GENEVA OBSERVATORY

The Geneva Observatory was founded in 1772 by Jacques André Mallet and is the department of Astronomy of the University of Geneva. It is located since 1966 at Sauverny, where approximately 75 of its collaborators work. The Laboratory of Astrophysics of the Federal Institute of Technology of Lausanne (EPFL) also employs 15 people at the same site.

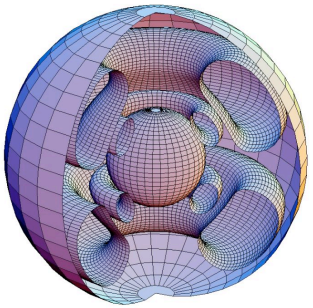
Scientists, engineers, data processing specialists, technicians, administrative staff, post-graduates and students work in the building of Sauverny which houses their offices, workshops, engineering and design departments, a data-processing centre, a library, a cafeteria and exhibition rooms.

The ISDC (Integral Science Data Centre), established in 1995 at Ecogia some 3 km from Sauverny, is attached to the Geneva Observatory. Approximately 30 people are entrusted there with the reduction of the data transmitted by the INTEGRAL satellite of the European Space Agency (ESA) and their subsequent distribution to the users. This satellite observes in the *gamma* wavelength region of the electromagnetic spectrum. It was successfully placed in orbit on October 17, 2002.

The European Observatory of La Silla in Chile

Our measurements are obtained essentially at the observatories of La Silla and Paranal in Chile, La Palma in the Canary Islands, and the Haute-Provence in France, as well as aboard several astronomical satellites. Other telescopes have also been used, such as those at the Jungfraujoch and Gornergrat high-altitude stations in the Swiss Alps. The two domes in Sauverny allow technical work, such as the assembly and the development of instruments destined to be installed in our remote stations. The telescopes are also used for the training of students and public observations.

Our scientific research is oriented toward several important aspects of contemporary astrophysics: extra-solar planets, stellar evolution and stellar nucleosynthesis, stellar physics and seismology, galactic dynamics and evolution, quasars and high-energy sources (Gamma-Ray Bursts, for example), deep universe and gravitational lenses. These activities require the development of up-to-date instrumentation installed on ground-based telescopes or in spacecraft. The availability of research and development laboratories which stand in permanent association with the researchers are essential to that end.



Computer generated rotating star model

The scientific and technical competences of the Geneva Observatory researchers are internationally recognized. Notable achievements in spectroscopy and high precision photometry are quoted repeatedly in the literature. We may mention the HARPS correlation spectrometer presently installed on the 3.6 m telescope at La Silla. It is dedicated to the search for new extra-solar planets. This instrument is currently (2006) the most powerful of its kind in the world and has already began its harvest of discoveries.

International collaboration is one of the primary driving forces of research programmes in astrophysics. The Geneva Observatory actively participated in the HIPPARCOS space mission (photometry and astrometry) and collaborates in the most active possible way, via its ISDC centre, with the INTEGRAL mission (*gamma* radiation). Part of our activity also extends to other space missions, such as COROT (seismology and planetary transits), GAIA (astrometry and photometry), PLANCK (cosmology) and SIM (interferometry).

We also take part in the development of instruments for the giant ground-based telescopes, essentially via ESO (European Southern Observatory). The construction of HARPS, quoted above, and the participation in GIRAFFE (multi-objects spectrograph) and PRIMA (micro-arcsecond Astrometry) for the VLT (Very Large Telescope) are such examples.

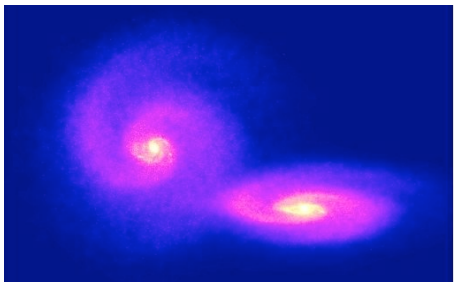
The 120 cm telescope of the Geneva Observatory at La Silla

We have built two 1.2 m telescopes in collaboration with the Belgian University of Leuven, which were installed in Chile in 1998 and the Canaries in 2001. These telescopes, named EULER and MERCATOR, respectively, are equipped with instruments (spectrograph, photometer or CCD cameras) entirely designed, built and installed by our scientists, engineers and technicians.

The groups of theoretical astrophysics master the complex physics of stars, galaxies and the interstellar medium. They compute models of stars and galaxies which attempt to reproduce their observed properties as well as possible. This interaction between theory and observations is essential to understand the structure and evolution of the Universe and its contents. GRAVITOR and LUXOR, arrays of computers working in parallel, were developed to make these simulations even more powerful.

Each year, more than hundred theoretical or observational articles are published in international journals or works. Among the recent events, one may note:

- The solution of the enigma of the torsion of galaxies, found thanks to digital simulations carried out using the LUXOR supercomputer.
- Handing-over of the annual Prize of the Shaw Foundation to Prof. Michel Mayor "for having first discovered and characterized the orbits and masses of planets belonging to other stars" (press release of June 9, 2005).
- The seismological study of the stellar binary system α Centauri made it possible to derive the basic physical parameters of both components (masses, radii, age) with exceptional precision (approximately 3% on the radii).
- The discovery of a neutron star so well hidden in interstellar dust that four space telescopes were needed to identify it (press release of July 14, 2005).



Simulation of a collision of spiral galaxies

Apart from teaching at the university level, the Geneva Observatory's scientists give many public lectures and take part in various courses of continuous training. In addition, we accommodate approximately 1500 people per annum for visits or public observations, and a yearly *general public course of astronomy* is given, as for the last 30 years, at the Faculty of Sciences. Finally, we announce that the "*Conférences publiques d'astronomie UniGE-EPFL*", started in 2005, will also be held in 2006, on May 3 in Lausanne and on May 4 in Geneva, on the topic "the 1000 years of the Supernova".

We hope you will find the answers to any astronomical questions you may have on our Web site:

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