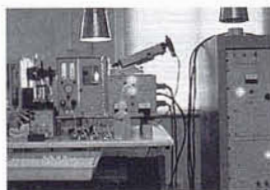


PHYSICS IN CATALONIA



THE LAST THREE YEARS HAVE SEEN THE CREATION OF A NEW HIGH ENERGY EXPERIMENTAL CENTRE, A NEW NATIONAL MICRO-ELECTRONICS CENTRE AND A SCIENCE OF MATERIALS CENTRE IN BARCELONA. THESE EXAMPLES ARE THE TIP OF THE ICEBERG AS REGARDS THE LABORATORIES SCATTERED AROUND FACULTIES AND UNIVERSITY COLLEGES, WHOSE AIM IS THE STUDY OF THE APPLICABILITY OF PHYSICAL PROPERTIES.



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To understand the situation of Physics in Catalonia, we must first make a brief retrospective analysis of the development of physics in our country over the last twenty-five years.

A quick look at the sort of investigation that was going on at the beginning of the sixties shows that the only branch of physics of any importance was that which dealt with the theoretical study of the problems and the phenomena related to the basic constituents of matter, that is to say, elementary particles.

This isolated success in theoretical physics came about as a result of two important factors. On the one hand, it was the first field of investigation in which people realised how important it was for the development of research that scientists should visit more advanced countries to complete their training. At the same time, it was relatively easy to introduce approaches and working methods picked up abroad, given the shortcomings here of the infrastructure needed for the development of ideas.

The end of the sixties and the beginning of the seventies witnessed the first complete break with the past, as a result of the large numbers of scientists working in different fields of physics who went abroad, and the increased willingness to introduce experimental research into our country. During this period, theoretical physics not only gained ground and steadily improved its approach to the problems it dealt with, but it also encompassed other subjects such as nuclear physics, the application of the N-body theory, the emergence of successful statistical physics teams, etc. In the field of experimental physics, in spite of the growing numbers of researchers who studied abroad, their return was made difficult by an outdated and inflexible university structure.

The second breakthrough in physics came at the end of the seventies and the beginning of the eighties, with the consolidation of different research teams in dif-

ferent areas of physics. This consolidation owes a great deal to the scientific policies carried out by the responsible organisms. The field of experimental physics is where this internal revolution has been most keenly felt. As one might expect, the early years of experimental research were marked by the acquisition of new equipment intended for characterization studies of materials from abroad, using a range of spectroscopic techniques or by studying magnetic, thermal, electrical properties, etc., so as to discover the inherent properties of these materials and to study their response to external agents. At the same time, there were important advances in research into the physics of the earth and the cosmos, especially in the field of astrophysics.

The success in the development of physics in our country during this last period has led to new insights which have succeeded each other at a remarkable rate over the last two or three years. The importance of the work done by theoretical physicists has favoured the creation of a new High Energy Experimental Centre, an important bridge linking theoretical advances with experimental results. In the field of experimental physics, the maturity of the research teams in our country has led many of them to look for funds in collaborations outside the university sphere. An indication of the wish to move closer to the world of applied science can be seen in the creation of a new National Centre for Micro-electronics, where the original university approach, involving the characterization of elemental electronic devices, has given way to the idea of producing devices with technological applications; or the also recent creation of the Barcelona Institute for the Science of Materials, where fundamental research must of necessity be linked to topics that have a direct bearing on its applications. These two examples are no more than the tip of the present iceberg: there are many laboratories scattered around faculties and university colleges where similar work is

going on. As can be seen, there has been progress from an initial phase, which was principally concerned with the observation of physical properties, to a later phase consisting of research into the potential applications of these properties. However, there are still two questions to be settled. One concerns the provision of an infrastructure in our country which would allow us to obtain the materials to be studied. There has been progress in this area recently, although there is still a long way to go. The other question deals with the addition of new characterization techniques to the already existing range. Physics in this country is still a long way from the levels it reaches in other, more advanced countries, though the ground covered should not be underestimated. It is not unusual to find articles on research written by our scientists in leading international magazines; our investigators make frequent visits to research centres abroad, investigators from all over the world come to our country, and our research teams regularly take part in international projects. I feel the moment has come when physicists are aware of the seriousness with which research projects are tackled, a fact which makes for absolute faith in the future. One of the challenges at present facing physics is that of going beyond its strict limits and making itself felt in other spheres such as biophysics and thermodynamics in general, the physical chemistry of surfaces (neglected in our country up till now), instrumentation, etc., without forgetting the work of training qualified scientific staff to take over specific jobs in society, such as the training of technicians in radiation physics and nuclear physics, in which the universities have considerable experience. Looking back over the last few years, one can say that physics in Catalonia has progressed from a state of total abandonment in the fifties to one of modest but solid maturity at present, which gives cause for optimism in the immediate future. ●