

**University of New South Wales
School of Physics
Staff 2007**

Professors

Michael Ashley

Astronomical instrumentation; astronomy in Antarctica; optical transients from gamma ray bursts; wide-field photometric surveys.

Seán Cadogan

Magnetism and hyperfine interactions in metallic compounds; Amorphous metallic alloys; Mossbauer Spectroscopy, neutron scattering, muon spin relaxation.

Robert Clark

Experimental investigation of quantum physics in low dimensional semiconductors and semiconductor nanostructures and their application to the next generation of electronics and computing.

Paul Curmi

Structure and dynamics of biological macromolecules; x-ray crystallographic studies of protein structure; molecular dynamics simulations; protein folding and stability, understanding the function of enzymes at atomic level.

Victor Flambaum

Theoretical Physics: Publications in atomic, nuclear, elementary particle, solid state, astrophysics, quantum chaos and statistical theory.

Michael Gal

Experimental Condensed Matter Physics: the study of the optical properties of semiconductors, semiconductor layer structures and interfaces; optoelectronics; optical instrumentation, particularly modulation spectroscopy and ultra-fast laser spectroscopy.

Richard Newbury

Experimental condensed matter: low dimensional semiconductor systems, mesoscopic devices. Studies involving very low temperature, high magnetic field. High pressure physics. Superfluidity and superconductivity.

Michelle Simmons

Atomic-scale electronics for next generation computing. Quantum mechanics and transport phenomena.

John Storey

Infrared, far-infrared, mm and radio astronomy, HII regions, molecular clouds and star formation; infrared detectors and instrumentation; electronics, imaging, antarctic astronomy.

Oleg Sushkov

Quantum many body theory including work in condensed matter, nuclear and atomic physics.

John Webb

Cosmology, hubble space telescope observations; quasar spectroscopy; light element abundances; variability in the Fundamental Constants.

Joe Wolfe

Musical Acoustics: investigations of musical instruments, of the human vocal tract and of their interaction. Information, coding and processing of sound in the ear and in artificial systems. Thermal physics in biology, especially cryobiology and water relations.

Associate Professors

Michael Box

Radiative transfer in the earth's atmosphere; multiple scattering, perturbation techniques; climate effects of aerosols, remote sensing from satellites; scattering by haze and cloud particles.

Michael Burton

Infrared astronomy, including the interstellar medium, supernova remnants, shock and fluorescent excitation of molecular clouds, star formation and the galactic centre; millimetre astronomy, Antarctic astronomy, science communication.

Alex Hamilton

Quantum transport phenomena in low dimensional semiconductor structures (2D quantum wells, 1D quantum wires, and 0D quantum boxes), and the effects of inter-device interactions in multi-component semiconductor nanostructures; solid state quantum computation.

Gary Morriss

Equilibrium and nonequilibrium statistical mechanics, chaotic dynamical systems, molecular hydrodynamics.

John Smith

Electrical characteristics of biological and artificial membranes. Electrodifusion theory. Acoustics of musical instruments and the vocal tract; optimization of impedance measurements

Marion Stevens-Kalceff

Condensed matter physics, microcharacterisation of the defect structure of wideband gap materials, irradiation induced defect generation and transformation, advanced electron microscope techniques and scanning probe microscopy.

Senior Lecturers

Mary Beilby

Molecular basis of salt tolerance in plants. Unusual transport systems in marine algae bryopsidophyceae multimedia in research and teaching.

Gail Box

Inversion of multispectral radiometer data to obtain information about aerosol size distribution; aerosols and the visual air quality of Sydney; relationship between physical and chemical properties of aerosols and their optical properties.

Maria Cunningham

Molecular line astronomy; millimetre wave astronomy; observational interstellar chemistry; biomolecules in the interstellar medium; chemistry of star formation regions.

Michael Kuchiev

Multiphoton many-electron processes in atoms in strong laser fields. Atomic collisions which result which result in the final states with several low-energy charged particles; physics of instantons and its application to quantum gravity.

Adam Micolich

Experimental studies of the electron properties of strongly interacting semiconductor nanostructures. Fabrication and measurement of organic electronics and nanodevices.

Krystyna Wilk

Isolation, characterization and structure determination of algal light harvesting proteins. Research involves crystallization of proteins and analysis of x-ray diffraction data obtained for protein crystals.

Lecturer

Jacinda Ginges

Theoretical physics

Emeritus Professors

Hans Coster

Electrical properties of living cells and the membranes surrounding cells. Impedance spectroscopy and the electro-dynamics of cells in radio frequency electric fields leading to the creation of hybrid cells which have the potential to produce therapeutic materials such as monoclonal antibodies. Related research includes electrodisinfection of water, biosensors and molecular films.

Heinrich Hora

Laser and plasma theory (quantum and relativistic effects) multivalley band theory for semiconductors.

H. Julian Goldsmid

Thermoelectric materials and devices.

Jaan Oitmaa

Solid State Theory: Phase transitions and critical phenomena; magnetism; lattice dynamics; superconductivity.

Adjunct Professors

Neville Fletcher

Music acoustics.

Wallace Geldart

Solid state theory

David Neilson

Condensed Matter Theory: Strongly correlated electron systems in semiconductors; metal-insulator transition in 2D; disordered electron glass; electron bi-layers; quantum wires; superconductor-nanostructure interfaces.

Research Staff

Anderson Albuquerque Pereira

Theoretical Physics

Andre Almeida

Music Acoustics

Kenji Bekki

Astrophysics; numerical simulations of galaxy processes.

