

ASTROWATCH: ITALY

Edited by Emma Sanders

Astrowatch turns its gaze to Italy, a country where astronomy research has been growing in popularity remarkably fast.

Italian astronomy enters new era

Astronomers in Italy will soon have a new coordinating body – the National Institute of Astrophysics – to regroup the 12 national observatories and strengthen ties with university astronomy departments and the 8 astronomical research institutes of the National Research Council.

The National Institute of Astrophysics (INAF) will be based on the successful organization of nuclear physics research within the INFN. The new administration looks set to bring together new collaborations.

“Any individual establishment was not really in a position to have dialogue with the INFN,” said Franco Pacini (director of the Arcetri observatory and president-elect of the International Astronomical Union), who is very much in favour of the new arrangement. “Both communities will now profit.”

Pacini identified instrumentation as one of the areas where collaboration could be beneficial. “Although classical astrophysics, with all kinds of instruments, is still providing the main ground for understanding the universe

[the existence of dark matter was proven by observational astronomers], gravitational waves and particle astrophysics will become very important in the coming decades. Astronomers know better what’s around us; physicists are much more sophisticated in their experiments. With more interactions and joint ventures, INAF and INFN will benefit from each other.”

The INAF president and board will be selected before the end of the year and will become operational within about six months.

Galileo telescope

Galileo, the new 3.5 m Italian national telescope, will soon be open to astronomers. Situated on the Roque de los Muchachos Observatory in the Canary Islands at an altitude of 2400 m, its prestigious neighbours include the UK-Dutch Isaac Newton telescopes and the Nordic Optical telescope. Galileo saw first light in 1998. Operational problems with its controls are now resolved.

Picture of the month



Italy has two 32 m radio telescopes, this one in Noto, Sicily, and another in Medicina. They will form part of the worldwide Very Long Baseline Interferometry network of radio telescopes. A 64 m radio telescope is planned for Sardinia. (IRA, Noto.)

VIRGO advances at Pisa

When Galileo dropped cannon balls from the top of the leaning tower of Pisa early in the 17th century, he demonstrated that all bodies fall with equal acceleration. It is fitting, therefore, that Pisa will be the home of a remarkable new gravity experiment – VIRGO.

Einstein predicted the existence of gravitational waves, which are generated by perturbations in space-time. Examples of strong sources of gravitational waves include supernova explosions, binary star systems, interacting black holes and even the Big Bang. The weakness of the force of gravity makes it extremely difficult to detect gravitational waves. Astronomers only have indirect proof of their existence from observations of orbiting neutron stars.

VIRGO will attempt to make direct measurements of these gravitational waves.

The experiment will consist of a laser interferometer with two 3 km perpendicular arms. As gravitational waves distort space-time along perpendicular directions, the waves will either lengthen or shorten the arms of the interferometer and this will show up when the laser beams are recombined.

Incredible accuracy is required; VIRGO will use the first of a new generation of ultrastable lasers and the mirror surfaces will be accurate to one hundredth of a micrometre. The mirrors will be suspended on a system of five pendula to eliminate seismic noise.

VIRGO is a collaboration between France and Italy. The facility is due to open in 2001. A similar project, called LIGO, is being built in the US, and other groups are working on cryogenic resonant bar detectors for gravitational waves (*CERN Courier* March p10).

Double vision aids high resolution

The largest telescope in the northern hemisphere will be the Large Binocular Telescope (an optical infrared interferometer) at Mount Graham in Arizona. It will have two 8.4 m primary mirrors (mounted on the same support structure), which will give a light-collecting area equivalent to that of a 12 m telescope. The design is different from other large telescopes and astronomers are looking forward to interesting high-resolution studies.

The European Southern Observatories' Very

Large Telescope (VLT) is an interferometer with four telescopes (*CERN Courier* April p11). Its resolution will be 5 times as great as that of the Large Binocular Telescope (LBT). However, more signal will be lost through the complicated VLT optics, so the LBT will be able to observe much fainter objects.

The mechanical structures of both telescopes are being built in Italy by Ansaldo. The US and Germany are collaborating in the LBT project. Commissioning should finish by 2003.