“Somewhere, something incredible is waiting to be known.”

CARL SAGAN
1934 – 1996
Our research programs are designed to help you advance your research interests while also developing professional skills and networks.

A GLOBAL PERSPECTIVE
Take advantage of our global reputation for research excellence, top international rankings and award-winning research staff who are the best in their fields. As a postgraduate student, you will work alongside world leaders in research, have the opportunity to conduct studies overseas and develop a comprehensive perspective of the applications of research in the real world.

LINK WITH INDUSTRY AND BUSINESS
Many graduates from our research programs work in applied research. Develop your ability to identify needs in the market and understand the practical applications of research through your degree. Many research groups work with industry and business partners. You will have the opportunity to be at the forefront of innovation and development, while gaining valuable professional networks. Learn how to take a multidisciplinary approach to provide industry solutions and work in diverse environments.

BECOME A RESEARCH LEADER
Stretch your talent and develop leadership skills. You will have access to a wide range of opportunities to cultivate professional skills through workshops, seminars, career development opportunities, international research symposia and networking events. You will become a well-rounded confident leader.

FLEXIBLE OPTIONS
Whatever your research background and future goals, you can select a research degree to suit you - from a one year graduate diploma to a full doctorate. You can choose research programs that are clinical, theoretical or applied, or a combination of these. Our articulated programs allow you to start your research with a short qualification, with the flexibility to extend into a more advanced research degree if you choose.

RESEARCH IS YOUR GATEWAY
There are many great reasons to study at the University of Sydney.

RESEARCH EXCELLENCE
The University of Sydney is ranked in the top 40 universities in the world (QS Ranking 2013/14). In terms of scientific output, the University of Sydney has been ranked first in Australia and first in the Oceania region in the Scimago Institutions Rankings World Report 2013, which measures international research rankings. Our reputation for scientific excellence attracts the best researchers, significant research funding and prestigious prizes.

The Division of Natural Sciences is home to numerous centres of excellence and is an integral part of new multidisciplinary research hubs at the University such as the new Charles Perkins Centre, the Centre for Carbon Water and Food, and the Australian Centre for Microscopy and Microanalysis.

EXCELLENCE IN TEACHING AND LEARNING
The University of Sydney attracts some of the best students in Australia and the world. We provide the highest quality learning and teaching, and foster intellectual inquiry, academic freedom and integrity, and ethical practice in academic endeavors. At the heart of all of this is an exciting and stimulating student-centred learning and teaching environment.

SUPPORTING OUR STUDENTS
At the University of Sydney we offer a number of programs and options that will really add value to your course and career prospects, such as professional development activities, specialist postgraduate study skills workshops, and networking events. We also want to ensure you are supported, so we offer a range of services including: the Careers Centre, accommodation information service, financial assistance and disability services to name a few.

WE CREATE LEADERS
Many of our graduates have gone on to become inspirational leaders, making a positive difference in Australia and around the world. Our alumni have changed the face of global science and continue to change our national and worldwide agendas.

A RICH AND VIBRANT STUDENT LIFE
With hundreds of clubs and societies, cafes, bars, bands, theatre productions, sports, three sporting complexes, and Australia’s oldest student newspaper, Honi Soit, you will be a part of Australia’s most vibrant and active student community.

OUR CAMPUS
As a research student in the natural sciences you will have access to the latest research facilities and specialist equipment. Choose from facilities located across several campuses and centres. Take advantage of the University of Sydney’s beautiful campus, a combination of rich heritage and modern architecture located in Inner Sydney, one of the world’s most livable cities!

GROUP OF EIGHT (Go8)
The University of Sydney is a member of the Group of Eight (Go8), a coalition of leading Australian universities, intensive in research and comprehensive in general and professional education. The Go8 exists to enhance the contribution of its member universities to the nation’s social, economic, cultural and environmental well-being and prosperity. Currently the Go8 receives over 70% of national competitive research grants, conducts over 60% of Australian university research, has produced all Australian-educated Nobel Prize winners and dominates university links with industry.

www.go8.edu.au

THE ASSOCIATION OF PACIFIC RIM UNIVERSITIES (APRU)
36 universities from 16 countries located on the Pacific Rim constitute APRU with the diversity of nations represented ensuring a beneficial exchange of ideas. All member universities are deemed to be at the educational forefront in their own country, delivering pioneering programs across their range of disciplines. Research and an international focus are of utmost importance to members who strive to be of service to the local and global communities.

www.apru.org

AFFILIATIONS
The University of Sydney is a proud member and affiliate of the following organisations.

THE NATIONAL HEALTH AND MEDICAL RESEARCH COUNCIL (NHMRC)
The NHMRC is a government organisation, which administers both research funding and development of recommendations relating to this research. It aims to raise the health standards of all Australians and fosters the development of consistent health standards between states.

www.nhmrc.gov.au

AUSTRALIAN RESEARCH COUNCIL (ARC)
The ARC was established to facilitate the Australian Government’s vision of improving the lives of all Australians through research. The organisation is responsible for furthering quality, ethical research through the dissemination of substantial research grants while also nurturing partnerships between educational institutions and industry.

www.arc.gov.au
Researchers in the Faculty of Agriculture and Environment address these challenges and offer a range of exciting graduate programs that are tailored for the modern application of science in this changing world.

ABOUT US
The interdisciplinary nature of the faculty presents exceptional opportunities to develop your research and broaden your interests and learning experience. An emphasis on innovative development and applied research has placed the faculty at the forefront of its field. Our students conduct research in a wide range of learning environments and have access to some of the world’s best-equipped and newest specialist research facilities, including the Centre for Carbon, Water and Food. The faculty has substantial field stations in western and northern New South Wales offering exceptional large-scale plant growth facilities. Research collaborations exist focusing on managed forests, the health of rangelands and the sustainability of the surrounding environments. The Plant Breeding Institute is one of the largest field research stations in Australia, with over 1200 hectares of farmland and modern laboratory, glasshouse and field facilities. Other faculty field sites support enviable amenities for large-scale field studies in agricultural science, food science, environmental studies, ecology, bushfire research and more.

