

# Ioannis S. KANDARAKIS

(Curriculum Vitae)

## Personal details

**Family name:** KANDARAKIS  
**Given name:** Ioannis  
**Date of Birth:** 05.01.1953 /Athens, Greece  
**E-mail addresses:** [kandarakis@teiath.gr](mailto:kandarakis@teiath.gr)  
kandarakis@upatras.gr

**Current position:** Professor, Head of Department (Medical Instruments Technology)  
  
Director of Laboratory of Ionizing and Non-Ionizing Radiations and Imaging Systems  
Department of Medical Instruments Technology  
Technological Educational Institution (TEI) of Athens  
  
Agiou Spyridonos, Aigaleo, 122 10, Athens, Greece.  
Telephone number: +30210- 5385387, +30210-5385303

**International Societies:** American Association of Physicists in Medicine (AAPM)  
International Society for Radiation Physics (ISRP)  
European Association of Radiology (EAR-ECR)  
European Society for Engineering and Medicine (ESEM)  
IEEE

**Home address:** Farantaton 54, 115 27, Athens, Greece  
Telephone number: +30210-7773541, +30 6972845898, +30 6982015017

## Education-Qualifications

- First degree: *Physics* ("Ptyheion"). Department of Physics, University of Patras, 1977.
- Postgraduate degree : *Diplome d' Etudes Approfondies (DEA): Physique Radiologique / Medicale.* Faculte des Sciences, Unite Physique-Chimie-Automatique, Centre de Physique Atomique de Toulouse (CPAT), Universite "Paul Sabatier"- Toulouse III, 1978,
- Doctorate degree: *Doctorat de Physique Radiologique / Medicale.* Faculte des Sciences, Unite Physique-Chimie-Automatique, Centre de Physique Atomique de Toulouse (CPAT), Universite "Paul Sabatier"-Toulouse III, 1981

## Research and Scientific Activities

### Areas of research

- Scintillator and phosphor materials evaluation for application in detectors of x-ray and gamma-ray medical imaging systems (*Experimental and theoretical methods*)
- Monte Carlo and analytical simulation methods in Physics of Diagnostic Radiology and Nuclear Medicine (*Physics and Instrumentation*)

- Evaluation of medical imaging systems using objective image quality metrics (*Experimental and theoretical methods applied in Digital Radiology, Nuclear Medicine and in Portal Imaging – Radiation Therapy*)
- Non-ionizing radiations applications (*Magnetic Resonance Imaging /UltrasonicImaging*)

### Scientific Publications:

- 88 publications in peer-reviewed scientific journals (see attached list)
- 120 publications in conference proceedings and conference abstracts
- 250 (approximately) citations to published work (excluding self-citations)

### Text Books (in Greek language):

- Medical Physics-Biomedical Engineering: Diagnostic Radiology (ISBN: 978-960-89768-1-8)
- Medical Physics-Biomedical Engineering: Nuclear Medicine (ISBN: 978-960-91034-8-0)
- Medical Physics-Biomedical Engineering: Magnetic Resonance Imaging (978-960-91034-9-7) (co-author with A. Karatopis)

### Reviewer in scientific journals:

- European Radiology
- Journal of Materials Science
- Optical Materials
- European Materials Research Symposium-2006
- Medical and Biological Engineering and Computing
- Nuclear Instruments and Methods in Physics Research A
- Medical Physics
- Physica Medica
- Journal of Raman Spectroscopy
- Journal of Alloys and Compounds

