FINAL BOOK of ABSTRACTS

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Log 477. **PARTICLE THERAPY INTERNATIONAL MASTERCLASS: THE FIRST ITALIAN EXPERIENCE**
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For the first time, Italy participated in the International Particle Therapy Masterclass, a training event promoted by the International Particle Physics Outreach Group, with the purpose to bring students of the last year of High School closer to physics applied to medicine, showing them the importance of basic research and its impact on society, in particular, on human health. The event was organized as follow. The morning was dedicated to seminaries devoted to explanation of artificial radionuclides production for theranostics application in Nuclear Medicine; to the radiotherapy carried out with different external beams, with an in-depth discussion and debate about the strengths and weaknesses that each technique presents; to a virtual visit to the Italian National Center for Oncological Adrotherapy in Pavia (CNAO). In the afternoon, the students participated to a hand-on session with the use of MatRad s/w, developed and used by German Cancer Research Center DKFZ in Heidelberg. The students realized a real treatment plan to treat tumors of specific organs with different particle beams (photons, protons, carbon ions). Finally, they presented their results in an international virtual meeting organized at CERN with the students of the other participant institutes around the world and in the presence of experts. In this contribution, this rich and stimulating experience which made “researchers” for one day twenty-two students selected from different schools in Lombardy and Calabria Italian regions, will be presented.

Log 478. **DEVELOPMENT OF GALLIUM OXIDE BASED ULTRAWIDE BANDGAP SEMICONDUCTOR DETECTOR FOR ALPHA SPECTROSCOPY**
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A set of semiconductor radiation detectors intended for real-time alpha spectroscopy of molten actinide salt has been fabricated at The Ohio State University’s Nanotech cleanroom facility using epitaxial gallium oxide grown at a doping concentration on the order 1015 cm-3 by Novel Crystal Technologies. The detectors are designed to include a 22 nm thick BaTiO3 electron blocking layer sputter coated onto an 11-micron thick epitaxial layer of gallium oxide grown on bulk gallium oxide wafers. This is capped with a 100 nm gold contact forming a Schottky barrier between the gold and gallium oxide while the BaTiO3 prevents electrons tunneling past the Schottky barrier. This contact is protected by a 30 nm Pt outer layer with metal contacts annealed to form an Ohmic contact on the reverse face. Alpha spectra are collected under exposure to an Am-241 source in vacuum through a charge sensitive preamplifier and digitizer setup then passed to a PC. The detectors are evaluated using C-V and I-V electrical characterization to establish the formation of Schottky diodes and the maximum applied reverse bias prior to breakdown. Previously fabricated gallium oxide Schottky detectors displayed an effective resolution of 11%, potentially degraded by imperfections present in the epitaxial layer and surface leakage current.