RESEARCH STRENGTHS
- The faculty’s world-renowned Plant Breeding Institute is one of the largest field research stations in Australia, with over 1200 hectares of farmland and modern laboratory, glasshouse and field facilities. Other faculty field sites support enviable amenities for large-scale field studies in agricultural science, food science, environmental studies, ecology, bushfire research and more.
- The faculty has excellent collaborative relationships with CSIRO, National and State government departments and important corporate stakeholders in agriculture, which present opportunities for cross-instructional and interdisciplinary research.
- The faculty has an excellent collaborative relationship with international CSRF, National and State government departments and important corporate stakeholders in agriculture, which present opportunities for cross-instructional and interdisciplinary research.

CONTACT
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Faculty of Agriculture and Environment
T +61 2 8627 1002
E agriculture.pg@sydney.edu.au
sydney.edu.au/agriculture

SPECIALISATIONS
The Faculty of Agriculture and Environment specialises in the research challenges associated with food, water and soil security. Our scientific expertise includes plant breeding and genetics, soil science (chemistry, physics, biology), hydrology, biogeochemistry, plant biology and pathology, and spatial information systems. These disciplines and skills are applied in fields such as precision agriculture and agronomy, sustainable horticulture, management of forest and rangelands, management of air and water quality. Through our links in the School of Economics we provide an additional focus on the economics of agricultural and water markets, foreign aid and foreign investment, land and water reform and policy, bioeconomics and resource management, natural resource accounting and measures of sustainability.

“Climate change and a growing human population are putting ever-increasing pressure on global food, water and soil security. Modern agricultural and environmental science must respond to these challenges, providing the knowledge and skills to improve nutrition and human health and to develop emerging markets in new commodities such as carbon trading.”

“My area of research is investigating a disease caused by an exotic pathogen that is affecting native vegetation in the Greater Blue Mountains World Heritage Area.”

ZOE-JOY NEWBY
PHD IN AGRICULTURE
“I am studying a group of deep-sea crustaceans, the *Asellota*, which have great diversity in both family and species number. This group of isopods is present in many basins in the world, but little is known about their evolution, including the processes that led to their current distribution.”
**CHEMISTRY**

The School of Chemistry at the University of Sydney is one of the main centres for chemical research and education in Australia and has access to a comprehensive range of modern research and teaching facilities. The school attracts an outstanding range of talented students. It has a large cohort of local and international postgraduate research students, and offers a vibrant and world-class research environment.

**ABOUT US**

The School of Chemistry has a well-deserved international reputation for excellence in research and teaching. It is consistently placed in the top grouping of chemistry departments in Australia. As a postgraduate student, your training is intimately linked with research activities. You will be able to take advantage of the school's strong collaborative links with industry such as through the Advanced Catalysis for Sustainability Lab and the Key Centre for Polymers and Colloids. In 2012, members of the School of Chemistry received more than $7.5M in new research funding, leading to a total of 52 Discovery Grants, 3 ARC Future Fellowships, 7 other Fellowships and 6 Linkage Grants from the Australian Research Council, totaling (with other grants) $12.1M in competitive research funding. We greatly value our postgraduate community and provide academic and professional support through your candidature. You will have access to modern research instrumentation including major research facilities for NMR Spectroscopy, mass spectrometry, x-ray crystallography, optical spectroscopy, electrochemistry, high pressure liquid chromatography, analytical and preparative chromatography, and high performance computing. Our research infrastructure – underpinning and supporting all research programs – includes in-house mechanical and electronic workshops. The SciTech Library (a branch of the main University Library) holds all of the main chemistry titles and provides online access to national and international databases. All students have access to state-of-the-art instrumentation, and work in newly renovated laboratories and offices.

**RESEARCH HIGHLIGHTS**

The school is one of the best equipped for chemical research in Australia, and our research is enhanced by dedicated, high-level professional and technical expertise and facilities for NMR spectroscopy, mass spectrometry, vibrational and optical spectroscopy, x-ray crystallography, separations, thermophysical properties, and high-performance computing. We hold research collaborations in numerous countries including the United Kingdom, Japan, India, USA, France, Portugal, Germany, China and Denmark. We share collective expertise and collaborations with major national and international research facilities including the Australian Synchrotron and ANSTO Topaz research reactor, the Australian National Beamline in Japan, the US NIST Center for Neutron Research, and the UK’s Rutherford-Appleton Laboratory.

The school includes 36 academic staff, six Fellows of the Australian Academy of Science, a Federation Fellow, two Future Fellows and more than 60 research fellows/postdoctoral staff.

**AREAS OF RESEARCH**

The School of Chemistry’s areas of research include:
- biological chemistry/chemical biology
- chemical education
- computational and theoretical chemistry
- drug discovery and medicinal chemistry
- green chemistry and renewable energy
- materials chemistry
- molecular design and synthesis
- molecular spectroscopy and photonics
- neutron and synchrotron diffraction and spectroscopy
- soft materials
- supramolecular chemistry

**CONTACT**

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**RESEARCH HIGHLIGHTS**

Studying at the School of Geosciences will reward you with valuable skills, enabling you to launch a professional career with the potential for out-of-doors work in exotic locations, international travel, and opportunities to contribute to a more sustainable future.

**GEOGRAPHY**

As the need to find solutions to issues of environmental sustainability, population change and globalisation have become more challenging, the skills and knowledge of geographers have come to the fore. Graduate training in geography provides the toolkit to think critically about the relationships between people, environments and places, and work towards resolving complex real-world problems.