### Member of conference committees / session chairman / invited speaker

1. V. International symposium on Biomedical Engineering. Santiago. Spain, September 1994. (Session on Biophysical and Biochemical measurements)
2. Mediterranean Conference on Medical and Biological Engineering-Medicon, Jerusal. Israel 1995
3. VI. International conference on Medical Physics. Patras, Greece. September 1999 (Session on New Developments in Medical Image Detectors)
4. II. Mediterranean Conference on Medical Physics Cyprus, May 2004
5. I. International conference from computer science to computational engineering. Athens. August, 2004
6. I. International conference on experiments, processes, system modeling, simulation, optimization (IC-EpsMso), Athens, Greece, July, 2005 (sessions chairman, member of scientific committee)
7. International World Scientific and Engineering Society (WSEAS) Conference on “Enginnering Education”, Vouliagmeni, Athens, July, 2005 (sessions chairman, member of scientific committee)
8. II. International conference from computer science to computational engineering.(Scientific committee, mini-symposium organizer (medical imaging), session chairman). Athens.July, 2006
9. II. International conference on experiments, processes, system modeling, simulation, optimization (IC-EpsMso), Athens, Greece, July, 2007 (sessions chairman, member of scientific committee) // mini-symposium organizer (medical imaging),

10. III. International conference from computer science to computational engineering. (Scientific committee, mini-symposium organizer (medical imaging), session chairman). Athens. July, 2008
11. III. International conference on experiments, processes, system modeling, simulation, optimization (IC-EpsMso), Athens, Greece, July, 2009 (sessions chairman, member of scientific committee) // mini-symposium organizer (medical imaging),
12. IV. International conference from computer science to computational engineering. (Scientific committee, mini-symposium organizer (medical imaging), session chairman). Athens. July, 2010
13. IV. International conference on experiments, processes, system modeling, simulation, optimization (IC-EpsMso), Athens, Greece, July, 2011 (sessions chairman, member of scientific committee)
14. 2nd Panhellenic Conference of Biomedicine and Medical Technological Equipment (Vice President of the Scientific Committee, invited speaker and Session Chairman), Kavala, May 27-29, 2011

### Scientific projects

- Participation in ten (10) research projects (coordinator in 3)

### Evaluator in scientific proposals

- In research and educational proposals within the Greek Ministry of Education EPEAEK framework (14)

### Member of supervising committees for doctorate dissertations and coordinator in post-doctoral research

- In ten (10) doctorates
- In one (1) post-doctoral research project

### Teaching experience

- **Technological Educational Institution (TEI) of Athens**, Athens, Greece
  - (i) Dept. of Radiology Technology  
Courses: Radiation Physics I and II, Radioactive isotopes I and II
  - (ii) Dept of Medical Instruments Technology  
Courses: Ionizing Radiation Technology I, II, III  
(*Medical Imaging/Radiology-Nucl. Med-MRI-US and Radiation Therapy instrumentation*).  
From September 1985 until today
- **Military School "Euelpidon"** -Vari, Athens, Greece  
Laboratory of Physics  
Course: General Physics  
From September 1985 until June 1989
- **University of Crete**-Herakleion, Greece  
Department of Medicine, Faculty of Health Sciences  
Laboratory of Medical Physics  
Course: Medical Physics I and II  
Instrumentation of Medical Imaging Systems  
Spectroscopy methods in Biology and Medicine  
From March 1987 until December 1989
- **University of Thessaly**-Larissa, Greece  
Department of Medicine, Faculty of Health Sciences

Laboratory of Medical Physics.  
Courses: Medical Physics  
Ionizing and non-ionizing radiations in Medicine  
From September 1997 until 2000

Postgraduate courses

- **University of Patras**- Patras, Greece  
Department of Medicine and Department of Physics  
*Postgraduate course on "Medical Physics"*  
Courses: Physics of Diagnostic Radiology  
Physics of Nuclear Medicine (*Module co-ordinator*)  
From September 1994 until today
- **University of Athens, TEI of Athens, Biomedical Research Foundation Academy of Athens, Institute of Informatics "Democritus" Research Centre of Physical Sciences** Athens, Greece  
Dept. of Informatics and Telecommunications (UoA), Dept of Med. Instrum. (TEI)  
*Postgraduate programme "Information Technologies in Medicine and in Biology"*  
Course: Medical Imaging Systems  
From September 2007

**Professional and training experience**

- 251 General Airforce Hospital-Athens, Greece.  
Depts. of Diagnostic Radiology, Ultrasound, Computed Tomography.  
From July 1982 until September 1983.  
And from January 1985 until April 1989.
- "Aretaieion" University General Hospital-Athens, Greece  
Depts. of Nuclear Medicine and Radiation Therapy  
From November 1983 until June 1984.
- Regional University General Hospital of Crete -Herakleion, Greece.  
Dept. of Diagnostic Radiology  
From May 1989 until January 1990.

