MACQUARIE UNIVERSITY | FACULTY OF SCIENCE

www.physics.mq.edu.au

Department of Physics and Astronomy

BACHELOR OF ADVANCED SCIENCE IN ASTRONOMY AND ASTROPHYSICS

Do you have a talent for Physics and an interest in Astronomy?

The Bachelor of Advanced Science in Astronomy and Astrophysics is an elite degree suitable for gifted and talented physics students with an interest in astronomy. Student numbers are restricted so you will enjoy personal attention from your own academic mentor throughout your degree and special advanced units. Many students will go on to an honours degree by completing a fourth year of study and further postgraduate studies in physics. You will have close interaction with academics from three of Macquarie University's major concentrations of research excellence: Astronomy and Astrophysics, Lasers and Photonics and Quantum Information Science. You will benefit from our close links with the Australian Astronomical Observatory and CSIRO's Division of Astronomy and Space Science, which are both located near campus. You will have the opportunity to use optical and radio telescopes at the University's observatory; participate in research; and gain practical experience working in our leading research laboratories. A summer vacation scholarship and a third year research project are included.

What you study

1st year: lays the foundations in physics and mathematics. You will participate in an accelerated learning program including short courses, seminars, discussions and a literature-based research project in modern astronomy & astrophysics. Other optional units include astronomy, engineering, chemistry, computing and biology.

2nd year: continues studies of astronomy and astrophysics, physics, and mathematics. You can also enrol in units in areas such as photonics, engineering or computing. Students have the opportunity to do a vacation research internship. This will allow you to experience the excitement of working alongside graduate research students, research fellows and academics on a research project within our high-profile astronomy and astrophysics group.

3rd year: you will learn about advanced topics in astrophysics such as stellar evolution, interstellar processes, galactic structure, general relativity and cosmology. You will learn advanced topics including quantum mechanics, electromagnetism, solid state and atomic physics. The program includes seminars and discussions of advanced topics and advanced project work. Additional units may include mathematics, engineering or computing. You will be encouraged to attend research seminars at the Australian Astronomical Observatory and CSIRO Astronomy and Space Science.

The degree requires full-time study over 3 years.

Entry requirements

The Bachelor of Advanced Science in Astronomy and Astrophysics program requires HSC Mathematics Band 4 or equivalent. Higher levels of Physics and Mathematics are strongly recommended. It has one of the highest ATAR cut-offs for a science program in Australia.

Scholarships

Scholarships include: general support, equity, Indigenous students, sport, accommodation or international travel. For more information go to **www.futurestudent.mq.edu.au/undergraduate**

Research degrees

Honours and postgraduate studies in physics and astronomy enhance employment prospects in a world-wide market. Many Bachelor of Advanced Science students will enrol in a one-year honours program after they complete their bachelor degree. This program consists of 50% advanced coursework and 50% research thesis. Scholarships are available for collaborative projects with scientists at the Australian Astronomical Observatory. Research projects vary from year to year. For descriptions of sample projects go to **www.physics.mq.edu.au/undergrad/honours**

Physics and Astronomy at Macquarie University enjoys a high level of international recognition for research excellence. The department hosts the Macquarie University research centre for Astronomy, Astrophysics and Astrophotonics.

Students with a high achievement in the honours program will be well prepared to go on to complete a PhD program at universities throughout the world. Physics and astronomy at Macquarie University offers cutting-edge PhD projects in astronomy and astrophysics; quantum information science; semiconductor and condensed matter physics; photonics; and biophotonics.

Astronomy postgraduates could proceed to a professional Astronomy career in a University/Observatory (in Australia or overseas) or enter industry in roles that require strong analytical skills and independent thinking. The research projects vary from year to year and those currently on offer can be found on the website by following the links at **www.physics.mq.edu.au/research**

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SUGGESTED **PROGRAM OF STUDY**

BACHELOR OF ADVANCED SCIENCE IN ASTRONOMY AND ASTROPHYSICS

Required and recommended units of study: Completion of a minimum of 72 credit points including the following **prescribed** and optional units. This major must be completed as part of a degree. The general requirements for the degree must be satisfied in order to graduate.

	LEVEL		CODE	NAME	CREDIT POINTS SEMESTER 1	CREDIT POINTS SEMESTER 2
100 LEVEL	**Required**		**PHYS188**	**Advanced Physics I**	**1.5**	**1.5**
	Required		**PHYS140**	**Physics IA**	**3**	
	Required		**PHYS143**	**Physics IB**		**3**
	Required	*either*	**MATH135**	**Mathematics IA**	**3**	
		or	**MATH132**	**Mathematics IA (Advanced)**	**3**	
	Required	*either*	**MATH136**	**Mathematics IB**		**3**
		or	**MATH133**	**Mathematics IB (Advanced)**		**3**
	Recommended Additional Units: 3 of the following optional units					
	Optional		ASTR170	Introductory Astronomy	3	
	Optional		ASTR178	Other Worlds: Planets and Planetary Systems		3
	Optional		COMP115	Introduction to Computer Science	3	
	Optional		COMP125	Fundamentals of Computer Science		3
	Optional		ELEC141	Digital Fundamentals	3	
	Optional		STAT170	Introductory Statistics	3	
200 LEVEL	**Required**		**PHYS201**	**Physics IIA**	**3**	
	Required		**PHYS202**	**Physics IIB**		**3**
	Required		**MATH235**	**Mathematics IIA**	**3**	
	Required		**ASTR278**	**Advanced Astronomy**		**3**
	Recommended Additional Units: 3 of the following optional units					
	Optional		PHYS220	Scientific Modelling	3	
	Optional		PHYS246	Advanced Physics II		3
	Optional		MATH236	Mathematics IIB		3
	Optional		COMP225	Algorithms and Data Structures	3	3
	Optional		PHTN221	Introduction to Optical Science and Technology	3	
	Optional		COMP226	Computer Architecture		3
300 LEVEL	**Capstone**		**PHYS388**	**Advanced Physics III**	**1.5**	**1.5**
	Required		**ASTR310**	**Astronomy in Action**		**3**
	Required		**ASTR377**	**Astrophysics I**	**3**	
	Required		**ASTR378**	**General Relativity and Cosmology**		**3**
	Required		**PHYS301**	**Electromagnetism and Quantum Physics**	**3**	
	Recommended Additional Units: 3 of the following optional units					
	Optional		PHYS303	Atomic and Solid State Physics	3	
	Optional		PHYS304	Quantum Physics II		3
	Optional		PHYS306	Optical Physics		3
	Optional		MATH335	Mathematical Methods	3	
	Required		**PLANET UNIT**		**3**	
	Required		**PEOPLE UNIT**		**3**	
	TOTAL CREDIT POINTS REQUIRED FOR THIS DEGREE				**72**	

Academic and administrative enquiries

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Web: **www.physics.mq.edu.au**

CRICOS Provider Number 00002J

Please note: This information is intended as a guide only and does not replace the Macquarie University Handbook of Undergraduate Studies. For full degree requirements you should refer to the Macquarie University Handbook of Undergraduate Studies at **www.handbook.mq.edu.au**
Offerings of units may change from year to year.