The University of Sydney’s expertise in geography encompasses a breadth of research fields including the challenges of managing environment and development in the Asia-Pacific, making our cities sustainable places to live, understanding the restructuring of populations and economies across the world, forging sustainable futures for communities in rural Australia, and creating knowledge about the ways that populations adapt to the uncertainties of climate change and food insecurity. Our geographers are key participants in the University of Sydney’s Southeast Asia Centre and various forums and institutions connected to sustainability, urban futures and global development. As a postgraduate student, you will have the opportunity to work alongside academic staff with high-profile international reputations in a tight-knit and supportive research community.

Our geographers have extensive linkages to government departments, other universities and research institutes within Australia and overseas. Our research community is richly diverse, comprising postgraduate students from Thailand, Laos, the Philippines, Nepal, India, Vietnam, Iran, Germany, the Netherlands, Taiwan, Tonga, Indonesia and Cambodia.

**RESEARCH STRENGTHS**

- Geography at the University of Sydney is highly ranked nationally and internationally. In the Australian Government’s ‘Excellence in Research for Australia’ 2012 rankings, Geography at the University of Sydney was ranked ‘Above World Standard’ and equal to the best in the nation. Internationally, the 2012 QS World University Rankings ranked the University of Sydney’s performance in Geography as 35th in the world.
- Extensive international collaborations, particular expertise in South and Southeast Asia.
- Strong interdisciplinary relationships across the University and with industry and government.

**SPECIALISATIONS**

- Natural hazards and disaster risk reduction including physical sciences of hazard processes; social sciences of human knowledge and behaviour; disaster policy and planning; risk management; climate extremes and climate adaptation.
- Natural resource management and its governance in Southeast Asia, and rural livelihoods and food security in South and Southeast Asia.

- Geographies of development, globalisation, and global value chains.
- Environmental histories and climate change adaptation.
- Sustainability, citizenship and cultural spaces in urban environments, the ecological footprints of cities, transport planning in Sydney, urban public spaces, cultural geographies of music and daily life.
- Social, economic and environmental sustainability in regional Australia, water management and farm futures.
- Environmental and ethical issues associated with animal industries.

“**My project involves renewable fuels and chemicals. I design sulfur resistant bimetallic catalysts that have potential in processing biomass into renewable fuels. I test other catalysts with green reagents to make valuable chemicals normally sourced from crude oil. I like to think that I am doing my part to save the planet.”**

**JESSICA STANLEY**

**PHD CANDIDATE**

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The School of Geosciences formed in 1998 to encompass study in geography, along with geology and geophysics. Our long tradition of rigorous postgraduate research is complemented by an active geophysical program.

“**My research will contribute to a better understanding of how farmers have responded to changes concerning land and water ownership, and how these changes are influencing agricultural production in Australia.”**

**ERIN SMITH**

**PHD CANDIDATE IN HUMAN GEOGRAPHY**
“My research focused around coupling the (high-performance computer modelling) Underworld code to a seismic simulation code called RSF Madagascar, and in doing so, I was able to use my programming skills to solve real scientific problems.”

LUKE MONDY
PHD CANDIDATE EARTHBYTE GROUP

HISTORY AND PHILOSOPHY OF SCIENCE

History and Philosophy of Science is a fascinating discipline situated at the crossroads of science and arts.

It examines past and current developments in all areas of science, technology, and medicine from a range of humanistic perspectives, using socio-historical and philosophical techniques to explore their social, political, cultural, and conceptual ramifications. HPS is an ideal way to critically engage with science and its social and cultural significance.

ABOUT US

The researchers associated with the Unit for HPS have excelled in developing interdisciplinary and innovative approaches to investigate and analyse developments in science, medicine and technology and continuously develop new and innovative approaches in the field.

Our staff’s active research records have attracted significant funding from both Australian and international sources. Our researchers are actively engaged in international research projects and have a broad range of international connections.

SPECIALISATIONS

- History and Philosophy of Science
- Early Modern Science
- Science and Technology Studies
- Colonial and Post-Colonial Science and Medicine (with a focus on Asia)
- History and Philosophy of the Human Sciences

CONTACT

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GEOLOGY AND GEOPHYSICS

As a postgraduate student you will have the opportunity to take advantage of a well established and interdisciplinary research community. Our research spans a wide range of fields and has established collaborations across the world.

We are a leader in the development and application of advanced computational solutions for geoscientific research. Under the direction of Australian Laureate Fellow Dietmar Muller, the EarthByte group leads the development of the community GPlates-PaleoGeographic Information software (www.gplates.org), which has become the global standard for analysing Earth’s evolution in a plate tectonic context, being used in 137 countries.

International research collaborations exist in China, France, Norway, Portugal, Switzerland, Japan, Germany, Canada, the United Kingdom, India, Indonesia, South Korea, Singapore, Vietnam, Taiwan, Thailand and the USA. The School supports the scientific and policy development activities of United Nations Environment Programme (UNEP–GRID Arendal, an implementing agency for the UNEP program of work.

RESEARCH STRENGTHS

- The Geocoastal Research Group (GGRG), which includes researchers from both Geography and Geology/Geophysics, is one of the nation’s leading research groups focused on the full spectrum of coastal sedimentary environments, spanning river systems to the edge of continental margins, encompassing both clastic and carbonate environments.

- Strong integration with the University’s wider marine science community via the University of Sydney Institute of Marine Science (USIMS), which connects geocoastal research with the related fields of coastal marine ecology, marine robotics and coastal engineering.

- A foundation member of the Sydney Institute of Marine Science (SIMS), a flagship interdisciplinary facility located on the picturesque shores of Sydney Harbour.

- The origin and emplacement of ophiolites and their relationship to arc-continent collisions involves work in eastern Australia, New Caledonia, the former Tethyan ocean and comparative studies of Archaean and Palaeoproterozoic basins.

SPECIALISATIONS

Marine processes

Research encompasses coastal studies, tsunamigenic submarine land-sliding, tectonics and geophysics of the ocean basins, and palaeoceanographic and palaeoclimatic modeling.