**LISTS OF SCIENTIFIC PUBLICATIONS, RESEARCH PROJECTS, DOCTORAL SUPERVISING  
COMITEES, CITATIONS**

**A. SCIENTIFIC PUBLICATIONS**

**Scientific publications in international journals**

1. Kandarakis I., Cavouras D., Panayiotakis G.S., Agelis T., Nomicos C.D., and Giakoumakis G. "X-ray induced luminescence and spatial resolution of La<sub>2</sub>O<sub>2</sub>S:Tb phosphor screens". *Physics in Medicine and Biology*.41: 297-307, 1996.

2. Panayiotakis G.S., Cavouras D., Kandarakis I., Nomicos C.D. "A study of X-ray luminescence and spectral compatibility of europium-activated yttrium-vanadate (YVO<sub>4</sub>:Eu) screens for medical imaging applications." *Applied Physics. A (Materials Science and Processing)* 62, 483-486, 1996.
3. Cavouras D., Kandarakis I., Panayiotakis G.S., Evangelou E., and Nomicos C.D. "An evaluation of the Y<sub>2</sub>O<sub>3</sub>: Eu<sup>3+</sup> scintillator for application in medical X-ray detectors and image receptors". *Medical Physics* 23 (12), 1965-1975, 1996.
4. Kandarakis I., Cavouras D., Panayiotakis G.S., and Nomicos C.D. "Evaluating x-ray detectors for radiographic applications: Comparison of ZnSCdS:Ag with Gd<sub>2</sub>O<sub>2</sub>S:Tb and Y<sub>2</sub>O<sub>2</sub>S:Tb screens". *Physics in Medicine and Biology*, 42, 1351-1373, 1997.
5. Kandarakis I., Cavouras D., Panayiotakis G.S., Triantis D., and Nomicos C.D. "An experimental method for the determination of spatial frequency dependent detective quantum efficiency (DQE) of scintillators used in x-ray imaging detectors". *Nuclear Instruments and Methods in Physics Research A., (Accelerators, Spectrometers, Detectors and Associated Equipment)* 399, 335-342, 1997.
6. Kandarakis I., Cavouras D., Panayiotakis G.S., Triantis D., and Nomicos C.D. "Europium activated phosphors for use in x-ray detectors of medical imaging systems". *European Radiology*, 8, 313-318, 1997.
7. Cavouras D., Kandarakis I., Panayiotakis G.S., Kanellopoulos E., Triantis D., and Nomicos C.D. "An investigation of the imaging characteristics of the Y<sub>2</sub>O<sub>2</sub>S:Eu phosphor for application in x-ray detectors of digital mammography". *Applied Radiation and Isotopes*, 49, 931-937, 1998.
8. Cavouras D., Kandarakis I., Panayiotakis G.S., Bakas A., Triantis D., and Nomicos C.D. "An experimental method to determine the effective efficiency of scintillator-photodetector combinations used in x-ray medical imaging systems". *British Journal of Radiology*, 71, 766-772, 1998.
9. Kandarakis I., Cavouras D., Kanellopoulos E., Nomicos C.D., and Panayiotakis G.S.. "Image quality evaluation of YVO<sub>4</sub>: Eu phosphor screens for use in x-ray medical imaging detectors". *Radiation Measurements*, 29:481-486, 1998.
10. Kandarakis I., Cavouras D., Kanellopoulos E., Panayiotakis G.S., and Nomicos C.D. "Experimental determination of detector gain, zero frequency detective quantum efficiency, and spectral compatibility of phosphor screens: comparison of CsI: Na and Gd<sub>2</sub>O<sub>2</sub>S:Tb for medical imaging applications". *Nuclear Instruments and Methods in Physics Research, A, (Accelerators, Spectrometers, Detectors and Associated Equipment)* 417: 86-94, 1998.
11. Cavouras D., Kandarakis I., Prassopoulos P., Kanellopoulos E., Nomicos C.D., and Panayiotakis G.S. "Experimental evaluation of noise equivalent passband, information capacity, and informational efficiency of yttrium based europium activated phosphors for use in x-ray imaging detectors". *Physica Medica* 14:119-126, 1998.
12. Kandarakis I., Cavouras D., Prassopoulos P., Kanellopoulos E., Nomicos C.D., and Panayiotakis G.S. "Evaluating Zn<sub>2</sub>SiO<sub>4</sub>:Mn phosphor for use in medical imaging radiation detectors". *Applied Physics, A (Materials Science and Processing)*, 67:521-525, 1998.

