

## FOREWORD

There are many reasons behind the decision of publishing an Annual Report, but the reason we consider more relevant is that we strongly believe that any public institution should allow everybody to know the results of its activity. Of course the research work of the University Departments and of the National Institute of Nuclear Physics (INFN) is judged and ranked by national and international referees, and part of the financing is related to their judgments. This Annual Report is not addressed to these referees. On the opposite, we want to give a picture of the work done in the year 2008 by the Physics Department of the University of Salento and by the Lecce Division of the INFN which can be consulted by all the interested people.

Here in Lecce, the activities of the Physics Department and of the local INFN division are so strictly linked that it is very difficult to disentangle them. The INFN division is hosted in the same buildings as the Physics Department, and both organize and manage together several services which are used by all the staff members and by the students, as the computer and networks systems, the electronics laboratory and the mechanical workshop. The collaboration between Department and INFN is very strong and we act to increase it since we believe that both institutions benefit from this relationship.

Coming to the 2008 scientific activity, which is the subject of this Annual Report, we think that the most important event of the year has been the start up of the Large Hadron Collider (LHC) at CERN. In Lecce, a group of 14 physicists is involved in the final tuning of the ATLAS detector, with responsibilities in the detector performance measurement, software analysis tools development and physics analysis.

The astroparticle group is involved in two experiments which are producing results in various fields of physics as  $\gamma$ -astronomy, ultra-high energy cosmic ray spectrum and proton-proton cross-section measurements.

Some of the high-energy physics researchers are also involved in the development of new detectors and experiments and of software tools for medical diagnostics.

Astrophysics sees the presence of three different lines of research going from planetology, tackled mainly with laboratory studies and space missions (Mars-Venus Express, Rosetta and Exomars), to interstellar medium and stellar formation research made with Earth based telescope and space observations (Spitzer/NASA, Herschel/ESA), to theoretical astrophysics dealing with Dark Matter and relativistic astrophysics.

Since some year, the great experience of the condensed matter group in working with high-power LASER beams, is used in various interdisciplinary fields, from the care of our cultural heritage, to medicine, to atmospheric aerosols studies and to the production of new materials for photonics, optoelectronics and photocathodes for accelerators.

Because of structural differences, the theoretical activity is more difficult to classify. This activity is more related to individuals than to groups. The results obtained in various fields going from

astrophysics to foundations and history of physics, through elementary particle, nuclear, statistical, mathematical and non-linear physics, are of evident international prestige, as the publications indicate. We observed a positive tendency to collaborate on common projects, and to interact with the local experimentalists.

Finally we would like to point out the the outreach events organized by by the INFN and the Department. Together with the traditional activity of organizing prestigious international conferences and workshop, the two institutions have started to develop a program aimed to present their scientific activity to non experts and to the schools. Probably the most spectacular event of the 2008 has been the *Notte dei Ricercatori*, the night of the researchers. On Sept. the 26th from 8 p.m. to 1 a.m. all the physics labs remained opened to the public. At the same time in the campus where the Department is located, a set of shows took place. Music concerts of chorus, of folk, rock and jazz bands, theater and dancing shows have been presented. This event required an enormous organization effort, but it payed back with a large participation of the populations. We would like to thank all the people which have been involved in this event.

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