Early Earth evolution

Understanding the origin and evolution of life on Earth, the emergence and dynamic histories of continents, and the links between fluid- rock interactions, tectonics, and igneous rocks.

Environmental geology and geochemistry

Research in this field concentrates on the Sydney region, principally examining marine and estuarine contamination, storm water remediation, river-bank stability and sediment dynamics.

Mineral and petroleum resources

Research includes all aspects of resource exploration, including petroleum, and mineral resources based on petrographic, geochemical, computational and geophysical methods.

Geophysics

Research in geophysics ranges from petroleum exploration geophysics to exploration and global, planetary-scale geophysics based on interactions between the Earth’s mantle, crust, sediments and the oceans, including the modeling of long-term sea level change.

Geocoastal Research

Research encompasses river, estuarine, coastal and coral reef morphodynamics and focuses on understanding sedimentary processes operating on a multiscale continuum from daily changes to Holocene and Quaternary coastal and continental margin evolution.

E-Research

Research in plate kinematics, global and regional geodynamics, frontier basin exploration, palaeo-climate modelling, formation of Australian opals, paleoastress modelling.

Tectonics

Research in convergent margins and collision zone geology, subduction initiation and offsets.

CONTACT

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I enjoy the fact that my work is in that area between the sciences and the arts talking to psychologists and physicians about the history of medicine, philosophy of science, and examining what approaches from the humanities can tell us about science.”

HANS POLS
ASSOCIATE PROFESSOR
UNIT FOR HISTORY AND PHILOSOPHY OF SCIENCE
Graduate students are supervised in individual departments under the direction of the institute. Staff liaise closely with several research units (where most of the graduate training occurs), including the Ocean Sciences Institute, the Coastal Studies Unit and the Centre for Ecological Impacts of Coastal Cities. This multidisciplinary approach to marine research training is a unique feature of the marine sciences program.

ABOUT US
USIMS is an umbrella organisation for eight existing research centres including the Centre for Research on Ecological Impacts of Coastal Cities; the Coastal Studies Unit; the Ocean Technology Group; the Australian Ocean Drilling Program and the Centre for Geotechnical Research. USIMS coordinates the efforts of these centres and helps to facilitate research that crosses disciplinary boundaries. These research centres attract a significant amount of funding annually, which in turn attracts top local and international students, thus producing a challenging academic atmosphere that brings out the best that research students have to offer. USIMS is a partner in the Sydney Institute of Marine Science (SIMS), a consortium involving all of the prominent universities in the Sydney region.

RESEARCH STRENGTHS
- Specific facilities for marine research include One Tree Island Field Station on the Great Barrier Reef, the Croommel Biological Field Station in Broken Bay, the SIMS Research Station in Sydney Harbour and the Cape Banks Scientific Marine Research Area.
- Significant equipment for field research, seismic equipment, environmental monitoring and access to super-computing for modeling and visualisation, the Australian Centre for Microscopy and Microanalysis and the Macintosh Quaternary Dating Centre.

SPECIALISATIONS
Biological sciences
There are research programs in temperate and tropical marine ecology – experimental coastal ecology – the behaviour and ecology of fish – photosynthesis in marine phytoplankton – effects of pollution on coastal or marine environments.

Earth and geographical sciences
There are research programs in the dynamics of beaches and surf zones – the impact of climatic change on coastal environments – evolution of coastal margins – modelling at the University Computer Centre, Modern Geographic Information System (GIS) of the coastal environment – continental margins and deep sea basins – marine geophysics – the processes of marine sediment deposition

CONTACT
Associate Professor Ross Coleman, Graduate Adviser:
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sydney.edu.au/science/geosciences

“I grew up by the sea in England and have always loved the ocean. Australia seemed like the perfect place to study a PhD in marine science and I chose the Centre for Ecological Impacts of Coastal Cities at Sydney University due to its excellent facilities and to have the opportunity to work alongside world-class researchers in my field.”

REBECCA MORRIS
PHD CANDIDATE
The School of Mathematics and Statistics is one of the largest mathematics schools in Australia, with more than 2800 students enrolled in first year units of study. The school pursues a vigorous program of teaching, scholarship and research. In particular, the postgraduate research is varied and flexible, catering for more than 50 students from many backgrounds.

ABOUT US
The school supports a policy of active research, proudly insisting on the highest standards of academic achievement. Since 2010 the School has published more than 463 papers in refereed journals, thirteen book chapters and two books. Moreover, 27 staff from the school received ARC Discovery Grant funding of about $14m via 34 distinct projects, plus an ARC Linkage award of $165k with the NSW Institute of Sport to study the dynamics of diving.

The school values your professional development and holds regular seminars, workshops and conferences that ensure that its members stay abreast of latest developments. It also supports an active program of long-term and short-term visits by distinguished international academics, that broaden your global outlook.

The school also offers a modern library and an extensive computer network of workstations.

RESEARCH HIGHLIGHTS
- The school has extensive collaborations with China, Canada, France, Germany, Japan, Russia, UK and the United States.
- The school developed MAGMA, a world-class computational algebra and number theory package which is used both in industry and by many branches of pure and applied mathematics.
- The school has three Fellows of the Australian Academy of Science, one Georgina Sweet Australian Laureate Fellow, two Australian Professional Fellows, five Future Fellows and four ARC Discovery Early Career researchers.

SPECIALISATIONS
Algebra and Representation Theory
A renowned world centre and largest Australian research group in this area with four professors, two associate professors and one senior lecturer, including one Fellow of the Australian Academy of Science, two Australian Professional Fellows, three medalists of the Australian Mathematical Society and one Future Fellow. Research strengths include geometric representation theory, Hecke algebras, Lie theory and quantum groups, and applications in mathematical physics.

Applied Mathematics
This group consists of four professors, four associate professors, one senior lecturer, five lecturers, one ARC Laureate Fellow, two Future Fellows and three ARC Discovery Early Career researchers. There are more than 26 postgraduate students in this group conducting research across a vast range of interests.

