

Leiden University Astronomy

- Formation and Evolution of Galaxies: from high redshift to the present
- Birth and Death of Stars: the life cycle of gas and dust
- Astronomy and Science Based Business
- Astronomy and Communication
- Astronomy and Education

Master of Science Programmes

Faculty of Mathematics and Natural Sciences

Astronomy

Introduction to the Leiden Observatory

Leiden Observatory ("Sterrewacht Leiden"), founded in 1633, is the oldest university astronomy department in the world, and the largest astronomy department in the Netherlands. The work of famous astronomers including Professors De Sitter, Hertzsprung, Oort, Blaauw, and Van de Hulst made Leiden an internationally renowned centre of astronomical research. In 1974, the observatory moved from the "old observatory" in the centre of town to a modern building shared with physicists, and close to the departments of mathematics and chemistry.

Leiden Observatory has access to a wide range of first class observational facilities. The observatory presently hosts the Directorate of the Netherlands Research School for Astronomy (NOVA), an association of Dutch university departments that has recently been allocated considerable funding by the Dutch government to carry out a ten-year programme of astrophysical research.

Leiden Observatory is partner in the Lorentz Center, an international research centre for Astronomy, Computer Science, Mathematics and Physics. The Center offers a variety of workshops and courses, which are of great interest for both staff and students. Leiden Observatory has a large network of international collaborations and has a long tradition and an internationally acknowledged reputation for education in astronomy.

The PhD students from Leiden score exceptionally well in obtaining jobs internationally. One of the most prestigious fellowships in world astronomy is NASA's Hubble fellowship. More astronomers with Leiden doctors degrees have won Hubble fellowships than those of any other university outside the USA. Many of the faculty members, PhD students, and undergraduates have an international background. English is the common language. More information can be found on our web site: <http://www.strw.leidenuniv.nl/>.

MSc Programmes

Research in Astronomy

At the Leiden Observatory research and education are focused on two major themes:

- Formation and evolution of galaxies: from high redshift to the present
- Birth and death of stars: the life cycle of gas and dust

The two themes are strongly related, and both observational and theoretical research is carried out in these areas. The range in courses and research programmes is very wide, from cosmology to the solar system.



Universiteit Leiden
The Netherlands

www.leiden.edu



Astronomers at Leiden Observatory have access to the best observational facilities in the world, including the Hubble Space Telescope, ESO's Very Large Telescope, Westerbork Synthesis Radio Telescope, XMM, AXAF, etc. The observatory also hosts the Sackler Laboratory for Astrophysics, where experiments simulate the chemistry of interstellar ices.

Theorists have access to the fastest supercomputers through the Netherlands Center for Supercomputing Facilities (NCF). Many of the students are involved in the analysis of data from these modern facilities. The MSc student will follow courses and perform research in the two areas described above. Dutch as well as foreign students are invited to participate. The language of communication and teaching is English.

Objectives

The programme is intended for students with a recognised education in physics, mathematics, and astronomy at the Bachelors level. The degree obtained will guarantee thorough research experience founded on a firm theoretical basis, and the communicative skills necessary to function on the international scene.

Structure and duration

The strength of the programme is its individual approach; for each student, an individually tailored programme is designed. This programme consists of courses, a small research project, and a Master thesis project. Some students may also participate directly in astronomical observations. In some cases, remedial courses may be prescribed to remedy deficiencies in a student's prior education. The duration of the programme is 2 years. Students can enter the programme in September and January.

A typical MSc programme consists of:

- A number of advanced courses (lectures and instructions) in subdisciplines related to the MSc specialisation
- A MSc Thesis research project of about 1 year (including training in presentations and writing of the thesis)
- A minor project (about six months halftime) in a different research area

Astronomy and Science Based Business

The MSc programme Astronomy and Science Based Business prepares students for a career in science-related business and administration and for innovation and enterprise from an astronomy perspective.

In addition to experience in astronomy research, students obtain competence with respect to organisations, people in organisations, and establishment and management of processes. Students with an MSc in Astronomy and Science Based Business are also eligible for a PhD programme. This programme consists of one year training in the field of astronomy and one year of business related courses and projects.

Astronomy and Communication

The MSc programme Astronomy and Communication prepares students for a career in science communication and popularisation. The programme consists of courses, practical work, research and a Master thesis project. Please note that this programme, in contrast to the Research and Science Based Business programmes, (presently) requires proof of thorough proficiency in spoken and written Dutch.

Astronomy and Education

The MSc programme Astronomy and Education prepares students for a career in teaching Astronomy. The strength of the programme is its individual approach; for each student, an individually tailored programme will be designed. The programme consists of courses, practical work, research and a Master thesis project. Please note that this programme, in contrast to the Research and Science Based Business programmes, requires proof of thorough proficiency in spoken and written Dutch.

Depending on the student's academic background, compulsory courses may be required. Students can enter the programme in September and January.

Degree

Students who complete the programme will receive the degree of Master of Science (MSc) in Astronomy, with specification of the specialisation, if applicable.

PhD Programme

All those who have obtained an MSc, or its equivalent, may apply to enter the Leiden PhD programme in which the candidate carries out a programme of independent research and some course work, culminating in a PhD thesis after typically four years. Throughout the year the Leiden Observatory has paid positions available for PhD students that are filled on a merit basis. In addition it may be possible to enter the PhD programme on the base of self-obtained grants. The specific requirements of the PhD course are determined





in agreement with NOVA, the Netherlands Research School in Astronomy. In some cases the PhD project will be a continuation of the MSc research project.

