six week Particle Physics and Astronomy International Undergraduate Summer School at the University of Cambridge

Ivanov attended the IEEE Frequency Control Symposium followed by two months working in the Optical Frequency Measurement Laboratory at NIST in Colorado. He also attended the prize-giving ceremony to receive the Cady Award, an international prize recognizing his contributions to the development at UWA of the best low noise microwave oscillators in the world. John Winterflood received his PhD with distinction!

Mike Tobar visited France to collaborate on a new experiment to test special relativity and to conduct preliminary work for UWA involvement in the Atomic Clock Ensemble in Space mission. David Blair was invited to present a paper at the First Virgo-Sigrav School on Gravitational Waves in Pisa, Italy. Paul Abbott was busy writing/editing a book on Chaos, Fractals, and Dynamical Systems with two Spanish colleagues. Paul was also a member of one of the winning teams in the "100-digit challenge" (and the only winner from an Australian University). Tim St Pierre and Joan Connolly presented papers at the 4th International Conference on Scientific and Clinical applications of Magnetic Carriers in Florida. Tim also was invited to give a series of special lectures on the Physics of magnetic carriers during the conference. Peter Hammond was awarded beam time with his French

collaborators at Elettra, a synchrotron in Trieste, to examine highly excited states in atoms.

■ In **JUNE,** PhD student Eric May and 2001 Honours graduate Katie Humphry were successful in obtaining fellowships under a new scheme introduced by the American Australian Society. Out of five Fellowships awarded Australia-wide (with a total value of $200,000), two were won by students from Physics at UWA! Eric will take up his fellowship as a postdoctoral fellow at NIST in Maryland, while Katie will use it to do her PhD at Harvard.

Three international visitors from Romania, France and Japan arrived in the Gravity Wave Group, with their visits ranging from three months to one year. Clayton Locke headed off to the Conference on Precision Electromagnetic Measurements in Ottawa, funded by a Young Scientist Award. Andre Luiten, Mike Tobar and Clayton Locke made headlines in UWA News as the "Young Guns" of science. Bob Stamps was awarded funding by Seagate Technologies for a three year project involving theoretical studies in the field of magnetic nanostructures.

■ In **JULY** the Gravity Discovery Centre Foundation Stone was laid at the Gingin site of the Australian Interferometric Gravitational Wave Observatory (AIGO) by the Federal Minister for Education, Dr Brendan Nelson. The WA Governor also toured the AIGO site. A big month for the gravity waves group culminated with the laying of the AIGO Research Building Foundation Stone by the Federal Minister for Science, Peter McGauren. July also brought immense sorrow to the School when Allan Gorham, a respected colleague, passed away on the 12th.

BELOW: Federal Minister for Education, Dr Brendan Nelson with Professor David Blair at the Foundation Stone laying ceremony of the Australian Interferometric Gravitational Wave Observatory (AIGO) at Gingin site

■ In **AUGUST-SEPTEMBER** Peter Hammond was invited to deliver a talk at an International Seminar held at Kyoto University. Bob Stamps was promoted as Associate Professor, and was awarded funds under the ARC Linkage International Scheme for a collaborative research project in the area of 'spintronics' with a theoretical group in France. Honours student David Murray won a Student Membership to AusBiotech. Tim St Pierre was also promoted as Associate Professor. He and the Biomagnetics team, including Paul Clark, Beau Pontre, Adam Fleming and Wanida Chua-anusorn, won a Collaborative Research Initiative Grant from the Wellcome trust to work with Mahidol University in Thailand on iron overload disease.

■ In **OCTOBER,** the biggest ARC (Australian Research Council) Discovery Grant in Australia, worth $1.85 million over five years, was to the Frequency Standards and Metrology team comprising Andre Luiten, Mike Tobar and Eugene Ivanov. The grant is to develop precision optical and microwave technologies. Andre Luiten was also joint recipient of the inaugural Premier's Prize for Early Career Achievement in Science. The prize recognises excellence in scientific research achieved by a science researcher under the age of 35. Jingbo Wang was promoted to Associate Professor. Tim St Pierre and Linda Harris made headlines in UWA News for their collaborative research with groups in USA on drug therapies of the future involving magnetic nanoparticles.