13. Kandarakis I., Cavouras D., Kanellopoulos E., Nomicos C.D., and Panayiotakis G.S. "A method for information capacity determination of x-ray scintillators used in medical imaging detectors". *Medical and Biological Engineering and Computing*, 37:25-30, 1999.
14. Cavouras D., Kandarakis I., Prassopoulos P., Kanellopoulos E., Nomicos C.D., and Panayiotakis G.S. "A method to evaluate the performance of x-ray imaging scintillators by means of the brightness-sharpness index (BSI)." *Acta Radiologica*, 40: 211-216, 1999.
15. Cavouras D., Kandarakis I., Prassopoulos P., Kanellopoulos E., Nomicos C.D., and Panayiotakis G.S. "Evaluating phosphors for use in x-ray image detectors by the effective performance index (EPI) method: application to  $\text{Eu}^{3+}$  activated yttrium based materials." *Technology and Health Care*, 7: 53-61, 1999.
16. Kandarakis I., Cavouras D., Prassopoulos P., Kanellopoulos E., Nomicos C.D., and Panayiotakis G.S. "Evaluating scintillators used in radiation detectors of medical imaging systems by the effective fidelity index (EFI) method." *European Journal of Radiology*. 30: 61-66, 1999.
17. Cavouras D., Kandarakis I., Kanellopoulos E., Nomicos C.D., and Panayiotakis G.S. "Signal to Noise Ratio (SNR) of x-ray imaging scintillators determined by luminescence measurements." *Applied Radiation and Isotopes*, 51: 59-68, 1999.
18. Kandarakis I., Cavouras D., Nomicos C.D., and Panayiotakis G.S. "Phosphor material evaluation for use in medical imaging radiation detectors by the Noise Equivalent Quanta (NEQ) method". *Applied Physics B (Lasers and Optics)*, 68: 1121-1124, 1999.
19. Kalivas N., Kandarakis I., Cavouras D., Costaridou L., Nomicos C.D., and Panayiotakis G.S., "Modeling quantum noise transfer function (QNTF) of phosphors used in medical x-ray imaging detectors" *Nuclear Instruments and Methods in Physics Research, A (Accelerators, Spectrometers, Detectors and Associated Equipment)*, 430: 559-569, 1999.
20. Kandarakis I., Cavouras D., Kalivas N., Nomicos C.D., and Panayiotakis G.S. "Estimation of the information content of medical images produced by scintillators interacting with diagnostic x-ray beams". *Nuclear Instruments and Methods in Physics Research, B. (Beam Interactions with Materials and Atoms)*, 155:199-205, 1999.
21. Kalivas N., Costaridou L., Kandarakis I., Cavouras D., Nomicos C.D., Panayiotakis G.S. " Effect of intrinsic-gain fluctuations on quantum noise of phosphor materials used in medical X-ray imaging" *Applied Physics A (Materials Science and Processing)*, 69: 337-341, 1999.
22. Cavouras D., Kandarakis I., Nomicos C.D., Panayiotakis G.S., and Fezoulidis I. " Assessing the information content of phosphor produced medical images: application to  $\text{Zn}_2\text{SiO}_4\text{:Mn}$  phosphor". *Applied Radiation and Isotopes*, 52: 119-126, 2000.
23. Cavouras D., Kandarakis I., Nomicos C.D., Bakas A., and Panayiotakis G.S. "Performance evaluation of  $(\text{Gd,La})_2\text{O}_3\text{:Tb}$  phosphor for medical imaging applications under x-ray excitation". *Radiation Measurements*, 32: 5-13, 2000.
24. Cavouras D., Kandarakis I., Maris T., Panayiotakis G.S., and Nomicos C.D. "Assessment of the gain transfer function (GTF) of phosphors for application in medical imaging radiation detectors." *European Journal of Radiology* 35:70-77, 2000.