Bioinformatics
Bioinformatics refers to the developing field of applying quantitative reasoning, including mathematical modeling, statistical analysis and computer science methodology to study large biological datasets, generated through high throughput biotechnological assays such as modern sequencing technologies. The group’s PhD students exchange ideas in weekly seminars.

Financial Mathematics
The Financial Mathematics group is focused on problems of default risk and modelling stochastic volatility. A special emphasis is given to approaches that combine practical relevance with mathematical interest. Members of the group have worldwide collaborations with leading research institutions and banks in Europe and US.

Computational Algebra
This group focuses on the development of effective algorithms in algebraic geometry (schemes, sheaves, surfaces), arithmetic geometry (rational points on curves), L-functions, arithmetic fields (class field theory, Galois theory and function fields) and group theory (structure and representations of finite groups).

Nonlinear Analysis
Research strengths include Complete Integrability, Elliptic Partial Differential Equations and Mathematical Biosciences.

Geometry, Topology and Analysis

Statistics

CONTACT
Postgraduate Director, School of Mathematics and Statistics
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sydney.edu.au/science/maths

“I have always enjoyed mathematics so it seemed like the natural choice to continue studying it after finishing my honours year.”

SAM BUTLER
PhD CANDIDATE
The School of Medical Sciences (SoMS) forms part of the Sydney Medical School where it teaches a range of discipline-areas to medical and dental students; however, it is also academically part of the Faculty of Science where it teaches in many discipline-based courses in the sciences.

Biomedical Science
Biomedical Science, located in Cumberland Campus, Lidcombe, is active in a broad range of research areas including anticancer drugs discovery and therapy, antimicrobial resistance, cardiovascular control, cellular and reproductive toxicology, elite music performance, neurophysiology (including molecular neuroscience and neurodegeneration), respiratory motor control, sensory systems, shoulder function and dysfunction, vision and visual neuroscience, reflecting the diverse interests and expertise of staff.

Pharmacology
Pharmacology is a vibrant and research active department. Research groups use cutting edge technology to understand how drugs affect the body and also to develop new drugs to treat disease. The discipline attracts research funds from the National Health and Medical Research Council (NHMRC) and other similar bodies.

Physiology
Physiology has a strong tradition in research and this commitment to understanding the function of the human body is reflected in the discipline’s high research profile.

Pathology
Pathology has very active research groups investigating a large number of human diseases. A wide variety of modern techniques, using both human tissue and experimental animals, are employed to investigate disease causes and processes. The discipline has a highly regarded science honours and a large number of students in the PhD program.

Anatomy and Histology
Anatomy and Histology has internationally renowned researchers offering exciting research projects for students wishing to undertake postgraduate programs. The research labs within the discipline are well-funded from government and corporate bodies and have an outstanding reputation for publications in top international journals. The discipline is one of the largest in the university, and indeed the largest of its type in Australia.

The School of Molecular Bioscience is one of the first and largest schools in Australia devoted to research and teaching in the areas of biochemistry, structural biology, molecular biology and genetics, cell biology, microbiology, proteomics and functional genomics and human nutrition and metabolism.

The mission of the school is to unravel the biology of living organisms at the molecular level and to advance our understanding of cell and tissue function, development and whole body metabolism in health and disease. At the heart of the school’s research and teaching efforts is a vibrant and multidisciplinary community of accomplished academic and research professionals.

About Us
The School of Molecular Bioscience is committed to enhancing your research achievements by supporting interdisciplinary research, collaborative research with an international scope, and proactive student and postdoctoral recruitment.

Research Strengths
In 2013 the school was comprised of a total of 66 academics (including 4 Fellows of the Australian Academy of Science, 1 Federation Fellow, and 22 postdoctoral fellows) and 36 general staff.

The school received in excess of $27 million in competitive research grants from government, industry and charity.

Research lab facilities have major presence in the School of Molecular Bioscience. It is committed to enhancing your research achievements by supporting interdisciplinary research, collaborative research with an international scope, and proactive student and postdoctoral recruitment.

The organisation of the school reflects its research and teaching strengths. It is composed of five research disciplines with a broad scope. These disciplines range from clinical applications of nutrition research to the development of new biophysical methods. Research efforts are strengthened by the presence of 22 post-doctoral research Fellows funded by the ARC, NHMRC, NIH, Royal Society of London, and the Welcome Trust.

Our research outputs are most relevant to Institute for Scientific Information (ISI) categories of biochemistry and molecular biology, microbiology, and nutrition and dietetics. The impacts of our research are in understanding of fundamental biomedicine processes, the molecular mechanisms of infectious and genetic diseases, metabolic disorders, and environmental health.

The school houses high-quality infrastructure for a wide range of experimental approaches, including recombinant DNA technology, the generation of transgenic animals, tissue and cell culture facilities and mass spectrometry, as well as excellent facilities for the study of metabolism and nutrition.

As a postgraduate student you will have access to a superb range of major instrumental facilities. Particular strengths include structural biology (X-ray and NMR) and proteomics, microbiology, molecular biology and genetics, and nutrition and metabolism.

The school has a major presence in the new Charles Perkins Centre research and education hub. Several key research groups will relocate to brand new laboratories, supported by world-leading University Core Facilities in Mass Spectrometry, Advanced Cytometry and a node of the Australian Centre for Microscopy and Microanalysis.

Research Strengths
In 2013 the school was comprised of a total of 66 academics (including 4 Fellows of the Australian Academy Academy of Science, 1 Federation Fellow, and 22 postdoctoral fellows) and 36 general staff.

The school received in excess of $27 million in competitive research grants from government, industry and charity.

The school conducts leading research in the basic and biomedical sciences that contributes to the health and well being of our communities. In 2013, the school published more than 165 research papers.