■ In **NOVEMBER** Physics won 10 UWA Research Grants out of the 26 grants awarded in the fields of Maths, Sciences and Engineering. The winners were David Crew, Ju Li, Sergei Kuzenko, Clayton Locke, Sergei Samarin, Jingbo Wang, Jim Williams, John Winterflood, Rob Woodward and Yu Dehong.

■ In **DECEMBER,** our School Manager, Dr Renu Sharma, joined the School. The appointment of School Managers was one of the major initiatives in the restructure of the University in 2002. The year concluded on a very positive note with a fantastic Christmas party at Greco's, where a number of physicists displayed their musical talents.

■ **TO SUM UP,** in 2002 the School of Physics won research grants and contracts worth $3.43 million in ARC, NHMRC, and UWA research grants, and private industry and overseas funded research projects and contracts. In 2002 the School had a total of 501 students enrolled in first year Physics courses, 14 Honours Students, 29 Physics PhD Scholars and 5 Biophysics PhD Scholars. More than 60 papers were published by academics in international journals. Collaborations were forged with industry in Australia which should see practical benefits arising from research conducted in the School.

First Quarter of 2003

2003 has started very well for the School. Professor David Blair was awarded a 2003 Clunies Ross National Science and Technology Award for his quest to detect gravity waves – the so called 'drums of heaven'. The award was presented at a special dinner in Melbourne. He is the fourth academic from UWA to win this award since its inception in 1991. Tim St Pierre's spinoff company Inner Vision Biometrics (IVB) was on a national shortlist of ten for the Inaugural Peter Doherty Innovation Prize of $100,000.

ABOVE: Professor Tim StPierre with his prize winning research group

Physics was very well represented at the graduation ceremony for the Faculty of Life and Physical Sciences on 20th March. Receiving their PhD's were Joan Connolly, John McFerran, Philip Nakashima and John Winterflood. At the same ceremony, Professor Jim Williams was awarded a DSc – his second, the first being from ANU – and Ian McArthur was presented with the 2002 Excellence in Teaching Award for the Faculty, also his second.

Physics did very well again in the student feedback on the Siemens Science Experience for Year 10 students in the period 14-16 January 2003. There were 185 participants from 72 schools. On a rating scale with 1=excellent, 5=poor, the Physics "hands-on" activities rated 1.32, which was the top rating for activities put on by Schools.

We welcome our new PhD students Kia Manouchehri (Quantum dynamics Theory Group within CAMSP), Rebecca Fuller (Nanomagnetics and Spin Dynamics), Eu-Jeen Chin, Jerome Degallaix, Benjamin Lee, Kah Tho Lee, Sascha Schediwy and Jean Charles Dumas (Gravity Waves), Paul Stanwix (FSM-Microwaves), Anthony Sergeant (Centre for Atomic, Molecular and Surface Physics) and Xiuting Chan (Gravity Waves–PhD Prelim). Rebecca Fuller's PhD is partially supported by Seagate Industries.

Welcome also to Daniel Stone, our new Apprentice, who will be learning from the expert team in the Physics Workshop.

ABOVE: Gary Light, Lance Maschmedt and John Budge invite you to share your stories with us.

International Visitors

In the first quarter of 2003 more than ten physicists from eight different countries including Chile, Israel, Poland, UK, USA, China, Romania and Russia, visited the School of Physics for collaborations with the Theory, Gravity, SPIN and Magnetics groups.

Physics Alumni are invited to email articles to admin@physics.uwa.edu.au for this Newsletter. Please visit the School website http://www.physics.uwa.edu.au/ for a list of Physics Alumni and email us any missing names and addresses.

Ian McArthur