Università Politecnica delle Marche

Inter-departmental Crystal Research & Analysis Center

ICRYS

DIISM **SIMAU** **DICEA**

SCINTILLATOR DETECTORS: from Theory to Applications

(Medicine, Security, High Energy Physics and Engineering)

Serie of seminars and meetings

Lecture:

Basics principles and systems in Radiation Diagnostic Imaging

May 9th, 2023 at 10.00

Room 160/3 - Faculty of Engineering

Università Politecnica delle Marche, Ancona

(Link to follow the seminar on-line)

Medical imaging is indicated for human pathological (anatomical and physiological) investigations and its effectiveness is attributed to the differences in tissue of radiation attenuation and to the capability of the detective system to transform radiation to visible signals, to create an image and finally to proceed to a specific diagnostic task. Every single system involved in the aforementioned procedure affects the signal transferred out of the detector and plays a critical role in the quality of the image and thus in diagnosis validity. Imaging science and technology are able to show and combine morphological, functional, and metabolic information. During the staging of cancer (i.e., from screening and biopsy guidance for detection up to therapy response and palliation), multiple biomedical imaging techniques are used. A large portion of methods and systems for medical imaging were developed on the basis of accurate detection of ionizing radiation transmitted through or emitted by the human body (e.g., X-ray projection Imaging, Mammography, Computed Tomography (CT) etc.).

Panagiotis Liaparinos

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Panagiotis Liaparinos received his B.Sc. degree from the Department of Medical Instruments Technology of the Technological Educational Institute of Athens, Greece, in 2002, and the M.Sc. and Ph.D. degrees in medical physics from the University of Patras, Greece, in 2004 and 2007, respectively.

Research areas: His research interests include: phosphor-based X-ray detectors, optical diffusion modelling and Monte Carlo techniques. During his Ph.D. studies, he joined the Technical University of Madrid, through a European Marie Curie Fellowship. From 2007 up to 2009 his postdoctoral research was mainly focused on extending the Monte Carlo software in different imaging conditions (e.g. for a wider range of X-ray energies) and evaluating X-ray detectors composed of nano-particles. He analyzed the limitations of Mie scattering theory and discussed the advantages of nano-particles in early diagnosis of breast cancer. He has developed the LIGHTAWE Monte Carlo simulation tool on optical diffusion studies purposes His published work includes 46 publications in peer reviewed journals, 80 publications in international scientific conferences. He has participated in several national, international and European research projects. Currently, he holds the position of Associate Professor at the Biomedical Engineering Department of the University of West Attica in Greece.

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