25. Cavouras D., Kandarakis I., Maris T., Panayiotakis G.S., and Nomicos C.D. "Entropy as a measure of the performance of phosphors used in medical imaging radiation detectors" *Applied Physics A.(Materials Science and Processing)*, 72: 67-72, 2000
26. Kandarakis I. and Cavouras D.: "Experimental and theoretical assessment of the performance of  $Gd_2O_3S:Tb$  and  $La_2O_3S:Tb$  phosphors and  $Gd_2O_3S:Tb-La_2O_3S:Tb$  mixtures for X-ray imaging. *European Radiology*. 11: 1083-1091, 2001.
27. Kandarakis I. and Cavouras D.: " Modeling the effect of light generation and light attenuation on the performance of phosphors used in medical imaging radiation detectors". *Nuclear Instruments and Methods in Physics Research, A. (Accelerators, Spectrometers, Detectors and Associated Equipment)*, 460: 412-423, 2001.
28. Kandarakis I. and Cavouras D.: "Role of the activator on the performance of scintillators used in x-ray imaging. *Applied Radiation and Isotopes*, 54: 821-831, 2001.
29. Kandarakis I., Cavouras D., Nomicos C.D., and Panayiotakis G.S. Measurement of the X-ray luminescence and spectral compatibility of the  $CdPO_3Cl:Mn$  phosphor. *Radiation Measurements*, 33: 217-225, 2001
30. Kandarakis I., Cavouras D., Panayiotakis G.S, Nomicos C.D.Experimental investigation of the optical signal, gain, signal to noise ratio and information content of x-ray phosphor screens. *Applied Physics B (Lasers and Optics)*, 72: 887-883, 2001
31. Kandarakis I., Cavouras D., Nomicos CD.,and Panayiotakis G.S. X-ray luminescence of  $ZnSCdS: Au,Cu$  scintillator. *Nuclear Instruments and Methods in Physics Research,B (Beam Interactions with Materials and Atoms)*, 179, 215-224. 2001.
32. Cavouras D., Kandarakis I., Tsoukos S., Kateris A., Nomicos C.D., Panayiotakis G.S. Theoretical model for calculation of the detective quantum efficiency of granular scintillators. *Applied Radiation and Isotopes*. 55, 831-842, 2001
33. Cavouras D., Kandarakis I., Panayiotakis G., Nomicos C.D. Integrated model for estimating phosphor signal and noise transfer characteristics on medical images: application to  $CdPO_3Cl:Mn$  phosphor screens. *Medical and Biological Engineering and Computing*. 40, 2002.
34. Kalivas N., Costaridou L., Kandarakis I., Cavouras D., Nomicos C.D., and Panayiotakis G.S., "Modelling quantum and structure noise of phosphors used in medical x-ray imaging detectors" *Nuclear Instruments and Methods in Physics Research, A (Accelerators, Spectrometers, Detectors and Associated Equipment)*, 490: 614-629, 2002
35. Kandarakis I., Cavouras D., Ventouras E., Nomicos CD. Theoretical evaluation of granular scintillators quantum gain incorporating the effect of K-fluorescence emission into the energy range from 25 to 100 keV. *Radiation Physics and Chemistry* , 66: 257-267, 2003
36. Kalivas N., Costaridou L., Kandarakis I., Cavouras D., Nomicos CD., Panayiotakis GS. "Optical gain signal-to-noise ratio transfer efficiency as an index for various phosphor-detector combinations used in x-ray medical imaging". *Applied Physics A (Materials Science and Processing)*, 2003

