1998AfrSk...2...22B

Observatoire Midi-Pyrénées[1]

Michel Blanc[2] & Monique Querci

Observatoire Midi-Pyrénées, 14, Av. E. Belin, Toulouse, France
phone: 33 5 61 33 28 78 - fax: 33 5 61 33 28 40
e-mail: querci@astro.obs-mip.fr

(OMP Website at: http://www.obs-mip.fr)

1 Introduction

The Observatoire Midi-Pyrénées (OMP), mainly located in Toulouse (Fig.1), is a multi-disciplinary institute for the study of the space sciences through the use of ground- and space-based technologies. Through its Research Units and its Observing Services, the Midi-Pyrénées Observatory is active in the areas of Astronomy-Astrophysics, Oceans-Atmospheres, and Earth Sciences. OMP also works closely with universities to promote the teaching of these disciplines. The courses are mainly presented in French.

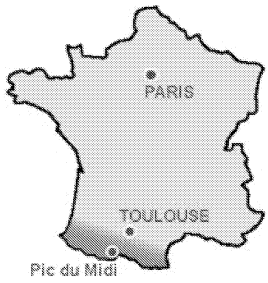


Figure 1: Location of Toulouse, about 800 km from Paris, and of the Pic-du-Midi summit in the Pyrénées Mountains (courtesy by M. Montagne, OMP).

[1]Detailed documentation on OMP, in French or English, may be obtained from Monique Querci.
[2]Director of OMP.

2 Astronomy and Astrophysics

2.1 Astrophysical Laboratory of Toulouse

The laboratory is structured around the following main themes:
- theoretical astrophysics and fluid mechanics,
- planetology, with observations of Mars, Jupiter and Saturn,
- solar physics, with analysis of phenomena in the photosphere and the corona,
- stellar physics, with the study of globular clusters,
- analysis of the variability of red giant stars and measurements of solar and stellar magnetic fields,
- extragalactic physics and observational cosmology, and analysis of irregular giant galaxies,
- the study of spectroscopic binary stars,
- the history of Greek and Arab astronomy.

The research workers and engineers at OMP often supervise students on training courses from various different disciplines (engineering schools and technical universities) and levels (masters and doctoral degrees). Some of the teams are heavily involved in two of the major astronomical projects of the year 2000: (i) participation in the construction of the instrumentation and in the programmes of ESO's Very Large Telescope in the interferometric mode, and (ii) very high-level international responsibility in coordinating the scientific programs of the Huygens-Cassini probe and exploring the satellite Titan.

Researchers also work in the Pic-du-Midi Research Centre to make observations using the instruments installed on the Pic-du-Midi summit (altitude 2880 m).

© Working Group on Space Sciences in Africa • Provided by the NASA Astrophysics Data System

1998AfrSk...2...22B

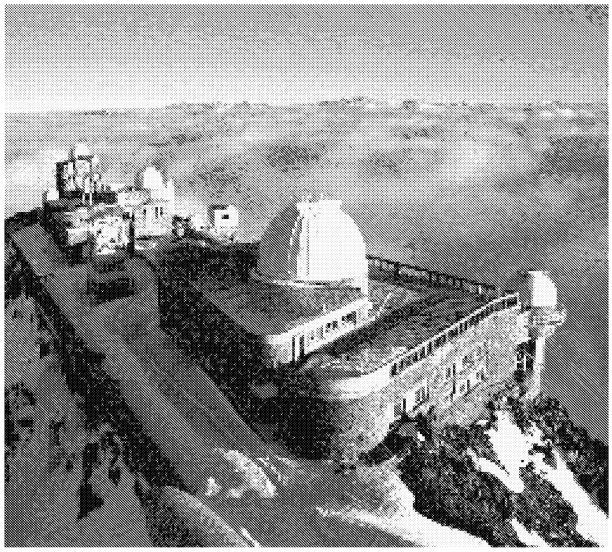


Figure 2: The Pic-du-Midi station at 2880-m altitude (courtesy by M. Montagne, OMP).

2.2 The Pic-du-Midi Observatory

The Pic-du-Midi Observatory (Fig.2), founded around 1880 by General Champion du Bois de Nansouty and an engineer named Vaussenat, began life as a meteorological station. It was only in the early 20th century that, through the impetus given by Benjamin Baillaud, astronomical observations were begun, the first dome constructed being 9 m in diameter.

The observatory's history is marked by important milestones such as the implementation of the first coronograph by Bernard Lyot in the 1930s, immediately followed by the beginning of systematic observations of the Sun's corona, then by the first high-resolution photographs of planets by B. Lyot and H. Camichel.

After the second world war, and under the direction of J. Rösch from 1947 to 1981, the Pic-du-Midi became a large mountain observatory with the installation of cosmic radiation detectors in 1949, the construction of the 50-cm solar refractor and the turret-dome in 1959, the 105-cm telescope in 1963 for lunar mapping requested by NASA for the moon landings, and finally the 2-m *Bernard Lyot* telescope, which was completed in 1980.

