

Extensive technological research activity in the field of x-ray space astrophysics is carried out at the Palermo Observatory. The observational and experimental research core started in the 80's, in the following decade led to the building of the XATC (X-ray Astronomy Calibration and Testing) Laboratory, aimed at calibrating optical systems and detectors, before their utilization on board international satellites for high-energy astrophysics missions. The space observatories Chandra and XMM Newton are some of the projects in which the XACT facility has been engaged.

In the late 90's the field of technological activities was extended, with the development and use of optical spectrometric equipment for ground telescopes. A fund allocated by the Sicilian regional government enabled the realization of a joint technological program for the construction of the X-SHOOTER spectrograph for ESO (European Southern Observatories) Very Large Telescope (VLT).

Researchers also take part, sometimes holding high responsible roles, in international programs for the development of new generation space telescopes for X-ray astrophysics (Symbol-X, XEUS, XIAO), for extra-solar planets search (PLATO) and for the study of the solar outer atmosphere (Solar Orbiter).

Moreover, the OAPa has a longtime-running interest in high performance com-

puting, meant as a tool to ease the development of numerical models for the study of astrophysical plasma, that is the highly ionized gas very commonly found in space objects. The models devised are magnetohydrodynamic and are applicable to the hot plasma of Sun-like stars coronae, matter ejections and flows associated to protostellar objects, novae and supernovae remnants.

In 2000, owing to the increasing complexity of these studies, a Computing System for Numerical Astrophysics (SCAN), employing powerful supercomputing hardware, has been activated with specific allocations from the Ministry of Education, Research and University (MIUR) and the Regional Government of Sicily.

In addition, INAF-OAPa has recently participated in the PI2S2 Project, set up to implement and develop an e-infrastructure in Sicily based on the GRID paradigm, with funds granted by the PON-MIUR (Ministry of Education, University and Research) to the COMETA Consortium, to which INAF contributes by means of its research facilities in Sicily.

Most recently OAPa has been engaged in the field of experimental astrobiology. This activity is aimed to understanding the role and effects of high-energy stellar radiation in the formation and evolution of life-originating compounds, through controlled laboratory experiments.



*The high-vacuum tube at the XACT laboratory*



# TECHNOLOGY