37. Kandarakis I., Cavouras D., Nikolopoulos D., Anastasiou A., Ventouras E., Kalatzis I., Dimitropoulos N., Kalivas N., Panayiotakis G.: "Evaluation of ZnS: Cu phosphor as x-ray to light converter under mammographic conditions". *Radiation Measurements*, 39: 263-267, 2005
38. Kandarakis I., Cavouras D., Sianoudis I., D. Nikolopoulos, Dimitropoulos N., Kourkoutas N. Kalivas, Panayiotakis G. et al.: On the response of YAG:Ce powder scintillator to medical imaging x-rays. *Nuclear Instruments and Methods in Physics Research, A (Accelerators, Spectrometers, Detectors and Associated Equipment)*, A 538: 615-630, 2005.
39. D. Cavouras, I. Kandarakis, D. Nikolopoulos, I. Kalatzis, A. Episkopakis, G. Kagadis, N. Kalivas, D. Linardatos, M. Roussou, E. Nirgianaki, D. Margetis, I. Valais, I. Sianoudis, K. Kourkoutas, N. Dimitropoulos, A. Louizi, C. Nomicos, G. Panayiotakis.: Light emission efficiency and imaging performance of  $Y_2Al_5O_{12}$ : Ce (YAG: Ce) powder screens under diagnostic radiology conditions. *Applied Physics B (Lasers and Optics)*, 80: 923-933, 2005.
40. I. Valais, I. Kandarakis, D. Nikolopoulos, I. Sianoudis, N. Dimitropoulos, D. Cavouras, C. Nomicos, G. Panayiotakis.: Luminescence efficiency of  $Gd_2SiO_5$ : Ce scintillator under x-ray excitation. *IEEE Transactions on Nuclear Science TNS-52 (5)*: 1830-1835, 2005
41. I. Kandarakis, Cavouras, D., Nikolopoulos D., Kalivas N., Episkopakis A., Liaparinos P., Kagadis G., Sianoudis I., Kourkoutas K., Nomicos C., Panayiotakis G. Theoretical model for evaluation of the angular distribution of the luminescence emission in granular scintillating screens. *Applied Radiation and Isotopes* 64: 508-519, 2006
42. Nikolopoulos D., Valais, I. Kandarakis I., Cavouras D., Linardatos D., Sianoudis I. Louizi A., Nomicos C. D. Vattis, Panayiotakis G. Evaluation of the GSO: Ce scintillator in the energy range from 40 to 140 kV for possible applications in medical imaging. *Nuclear Instruments and Methods in Physics Research A (Accelerators, Spectrometers, Detectors and associated Equipment)*, A 560, 577-583. 2006
43. G. Patatoukas, A. Gaitanis, N. Kalivas, A. Konstandinidis, D. Nikolopoulos, I. Kandarakis, D. Cavouras, J. Sianoudis, N. Dimitropoulos, G. Panayiotakis. The effect of energy weighting on SNR under the influence of non-ideal detectors in mammographic applications. *Nuclear Instruments and Methods in Physics Research A (Accelerators, Spectrometers, Detectors and associated Equipment)* 569: 260-263, 2006, 2006
44. N. Karakatsanis, N. Sakellios, X. Tsantilas, N. Dikaios, C. Tsoumpas, D. Lazaro, G. Loudos, A. Louizi, I. Valais, D. Nikolopoulos, J. Malamitsi, I. Kandarakis, K. Nikita. A Comparative Evaluation of two commercial Positron Emission Tomography (PET) Scanners ECAT EXACT HR+ and Biograph 2, using GATE. *Nuclear Instruments and Methods in Physics Research A (Accelerators, Spectrometers, Detectors and associated Equipment)* 569: 368-372, 2006
45. Kalivas N., Valais I., Salemis G., Nikolopoulos D., Loudos G., Nikita K., Giokaris N., Cavouras D.,... Panayiotakis G., I. Kandarakis. Imaging performance of cerium-doped yttrium aluminum perovskite (YAP: Ce) powder scintillating screens under x-ray excitation. *Nuclear Instruments and Methods in Physics Research A (Accelerators, Spectrometers, Detectors and associated Equipment)* 569: 210-214, 2006
46. Liaparinos P., Kandarakis I., Cavouras D., Dellis H., Panayiotakis G. Investigating the effect of K-fluorescence characteristic radiation on the performance of nuclear medicine scintillators by Monte Carlo methods. *Nuclear Instruments and Methods in Physics Research A (Accelerators, Spectrometers, Detectors and associated Equipment)* 569: 364-367, 2006