The Observatory was an institute of Toulouse University's Science Faculty until 1969. Since 1988, it has built up a large geophysical component with a large permanent station measuring ozone in the atmosphere.

In order to promote a culture of science and technology, during the summer season the Observatory hosts approximately 25,000 visitors, attracted by the beauty of the panoramic view and the site's reputation. A large cultural project is planned for the near future.

3 Oceans & Atmospheres

3.1 Aerology Laboratory

The Aerology Laboratory studies the different physical, dynamical and physico-chemical processes in the troposphere (0–10 km) and in the superficial ocean. These processes occur at scales smaller than the mesh of climatic models (a few hundred kilometres). This work is based on three-dimensional numerical modelling and field experiments.

As a university laboratory, the Aerology Laboratory participates actively in teaching Earth Sciences to honours and post-graduate students. The laboratory is located at two sites: Toulouse and Lannemezan.

3.2 Oceanography and Geodesy Laboratory

Space geodesy, and physical and chemical oceanography are the major fields of interest of this laboratory. As a joint CNES-CNRS science group, the laboratory intends proposing new Earth observation experiments from space, to participate to the design of such experiments, and to use the resulting data to achieve scientific goals in oceanography and geodesy. Satellite tracking, positioning and altimeter data are essential for the various activities of the group.

As far as geochemistry is concerned, the carbon and trace element cycles in the oceans are the main research fields.

3.3 Centre de Topographie des Oceans

The Centre de Topographie des Oceans constitutes a technical and scientific centre for the earth/space observational data processing, as far as space altimetry is concerned. It plays a major role in stimulating the discipline of dynamical oceanography as a laboratory science in French and European communities. The Centre has adapted long-term data management procedures which allow improvements of data sets and creation of new high-level scientific products following the evolution of this science.

In the general context of oceanography, this Centre has to be considered as the natural complement of other centres specialising in temperature, wind or flux data collection.

© Working Group on Space Sciences in Africa • Provided by the NASA Astrophysics Data System

1998AfrSk...2...22B

4 Earth Sciences

4.1 Terrestrial and Planetary Dynamics

The Laboratory's scientific activities cover two distinct fields: internal geophysics and planetology. Their focus is the study of the Earth and planets from a global perspective, mainly by using the techniques and methods of space geodesy.

In internal geophysics the main themes dealt with are: space geodesy, convection in the earth's mantle, the deep structure of the Earth and the mechanisms of continental erosion.

In planetology, research concerns the dynamics of the solar system, the internal structure of telluric planets and the study of their surface composition by spectral analysis of the reflected solar light. The space missions in which the laboratory has participated to date are: *Lageos, Seasat, Geosat, Starlette, Pioneer, Viking, Phobos, Doris* and *Magellan.* The currently active or anticipated missions are: *Stella, ERS1, Topex Posidon, Galileo, Mars Observer, Cassini.*

4.2 Geochemistry

The main scientific goal of this team is the application of chemical methods (thermodynamics, kinetics, trace element and isotope chemistry) to understand and model the formation and evolution of terrestrial materials at different scales both in time and space.

4.3 The Pyrenean Seismological Network

This seismic network was installed to monitor and understand Pyrenean seismic phenomena: twenty autonomous stations measure the ground movements and transmit this information *via* the Meteosat satellite to the headquarters in Toulouse, where it is recorded by a direct read-out station.

4.4 Bureau Gravimétrique International

The Bureau Gravimétrique International (BGI) is one of the offices of the Federation of Astronomical and Geophysical Services (FAGS). It was created in 1951 by the International Association of Geodesy (IAG), with the main purpose of collecting, on a worldwide basis, all gravity measurements and pertinent information about the gravity field of the Earth. BGI has been located in Toulouse since 1980.

It is supported by five national organisations:
- the Centre National d'Etudes Spatiales (CNES),
- the Centre National de la Recherche Scientifique (CNRS),
- the Institut Géographique National (IGN),
- the Bureau de Recherches Géologiques et Minières (BRGM),
- and the Institut National des Sciences de l'Univers (INSU, an institute of the CNRS).

Sommaire

L'Observatoire Midi-Pyrénées a pour vocation de faire des recherches et de diffuser les connaissances dans un large domaine des Sciences de l'Univers à la fois par des moyens au sol et dans l'espace. A travers ses Unités de Recherche et ses Services d'Observation, l'Observatoire Midi-Pyrénées est actif dans trois secteurs des Sciences de l'Univers : Astronomie-Astrophysique, Océan-Atmosphère, Sciences de la Terre. Il œuvre également au sein de l'Université pour promouvoir l'enseignement de ces disciplines. Les cours étant donnés évidemment en Français, il est principalement ouvert aux étudiants Africains francophones, bien que les scientifiques parlent Anglais.

Une documentation détaillée, soit en Anglais, soit en Français, peut être obtenue auprès de Monique Querci.

© Working Group on Space Sciences in Africa • Provided by the NASA Astrophysics Data System