DOTTORATO IN

MATHEMATICAL MODELS FOR ENGINEERING,

ELECTROMAGNETICS and NANOSCIENCES

Curriculum: Mathematics for Engineering   November 8th 2017

Vincenzo Patera (Sapienza,SBAI): The particle therapy of cancer: an interdisciplinary approach, , room 1B1 RM002 11:00 (SBAI)

In the last decade the irradiation of cancer with carbon and proton beams has became a bleeding edge approach to the tumor therapy. The seminar will highlight the R&D feature of this innovative technique, with particular attention to the several aspects where the cooperation (if not contamination) of physics, mathematics and engineering lead to improved results in clinical practice.

Vincenzo Patera is associate professor of Physics at SBAI Department of University of Rome "Sapienza". His research activity has been shared between elementary particle physics and application of nuclear physics to medicine.He coordinates research group focused on cancer treatment using proton and carbon beam, including design of new monitoring devices and development of innovative mathematical and software tool for the dose delivery control. He collaborates with cancer treatment center like CNAO in Pavia, TIFPA in Trento and HIT at Heidelberg.

Giuseppe Pontrelli (IAC,CNR), room 1B1 Pal. RM002 12:00 (SBAI)
Mathematical models and methods in biomedicine: new challenges and applications
This talk provides a comprehensive overview of mathematical research applied to biology, with particular emphasis on reaction- diffusion problems for drug-eluting stents, transdermal patches and transport of molecules such as ATP and ADP from endothelium.
The results allow to better understand the evolution of some physiological processes and,in perspective, used to optimize the design of biomedical devices.

Giuseeppe Pontrelli is senior researcher at Istituto per le Applicazioni del Calcolo, CNR in Roma. He has a background experience in continuum physics and computational fluid dynamics. His present research work concerns mathematical models for biomedical flows, multi phenomena, and drug delivery systems. The main mathematical problems are reaction-diffusion equations at the macroscopic scale or discrete methods at mesoscopic level, tuned or combined according to the nature and the physical scale of the phenomenon. He presently collaborates with theoretical and experimental groups involved in biomedical problems such as the University of Glasgow (drug-eluting stents) and the Ecole Polytechnique, Paris (ATP-ADP release from endothelial cells).