Specialisations
Areas of research include:
- Biochemistry and biophysics, molecular biology, structural biology, cell biology and proteomics
- protein structure and the molecular basis of disease by NMR, X-ray crystallography and protein footprinting
- assembly of human elastic tissue and biofilm first and las high-process
- structural analysis of medically relevant macromolecules
- structures of metalloenzymes
- mechanisms of action of anticancer agents
- diagnosis of leukaemia
- cellular signaling in health and disease
- mechanistic and structural analysis of gene regulation and DNA repair
- mechanisms of cytokine-induced and lipid metabolism.

Microbiology
- genetics of the bacterial cell envelope
- bacterial hunger responses
- experimental evolution in chemostats
- evolutionary origins of variation in bacterial species
- mobile genetic elements in bacteria
- biodegradation of hydrocarbons and xenobiotics
- development of microbial biocatalysts
- bacterial sugars and their role in disease
- proteomic and bioinformatic profiling of infectious disease pathogens.

Nutrition and metabolism
- nutritional requirements in chronic illness
- glycemic index
- safety, weight loss and exercise performance
- diet, obesity and diabetes
- lipid nutrition and metabolism
- epidemiology, aetiology and management of obesity
- interactions between trace elements and lipid metabolism
- minor dietary constituents and cardiovascular disease
- the definition and causes of the metabolic syndrome.

Contact
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The School of Physics at the University of Sydney is the leading physics department in Australia, with outstanding staff and students undertaking world-class teaching and research.

Our postgraduate students conduct research across a vast range of interests. With access to supercomputers, modern laboratory facilities and observatories, locally, nationally and internationally, this is the premier environment for physics education and research.

ABOUT US
Postgraduate degree programs are at the heart of a modern education in physics. You will have the opportunity to learn from internationally recognised experts, contribute to original research, and become part of our community of scientists and scholars.

Academic staff within the school are leaders of their fields, providing you with the opportunity to learn physics from the dynamic individuals and groups who are defining the field.

The quality of research within the school is recognised by its housing of five ARC-funded Centres of Excellence and one NHMRC Centre of Excellence. In addition, prominent domestic and international collaborations with the United States, Europe, and Asia, funded through multiyear competitive awards, present a range of opportunities that are unmatched in the region.

You will have an unprecedented opportunity to study and be involved in research projects focused on nanoscience. The school is currently constructing a major new research and teaching facility – the Australian Institute of Nanoscience (AIN) – which builds on our existing world-class facilities.

RESEARCH STRENGTHS
Our research leads the nation and the world through high-profile research projects, and extraordinary levels of research and infrastructure funding:

- major programs in astrophysics and space physics including University-operated telescopes and linkages with the Square-Kilometre Array.
- leading international projects in both experimental and theoretical quantum physics including one of the top 10 world-changing experiments as decided by the BBC.
- large-scale efforts on photonics and optical science for next generation communications technology.
- innovative interdisciplinary efforts in biological and medical physics, spanning computational physics, materials science, brain dynamics, and clinical application.
- a leading role in international research efforts at the Large Hadron Collider, contributing to fundamental tests of nature and work towards the discovery of the Higgs Boson.

SPECIALISATIONS
Astrophysics, Space and Solar Physics
The school’s research activities span various scales, from the surface of the sun to the outer reaches of the galaxy; from studies of space weather and spacecraft development to the evolution of galaxies and the nature of dark matter.

Biological and Medical Physics and Systems Neuroscience
Our interdisciplinary research in this emerging area applies physics knowledge and techniques to analysing, modelling and quantifying biological systems, as well as developing novel clinical treatment approaches.

Condensed Matter and Materials Physics and Nanotechnology
Theory and experiment from the nanoscale to the macroscale with the goal of acquiring a detailed understanding of the fundamental science required to engineer and design novel materials and devices.

Energy and Sustainability
Researchers focus on interdisciplinary sustainability issues, from leading-edge developments in materials research and energy generation, to broader issues in the social and economic aspects of environmental science.

High Energy and Particle Physics
The school’s high energy research program involves participation in major domestic and overseas collaborative experiments.

Photonics and Optical Sciences
Fundamental research in the most vibrant areas of photonics and optical science underpins important applications in telecommunications, health, security, and information processing.

Quantum Science
An exciting, 21st century discipline including experimental and theoretical projects focused on engineering and controlling real quantum systems; from trapped atoms to semiconductor nanodevices.

CONTACT
Student Services, School of Physics
T +61 2 9351 3037
E physics.pgstudents@sydney.edu.au
sydney.edu.au/science/physics

“My work on these biomaterials gives me a rich and diverse experience, providing endless opportunities to learn new things, through interactions with my wonderful colleagues in the life sciences, chemistry and engineering.”

PROFESSOR MARCELA BILEK
PROFESSOR OF APPLIED PHYSICS
PSYCHOLOGY

We were the first established School of Psychology in Australia and are currently one of the largest and most prestigious. Our graduates have a conspicuous record of success: many are now department heads and senior staff in universities and clinical settings around the world, and many have achieved excellence in industry, the media, and politics.

ABOUT US
The School of Psychology currently has over 130 MSc and PhD students who make up part of our vibrant and diverse community. Postgraduate research students coming into the school will enjoy a supportive environment both within their area of research specialisation and also within the wider school community.

While all research students entering the school have direct access to discipline specific research facilities, they are also encouraged to participate in the broader research student community, and develop their methodological and professional skills. Although most postgraduate research students belong to active labs, they are initially based in specialised graduate student work areas to foster integration, learning, and collegiality. There are weekly seminars, colloquia and social events which most graduate students attend, and there is also a highly successful Annual Postgraduate Conference, organized entirely by research students.

In the School of Psychology there is a close relationship between academic staff and the graduate student community, both for research and teaching. In this way, our graduate students benefit from the mentoring they experience in research collaboration and other aspects of professional development.