Qualifications for Applications

To qualify for the MSc in Astronomy programme, applicants should:

- have completed a BSc degree (or equivalent) in Astronomy, or Physics with preferably an Astronomy major. Exceptionally good students from related areas may also be accepted. The students should have obtained high grades at a recognised university (preferably 75% of the scale maximum or higher).
- be proficient in written and spoken English.

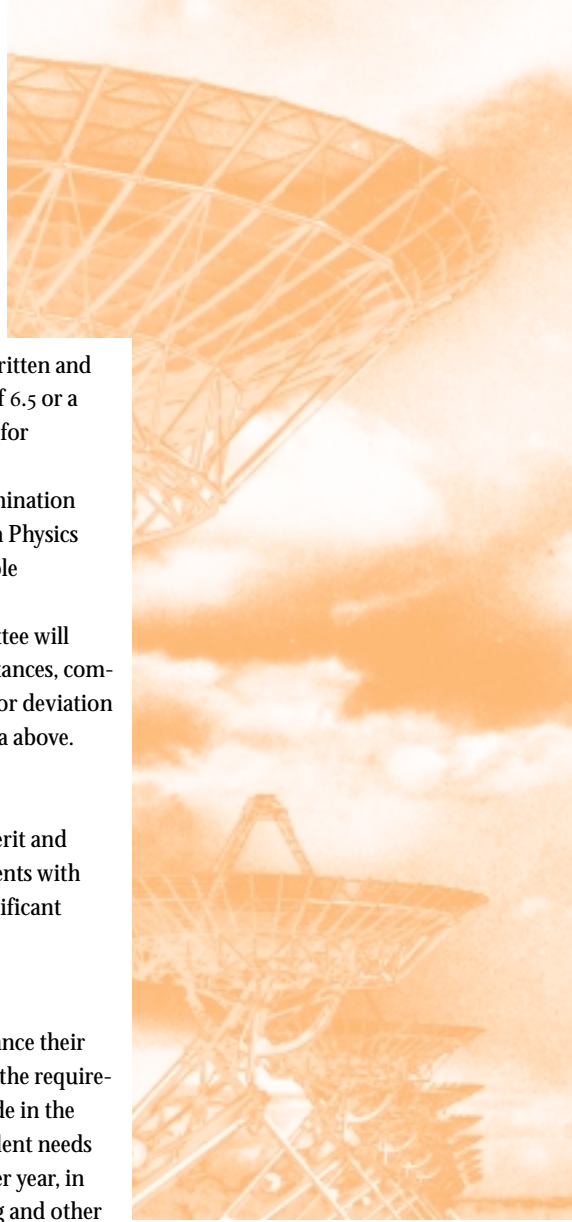
Registration and Application

Application forms are available at www.leiden.edu or will be mailed upon request.

For courses starting in September, the deadline for returning the application form and the required documentation is April 1. For courses starting in January, the deadline is July 1. Registration after these dates may lead to a delay in processing of the application. Early applications are encouraged and will be processed in the order of arrival.

Applications should include:

- a completed application form
- certified copies of university certificates, including copies of all academic records of all courses you have taken at every institute of higher education you have attended. Translations into English are required.
- a copy of your thesis or final assignment of your BSc study and state credits, grade and workload (in hours spent on this project). In case the final assignment has not yet been finished, give an indication of its contents and date of completion.
- a curriculum vitae
- a personal statement of motivation to participate in the MSc course and the chosen sub-area
- two letters of recommendation from academic staff members



- a proof of a thorough proficiency in written and spoken English, e.g. by a IELTS score of 6.5 or a TOEFL score of 570/230 or equivalent (for non-native English speakers)
- scores from the Graduate Record Examination (GRE) General Test and Subject Test in Physics
- proof of payment of the non-refundable application fee of € 50

In individual cases, the selection committee will decide whether any exceptional circumstances, compensations or alternatives should allow for deviation from one or more of the selection criteria above.

Scholarships

Partial scholarships are available on a merit and demonstrated financial need basis. Students with EU/EEA citizenship are entitled to a significant reduction of the tuition fee.

Financing

Prospective students must be able to finance their study and living expenses. This is one of the requirements for being granted a permit to reside in the Netherlands. As a guideline, a single student needs approximately of € 9,500-10,000 Euro per year, in addition to the tuition fee, to cover living and other expenses.

Orientation Programme

At the beginning of the course of studies an orientation programme will be offered to newcomers. This two-day programme consists of a general introduction to the university, the city of Leiden and the various student organisations. Leiden University students will act as guides and introduce their international peers to the academic, social and sports facilities.

General information

Degree	Master of Science in Astronomy
Programme duration	2 years
Start and end date	September-August or January-December
Fees	Tuition fee € 11,000 per year Non refundable application fee € 50 Non-refundable placement fee € 500, counted towards tuition Fees are for 2004-2005 and subject to annual change
Language of instruction	English
Application deadline	April 1st or July 1st
Entry requirements	BSc degree in Astronomy or Physics with an Astronomy major. Results GRE general test and GRE Subject test in Physics IELTS 6.5 or TOEFL 570/230 for non-native English speakers



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Information and Application

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