2012 has been another successful year for the Physics Education Centre (PEC). Student numbers in physics have grown steadily over the last five years, and a training in physics continues to be relevant to modern society not only as a discipline in its own right, but also as an enabling science for students whose major interest lies in other areas. ANU and RSPE are unique in Australia in their ability to provide a research led education to an undergraduate student population. In 2012, we continued to expand our undergraduate research project offerings and expanded the involvement of research staff in the research led teaching enterprise.

The most significant change to the management of PEC in 2012 was in its leadership. After many years of dedicated contribution to physics education at the ANU, A/Prof Anna Wilson resigned as leader of the PEC to take up a new position at the University of Oxford. Her expertise in physics education, and her detailed knowledge of how the PEC operates within RSPE and within the ANU are a role model for future leaders of the organisation. We wish her all the best in this new phase of her career.

A very substantial number of RSPE staff are involved and active in the PEC in diverse roles. Undergraduate lecturers are drawn from all departments in RSPE. These staff exhibited tremendous dedication in bringing their expertise to the undergraduate population through lectures, through lab sessions and through special research topics. Lecturing staff were supported by a large number of graduate student demonstrators who ran tutorials, laboratory sessions and provided help with assignments to our undergraduate cohort. Although too numerous to list here, the contribution made by our student demonstrators and tutors is highly valued by the PEC. In addition to lecturing staff, the honours program is supported by honours supervisors and examiners, and we thank those staff involved in that program.

Departmental education coordinators continue to play an important role in the PEC providing information to staff in their local areas and driving the research/teaching culture in the School. The complete list of 2012 education coordinators is provided at the end of this report. Their service in this important role is much appreciated. Similarly, the year convenors play an important role in coordinating courses within each year. Again their service is much appreciated by staff and students in PEC.

In the last years, our first year numbers have grown markedly. First year is the only year that has streamed courses. The strong demand highlights the continued relevance of physics as a discipline in its own right and as an enabling discipline for other fields. The growing numbers in our Foundations Course, our main-stream first year physics courses and our Life Physics course put increased demand on our technical support staff.

ANU and RSPE are complex organisations and expert administrative staff are essential to the smooth running of the organisation. Our administrative staff play key-roles in the Department. Our administrative staff fielded a myriad of questions from both students and staff during the year, and their contribution to ANU and RSPE is an essential part of our success.

2012 has been a very successful year with increasing student numbers and increasing involvement of staff across the School in the research led teaching enterprise that is at the core of the PEC’s mission. We thank all those involved in making 2012 a success, and we look forward to 2013.
Physics Education Centre Lecturers

**Undergraduate Coursework**

- PHYS 1001 Foundations of Physics  
  Nick Robins, A. Shavlov, John Debs
- PHYS1101 Advanced Physics I  
  Craig Savage, Paul Francis
- PHYS1004 Life Physics  
  Adrian Sheppard, Jodie Bradby
- PHYS1201 Advanced Physics II  
  Craig Savage, Paul Francis, John Love
- PHYS2013 Quantum Mechanics  
  Anna Wilson, Andrew Truscott
- PHYS2020 Thermal Physics  
  Frank Mills, Vladimir Mangazeev, Rachel Salmeron, Anna Wilson
- PHYS2016 Electricity and Magnetism  
  John Close, Cormac Corr, Igor Ivanov
- PHYS2017 Waves and Optics  
  Ben Buchler, Jong Chow
- PHYS3001 Advanced Theoretical I  
  Joe Hope, Andre Carvalho
- PHYS3033 Nuclear Physics  
  Greg Lane, Cedric Simenel, Maurits Evers
- PHYS3034 Fluid Mechanics  
  Ross Kerr, Andy Hogg, Ross Griffiths, Graham Hughes (RSES)
- PHYS3057 Optical Physics  
  Dan Shaddock, Dragomir Neshev, Vincent Daria
- PHYS3060 Fibre Optic Communication Systems  
  John Love and Jong Chow
- PHYS3041/3044/5 Special Research Topics  
  Joe Hope
- PHYS3002 Advanced Theoretical II  
  Susan Scott, Michael Hush
- PHYS3031 Atomic Physics  
  Matt Sellars, Steve Gibson
- PHYS3032 Condensed Matter Physics  
  Patrick Kluth, David Williams, Jenny Wong-Leung
- PHYS3051/ENGN4613: Microphotronics, Biophotonics and Nanophotonics  
  John Love

**Honours Coursework**

- Science Communication: Hans Bachor 
- Electromagnetism: Mathew Hole 
- Quantum Mechanics: Joseph Hope 
- Classical Mechanics: David Williams 
- Statistical Mechanics: Edie Sevick (Chemistry) 
- Scattering Physics: Steve Buckman and Mahananda Dasgupta 
- Quantum Measurement: Mathew James (CECS) 
- Nonlinear Physics: Dragomir Neshev, Andrey Sukhotoyuk 
- Non-equilibrium Statistical Mechanics: Denis Evans (Chemistry) 
- Relativistic Electricity and Magnetism: Ron Burman (UWA) with Nick Robins 
- General Relativity: Susan Scott 
- Surface Physics: Maarten Vos 
- Car Physics: David Williams

**Graduate coursework**

**Master of Photonics Courses**

- PHYS6500 Optical Physics  
  Daniel Shaddock, Dragomir Neshev
- PHYS6501 Fibre Optic Communication Systems  
  John Love
- PHYS6502 Microphotronics, Biophotonics & Nanophotonics

**Research School of Physics and Engineering**
Staff who contributed to teaching

John Love

PHYS6503 Work Experience in Photonics
John Love

PHYS6504 Semiconductors
Andrew Blakers

PHYS8505 Research Project
John Love

Master of Engineering Courses

ENGN6512 Optical Physics
Daniel Shaddock, Dragomir Neshev

ENGN6513 Fibre Optic Communication Systems
John Love

ENGN6613 Microphotronics, Biophotonics & Nanophotonics
John Love

ENGN6625 Power Electronics
Boyd Blackwell

Master of Nuclear Science Courses

PHYS8201 Nuclear Fundamentals
Andrew Stuchbery

PHYS8202 Reactor Science
Andrew Stuchbery, Tony Irwin

PHYS8203 Accelerator Science
Andrew Stuchbery

PHYS8204 Nuclear Radiation
Greg Lane

PHYS8205 Nuclear Fuel Cycle
Andrew Stuchbery

PHYS8206 Nuclear Measurement Methods
Greg Lane

Undergraduate Year Coordinators

Paul Francis (1st year)
Anna Wilson (2nd year)
Joseph Hope (3rd year) and Special Topics Coordinator
Jodie Bradby PhD convenor
David Williams (Honours)

Departmental Education Coordinators
Joseph Hope: Department of Quantum Science
Matt Sellars: Laser Physics
Cormac Corr: Plasma Physics
Adrian Sheppard: Applied Mathematics
Patrick Kluth: Electronic Materials Engineering
Andrew Stuchbery: Nuclear Physics
Elena Ostrovskaya: Nonlinear Physics
Stephen Gibson: Atomic and Molecular Physics Laboratories
Vladimir Mangazeev: Theoretical Physics

Professional Staff

Departmental Administrator
Laura Walmsley

Assistant Departmental Administrator
Gaye Cane

HDR student support (JAG)
Karen Nulty
Liudmila Mangos

Technical Staff

Head Technical Officer
Andrew Papworth

Laboratory Development Officer
Mika Kohonen

Technical Officer (Electronics)
Shane Grieves

Laboratory Coordinators
First year: Mika Kohonen
Second year: Ben Buchler, Anna Wilson