Many of our current graduate students have been incorporated into the existing research collaborations, both international and local, of their mentors, and many of our past students maintain professional contacts with their former mentors in the school.

RESEARCH STRENGTHS
– The School of Psychology currently holds over $7 million in competitive research funding from government and industry sources, and many of our staff are supported by prestigious Research Fellowships.
– The school has a large number of well-equipped research laboratories for studies in perception, neuroscience, psychophysiology, developmental psychology, cognition, human performance, learning, social psychology, individual differences and clinical psychology.
– Graduate students experience a well-resourced and stimulating intellectual environment for research, which includes competitive top-up scholarships, teaching fellowships, and financial support to attend national and international conferences.

SPECIALISATIONS
The School of Psychology prides itself on its diverse research excellence, and its strong national and international research links. Within the school, there are many areas of research specialisation headed by distinguished researchers. Six areas in which the school is internationally recognised are listed below. Follow the links and discover what we have to offer!

Psycho-oncology sydney.edu.au/science/psychology/cemped
Learning and Behavioural Neuroscience sydney.edu.au/science/psychology/research
Psychopharmacology sydney.edu.au/science/psychology/staff/ian/lab
Clinical Psychology sydney.edu.au/science/psychology/clinical_psychology
Vision Science (Perception) sydney.edu.au/science/psychology/research
Health Psychology sydney.edu.au/science/psychology/research

CONTACT
Dr Ilan Dar-Nimrod, Psychology Postgraduate Coordinator Einpadmin@psych.usyd.edu.au sydney.edu.au/science/psychology

“My time studying at Sydney was crucial in preparing me for my work with children and adolescents with complex difficulties such as anxiety, depression, deliberate self-harm and eating disorders.”

AMANDA GREEN
DOCTOR OF CLINICAL PSYCHOLOGY/MASTER OF SCIENCE GRADUATE
In my home country, the Republic of Ghana, I work as a tutor in the animal health and production college and a veterinary surgeon. I am undertaking postgraduate study at Sydney because it offers me the unique opportunity to acquire new skills and knowledge which I can apply to practices when I return.

VETERINARY SCIENCE

We are recognised internationally as a leading provider of education and a key contributor to the world’s best practice in the care and welfare of animals. Our vision is to be a world leader in veterinary education, animal science and research, focused on the health, production efficiency and welfare of animals, and of benefit to the community.

ABOUT US

The Faculty of Veterinary Science is one of a small elite group of veterinary schools outside North America to receive accreditation from the American Veterinary Medical Association (AVMA). This accreditation encourages support from international students interested in studying at the faculty. The faculty has an international research profile and provides opportunities to undertake research in a variety of preclinical, parasitological and clinical disciplines along with a wide range of research areas supporting production animal industries, wildlife and animal welfare.

The faculty encourages high-level research performance, providing strong guidance, inclusion and support for our postgraduate students at both personal and professional levels. The faculty encourage students to support one another, develop high-level communication skills and present their research for international recognition. Postgraduate research students trained in the faculty continue to excel in their own right in a wide variety of research and higher education endeavours. The faculty has established strong links to the production animal industries, welfare organisations and the veterinary profession and these help support student development and attributes as well as extending their career opportunities.

RESEARCH STRENGTHS

The two faculty clinics (Campden and Camden) have world-class facilities and support research in feline and canine epidemiology, disease diagnosis and control. The Camden clinic is used for research on equine physiology, infectious diseases, behaviour and welfare. Research in the faculty has attained world recognition in many areas.

SPECIALISATIONS

Specialisations include developmental biology, such as gamete and embryo physiology and assisted reproductive technologies used in the sheep and cattle industries. These areas of research support research students who are in strong demand following graduation.

Animal production industries (dairy, sheep, poultry, pigs and more recently fish) are extensive and there is a comprehensive list of suitable research areas for students to consider.

Wildlife research supports students interested in reptile biology, koala diseases and an association with the Australian Marine Mammal Research Centre at Taronga Zoo provides students with further opportunities in wildlife research.

The Farm Animal Health group attracts significant financial support and has a large number of postgraduate students working in animal health research. Important areas of the group’s interest are Johnes’ disease in sheep, infectious diseases of fish, ruminant immunology, the epidemiology of infectious diseases, public health, food safety and biosecurity.

Poultry and dairy foundations provide excellent resources and facilities to support research students in nutrition, pasture usage, avian immunology, epidemiology, reproduction and development of new milking technologies. The ‘Future Dairy Project’ has attracted strong student interests.

Animal production research in developing countries (Australia Awards) provides international students with opportunities to study for higher degree qualifications and assist in development of greater food sustainability.

CONTACT

Veterinary Science Research Enquiries
T +61 2 9351 6933
E vetscience.pg@sydney.edu.au
sydney.edu.au/vetscience

“My project measures and records behavioural and health attributes in farm dogs. Modern canine genomic technologies will allow us to identify genetic markers that are predictive of working dog trainability and success.”

JONATHAN EARLY
PHD CANDIDATE
We are investigating whether agave – a humble succulent – could provide an environmentally friendly solution to powering our transport industry.

Dr Daniel Tan
Senior Lecturer in Agronomy

A research degree requires an in-depth study in a specialised area. Our research degrees have two purposes:
- For you to prepare a substantial piece of work that represents a significant contribution to a particular field of study.
- To train you in general research methodology and equip you with transferable research skills to pursue an academic career or take into a career in industry, business or elsewhere.

There are specific admission requirements for entering a postgraduate research degree. Please check the website for more information.

sydney.edu.au/courses

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Whilst every reasonable effort has been made to include correct and up to date information in this prospectus, you are also advised to consult directly with the Student Centre for domestic students or the International Office for international students so that they can provide you with specific and up to date information about those fees.

PHD SCHOLARSHIPS

There are lots of scholarship opportunities for research students. The table below outlines some of the most popular scholarships for domestic and international students. However, there are many more opportunities available and we strongly recommend that you review the scholarships website for specific details.

