

» SPOTLIGHT



**PARTICLES FOR HEALTH:
 THE CATANA CENTRE
 REOPENS IN SICILY.**

CATANA, the only Italian centre for the treatment of ocular melanoma with adrotherapy and one of very few in Europe, has reopened for a new cycle of treatment using proton beams accelerated by a superconducting cyclotron. The centre is reopening after a period lasting about one year that made it possible to perform maintenance and upgrading operations, including a complete overhaul of the accelerator's cryogenic system.

Founded in Sicily in 2002, CATANA - the Adrotherapy and Advanced Nuclear Applications Centre operates using the superconducting cyclotron, the particle accelerator of the National Nuclear Physics Institute's National Laboratories for Southern Italy and the cooperation of the Azienda Ospedaliera Policlinico dell'Università degli Studi di Catania, which makes available its radiodiagnostics, oncological radiotherapy and eye clinic facilities. It was the first centre in Italy to treat patients with adrotherapy: since its foundation over 360 patients have been treated, with a success rate of approximately 95%.

CATANA is one of those important examples of how the technologies and techniques developed in the particle physics field can be used successfully in medicine for both diagnostic and therapeutic purposes and for research on new drugs. More specifically, accelerator physics is of crucial importance for the development of **cancer therapies** (adrotherapy) for the treatment of localised tumours, characterised by a very high precision and low impact on healthy tissues. This is demonstrated in Italy by the development of the Eye Adrotherapy Centre in Catania (**CATANA**), the Oncological Adrotherapy Centre in Pavia (**CNAO**) and, most recently, the Protontherapy Centre in Trento.

Imaging diagnostics also owes a great deal to nuclear physics, which has led to the development of computed tomography (CT), Positron Emission Tomography (PET), the first practical application of antimatter and nuclear magnetic resonance (NMR). More specifically, the INFN **National Laboratories in Legnaro** are involved in the construction of the new **SPES** infrastructure for the production of radioisotopes for medical diagnostics. In addition, the experience accrued in the development of image analysis **algorithms and software** has been used in the automatic analysis programmes being studied for use in future screening programmes. ■