Julian Berengut

Theoretical Physics

Robert Bursill

The theory of excited states in conjugated molecules, computational quantum chemistry, low-dimensional systems in condensed matter, lattice gauge theory.

Warrick Clarke

Atomic electronic devices – fabrication and electrical characterisation of novel atomic scale devices using a 4 probe scanning probe microscope.

Nadia Court

Centre for Quantum Computer Technology

Stephen Curran

Astrophysics- observational cosmology

Andreas Fuhrer

Quantum transport measurements in low dimensional silicon donor devices and semiconductor nanowires. Fabrication of three dimensional donor nanostructures using scanning tunneling microscopy.

Maeva Garnier

Music Acoustics

Jacinda Ginges

Atomic theory

Stephen Harrop

Structure and architecture of proteins by x-ray crystallography.

Hans Huebl

Centre for Quantum Computer Technology

Fay Hudson

Nanofabrication and infrastructure development for the Integrated Quantum Computer Devices program.

Paul Jones

Astrophysics

Oleh Klochan

Condensed Matter Physics

Michael Kuchiev

Multiphoton many-electron processes in atoms in strong laser fields. Atomic collisions which result which result in the final states with several low-energy charged particles; physics of instantons and its application to quantum gravity.

Jon Lawrence

Astrophysics.

Theodore Martin

Quantum Electronic Devices

Linda Macks

Centre for Quantum Computer Technology

Nishen Naidoo

Biophysics

Andre Phillips

Airborne remote sensing; infrared instrumentation and satellite communications.

Thilo Reusch

Scanning probe microscopy for fabrication of novel quantum electronic devices in silicon. Investigation of atomic-scale structural and electronic properties of semiconductor surfaces and heterostructures using scanning tunneling microscopy and spectroscopy. Surface chemistry and adsorbates on silicon surfaces.

Frank Ruess

Design fabrication and measurement of atomically controlled 2D, 1D and 0D SiP device architecture patterned by STM.

Giordano Scappucci

Development and electrical characterisation of low temperature oxides in ultra high vacuum. Nanoscale device fabrication using STM.

Virginia Shepherd

Plant cell biology; fluorescence microscopy, cytoskeleton, cell-to-cell communication, dynamic vacuoles, action potentials, the ascent of sap, Australian native fish (especially gudgeons) ostracods, life of temporary ponds, history and philosophy of science; life and work of JC Bose.

Clare Sloggett

Theoretical Physics

Lasse Taskinen

Condensed Matter Physics

Ivan Terekhov

Theoretical Physics

Chris Tinney

Astrophysics

Laurens Willems van Beveren

Centre for Quantum Computer Technology

Visiting Professors**Alan Walker**

Mechanisms of solute transport in plant cells; models for mycorrhizal infection and root growth in plants and of combined nitrogen movement through ecosystems.

Visiting Associate Professors**Chris Hamer**

Lattice gauge theory of the strong interactions; critical phenomena in statistical mechanics.

David Miller

Foundations of quantum mechanics; time-symmetric formulations of quantum mechanics; applications in condensed matter physics

Robert Stening

Electric currents and fields in the ionosphere, winds and tides in the upper atmosphere which drive these currents. Lunar tidal effects on the ionosphere; computer models of the low-latitude ionosphere.

Gordon Godfrey Visitors**Professor Vladimir Dmitriev**

Budker Institute of Nuclear Physics

Professor Harald Fritsch

University of Munich

Professor Rajiv Singh

University of California, Davis

Professor Alex Milstein

Budker Institute of Nuclear Physics

Visiting Fellows

Frederick Green

Theory of non-equilibrium transport and noise in nanostructures and devices

Madan Kaila

Quantum Information Science: Study of Basic Theories of Quantum Information Physics. Modelling in Quantum Information Imaging, particularly in the field of Magnetic Resonance Imaging in the Human Brain (MRIOHB). MRI Diagnostics (MRID) of Human Brain Disorders.

Gemini Deputy Scientist

David Woods

Astrophysics

Research Assistant

Thuan Huynh

Biophysics

Administrative Staff

Ranji Balalla

First Year Office

Joji Conducto

Administration & Finance

Patricia Furst

Administration & Teaching

Susan Hagon

Teaching

Karen Jury

CQCT

Zofia Krawczyk

Atomic Electronics group

Venus Lim

CQCT

Stephen Lo

Administration & Finance

Savita Sardana

CQCT

Alisha Toft

CQCT

Robert Walton

CQCT

Professional Officers

Terry Chilcott
Biophysics

Vladimir Dzuba
Theoretical

Jon Everett
Astrophysics

David Jonas
Computing

Patrick McMillan
Third Year Laboratory

Barry Perczuk
Third Year Laboratory

Bob Starrett
Semi-Conductors

Frank Wright
SNF

Computer Systems Officer

Simon Yin
CQCT

Technical Consultant UNIX

Kristien Clayton
Computing

Cryogenics Manager

David Barber
CQCT

Senior Technical Officers

Michael Benton
Second Year Laboratory

George Hatsidimitris
Webmaster

Garry Keenan
Demonstration Unit

Andre Skougarvesky
CMP & SNF

Technical Assistants

Diana Edler
First Year Laboratory

Susan Fraser
First Year Laboratory

Store Officer

Dave Ryan
Administration

Casual Research Assistants

Jane Cavanagh
Musical Acoustics

Casual Senior Technical Officer

Tamara Reztsova
Second Year Laboratory