Domestic students
Domestic students should contact the University Scholarships Office.
sydney.edu.au/scholarships/research

International students
International student scholarships are listed at the University’s scholarships for international postgraduate students page:
sydney.edu.au/scholarships/prospective/international_postgraduate_scholarships.shtml

Please ensure that if you wish to apply for a scholarship you check the criteria, application details and closing dates carefully: sydney.edu.au/science/fstudent/postgrad/scholarships.shtml

NAME OF SCHOLARSHIP AVAILABLE IN FACULTY (IN THE DIVISION OF NATURAL SCIENCES) DOMESTIC STUDENTS INTERNATIONAL STUDENTS

Australian Postgraduate Awards (APA)* All Y N
FH Loxton Postgraduate (Industry) Scholarship+ Faculty of Agriculture and Environment Y N
Nancy Roma Paech Postgraduate Scholarship+ Faculty of Agriculture and Environment Y Y
University of Sydney Postgraduate Awards (UPA)+ All Y N
Vice-Chancellor’s Research Scholarships (VCRS)+ All Y N
China Scholarship Council^ All N Y
Endeavour Postgraduate Awards* All N Y
International Postgraduate Research Scholarships (IPRS)* All N Y
Sydney Achievers International Scholarships All N N
The Dean’s International Postgraduate Research Scholarships+ Faculty of Science N Y
New Colombo Plan Scholarships Faculty of Science Y N
University of Sydney International Scholarships (UISIS) All N N
Vietnamese Scholarships (nominated via VIEO)^ All N Y
Brazil Scholarship - Science Without Borders (SWB)^ All N Y

* Offered by the University of Sydney
+ Offered by the Commonwealth/Australian Government
^ Offered by an international funding body/government

For the complete list of scholarship opportunities please check the websites.

Sydney research students join a community among the top 1% of research universities in the world, producing groundbreaking work across a wide range of disciplines.
H ow to Apply

To be eligible for admission to a higher degree by research in the natural sciences, you need to have undertaken a significant project or thesis in your previous university level studies. Examples include the equivalent of an Australian honours degree, a masters by research degree, or a masters by coursework degree with a thesis component.

**Application Deadline**

Domestic students apply directly to the University following the steps below, while international students can either apply directly to the University following the steps below or apply through a University representative (agent).

Applying for entry into a research degree requires some time and preparation. You need to take the following steps to apply:

1. **Identify and Establish an Academic Contact/ Potential Supervisor**
   - Firstly you need to contact a suitable member of the academic staff of the University and present them with an initial proposal outlining your proposed topic of research. If you need help, use our Research Supervisor Connect tool at [http://sydney.edu.au/research-opportunities.shtml](http://sydney.edu.au/research-opportunities.shtml).

When you contact a member of the academic staff, you should provide them with some initial details to help them advise you on your study plans. For example, you could outline your educational background, relevant work experience and the research area you are interested in pursuing.

2. **Develop and Submit an Initial Research Proposal**
   - Once you have initiated discussions with an academic contact, you should prepare an initial research proposal. Your proposal should be around 2-4 pages in length and be developed in conjunction with your potential academic supervisor.

   Your initial proposal should include the following information:
   - **Title**: Working title for the project.
   - **Academic staff contact**: Name(s) of the academic staff with whom you have discussed your proposal and, if relevant, a potential supervisor.
   - **Area**: The subject area of your proposed research.
   - **Objectives**: What aims does the work have?
   - **Synopsis**: Briefly describe the key aspects of what you will be investigating.
   - **Background**: Describe what research has already been done in relation to your topic.
   - **Significance**: Why is the topic important?
   - **Methodology**: Approach or methodology to be used in the research.
   - **Resources**: Provide details of the resources required for you to carry out your research project.
   - **Work plan**: An initial plan for completion with annual milestones.

3. **Revise and Finalise Your Research Proposal**
   - In conjunction with your academic contact(s), refine your research proposal ready for submission of your formal application.

4. **Identify and Contact Two Academic Referees**
   - To support your application, we will need to receive references from two academic referees who are familiar with your previous academic qualifications/achievements. Ensure they are available and willing to complete a reference for you, and acquire their correct and current contact details.

   They will need to complete the academic referee report and submit it to the University. Instructions are provided within your online application.

5. **Complete the Application Form**
   - All research applications are made online through the ‘Find a course’ database at sydney.edu.au/courses.
   - For PhD applications, go to the Doctor of Philosophy (PhD) page sydney.edu.au/courses/phd/Doctor-of-Philosophy-phd and pick your faculty. Click the ‘apply now’ button and follow the instructions precisely.
   - For all other research applications, go to the ‘Find a course’ website and search for your research course. Click the ‘apply now’ button and follow the instructions precisely.

To ensure that your application is complete and can be processed as quickly as possible, please ensure you have included all of the required supporting documentation.

If you are sending a copy of an official document (such as an academic transcript), the copy must be correctly certified by an appropriate authority. More details are available on the application website.

International applicants must include the Application Processing Fee of A$100 (Australian dollars) for your application to be processed. Staff members of the University of Sydney often meet future students at overseas exhibitions and interview programs.

These staff are authorised to waive the application processing fee. Applicants with a fee waiver can upload this with their application.

Some international students are exempt from the fee – see sydney.edu.au/ask-international/fees/fee-waiver.shtml

Please note: Incomplete or ill-prepared applications will take longer to process and may be rejected by the relevant faculty or school. If you have any questions about preparing your application, please contact:

- **Domestic** P 1800 SYD UNI (1800 793 864) sydney.edu.au/ask-domestic
- **International** P 1800 SYD UNI (1800 793 864) (in Australia) +61 2 8627 1444 (outside Australia) sydney.edu.au/ask-international

6. **Submit Your Application**
   - Once you have completed the proposal and had it reviewed by your supervisor, you’re ready to submit your application.