



«ETTORE MAJORANA» FOUNDATION AND CENTRE FOR SCIENTIFIC CULTURE  
TO PAY A PERMANENT TRIBUTE TO GALILEO GALILEI, FOUNDER OF MODERN SCIENCE  
AND TO ENRICO FERMI, THE «ITALIAN NAVIGATOR», FATHER OF THE WEAK FORCES



# INTERNATIONAL SCHOOL ON HADRON THERAPY «EDWIN McMILLAN»

## 1st Workshop: HADRON BEAM THERAPY OF CANCER

ERICE-SICILY: 24 APRIL – 1 MAY 2009

Sponsored by the: • Italian Ministry of Education, University and Scientific Research • Sicilian Regional Government  
Istituto Nazionale di Fisica Nucleare • Ion Beam Accelerators • VARIAN Medical Systems • e2V

### PROGRAMME AND LECTURERS

*A 300 MeV Superconducting cyclotron for hadrontherapy*  
*Biological treatment planning and challenges resulting from spot scanning*  
*Carbon and proton radiation therapy plans at CNAO*  
*Comparison of photon therapy, brachytherapy and hadrontherapy*  
*Comparison of various treatment plannings*  
*Commercial construction of cyclotrons at Accel-Varian*  
*Cost effectiveness of hadrontherapy*  
*Dosimetric aspects of protontherapy*  
*FFAG accelerators*  
*Future design for optimum effectiveness*  
*Gantry design at PSI, Heidelberg and novelties*  
*Hadrontherapy at CAL: present status and future perspectives*  
*High gradient linacs*  
*Ion beam facilities from a medical perspective*  
*Laser-driven protontherapy*  
*Linacs and new approaches*  
*Medical requirements for FFAG as particle beam sources for radiotherapy*  
*Operational experience at Mass. General Hospital, PSI and LNS of INFN*  
*Overview of NIRS accelerator activity*  
*PROBEAT: Hitachi protontherapy system*  
*Proposed therapy facilities in China, Austria and Pennsylvania*  
*Rapid cycling medical synchrotrons*  
*Recent progress in cyclotrons for proton and carbon radiation therapy at IBA*  
*Scattering and scanning systems with and without gantries*  
*The design of CNAO*  
*The Heidelberg ion therapy centre*  
*The RACCAM project*  
*The UK non-scaling FFAG medical facility Pamela*  
*25 years of proton radiation therapy at PSI: an overview*

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• A. BRAHME, Karolinska Institutet, Stockholm, SE  
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#### PURPOSE OF THE WORKSHOP

Hadrontherapy is a fast growing activity. Nowadays, there are dozens of centres and half a dozen commercial suppliers. At the Workshop, physicians will present the experience in treating various tumours and discuss the characteristics needed for effective therapy both with X-rays and with hadrons. Various approaches to hadrontherapy will be discussed. These consist of cyclotrons, cyclotrons followed by linacs, synchrotrons, and various novel methods. In each case, we will have the basics presented, pro and cons delineated, commercial presentations of presently available ("off the shelf") machines, and talks given on future possible developments. The same approach will be used for presenting gantries, as well as for features of complete facilities. A few of the participants will be radiation oncologists, while the rest of the participants will be accelerator builders (academic and industrial suppliers) and treatment planners.

#### APPLICATIONS

Persons wishing to attend the Workshop should apply only on the WEB page:

#### Contacts:

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**Closing date for Application: December 31, 2008**

#### PLEASE NOTE

Participants must arrive in Erice on April 24, 2009, not later than 7 pm.

#### POETIC TOUCH

According to legend, Erice, son of Venus and Neptune, founded a small town on top of a mountain (750 metres above sea level) more than three thousand years ago. The founder of modern history — i.e. the recording of events in a methodic and chronological sequence as they really happened without reference to mythical causes — the great Thucydides (~500 B.C.), writing about events connected with the conquest of Troy (1183 B.C.) said: «After the fall of Troy some Trojans on their escape from the Achaei arrived in Sicily by boat and as they settled near the border with the Sicilians all together they were named Elymi: their towns were Segesta and Erice.» This inspired Virgil to describe the arrival of the Trojan royal family in Erice and the burial of Anchise, by his son Enea, on the coast below Erice. Homer (~1000 B.C.), Theocritus (~300 B.C.), Polybius (~200 B.C.), Virgil (~50 B.C.), Horace (~20 B.C.), and others have celebrated this magnificent spot in Sicily in their poems. During seven centuries (XIII-XIX) the town of Erice was under the leadership of a local oligarchy, whose wisdom assured a long period of cultural development and economic prosperity which in turn gave rise to the many churches, monasteries and private palaces which you see today.

In Erice you can admire the Castle of Venus, the Cyclopean Walls (~800 B.C.) and the Gothic Cathedral (~1300 A.D.). Erice is at present a mixture of ancient and medieval architecture. Other masterpieces of ancient civilization are to be found in the neighbourhood: at Motya (Phoenician), Segesta (Elymian), and Selinunte (Greek). On the Aegadian Islands — theatre of the decisive naval battle of the first Punic War (264-241 B.C.) — suggestive neolithic and paleolithic vestiges are still visible: the grottoes of Favignana, the carvings and murals of Levanzo.

Splendid beaches are to be found at San Vito Lo Capo, Scopello, and Cornino, and a wild and rocky coast around Monte Cofano: all at less than one hour's drive from Erice.

**More information about the «Ettore Majorana» Foundation and Centre for Scientific Culture can be found on the WWW at the following address:**  
<http://www.ccsem.infn.it>

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<http://erice2009.na.infn.it>