47. Nikolopoulos D., Kandarakis I., Tsantilas X., Valais I., Cavouras D., Louisi A. Comparative evaluation of the radiation detection efficiency of LSO, LuAP, GSO and GSO scintillators for application in positron emission (PET) imaging via Monte Carlo methods. *Nuclear Instruments and Methods in Physics Research A (Accelerators, Spectrometers, Detectors and associated Equipment)* 569: 350-354, 2006
48. Liaparinos P., Kandarakis I., Cavouras D., Dellis H., Panayiotakis G. Evaluating the radiation detection of  $\text{RbGd}_2\text{Br}_7\text{:Ce}$  scintillator by Monte Carlo methods. *Nuclear Instruments and Methods in Physics Research A (Accelerators, Spectrometers, Detectors and associated Equipment)* 569: 355-358, 2006
49. Valais I., Kandarakis I., Nikolopoulos D.,....., N. Dimitropoulos, Cavouras D., Panayiotakis G. Evaluating the light emission efficiency of the  $\text{LYSO: Ce}$  scintillator under x-ray excitation for possible applications in medical imaging. *Nuclear Instruments and Methods in Physics Research A (Accelerators, Spectrometers, Detectors and associated Equipment)* 569: 201-204, 2006
50. Nikolopoulos D., Kandarakis I., Cavouras D., et al. Investigation of the radiation absorption and x-ray fluorescence properties of medical imaging scintillators by Monte Carlo methods. *Nuclear Instruments and Methods in Physics Research A (Accelerators, Spectrometers, Detectors and associated Equipment)* (accepted corrected proof), 2006
51. Gonias P., Bertsekas N., Saatsakis G., Nikolopoulos D.,.....Kandarakis I., Panayiotakis G.: Validation of a GATE model for the simulation of the Siemens PET Biograph 6 scanner. *Nuclear Instruments and Methods in Physics Research A (Accelerators, Spectrometers, Detectors and associated Equipment)* 571: 263-266, 2007
52. Liaparinos P., Kandarakis I., Cavouras D., Delis H., Panayiotakis G.: Modeling granular phosphor screens by Monte Carlo methods. *Medical Physics* 33, 4502-.. 2007
53. Karatopis A., Benekos O., Efstathopoulos E., Valais I., Kandarakis I., Kelekis N.: Molecular imaging through  $^1\text{H}$  MRS and MRSI in every day routine: improvements in various clinical applications and parameter optimization of spectroscopic imaging sequences. *Nuclear Instruments and Methods in Physics Research A* 571: 502-505, 2007
54. Efthimiou N., Kalivas N., Patatoukas G., Konstantinidis A., Valais I., Nikolopoulos D., Loudos G.,...Cavouras D. Panayiotakis G., Kandarakis I.: Investigation of the effect of the scintillator material on the overall x-ray detection system performance by application of analytical models. *Nuclear Instruments and Methods in Physics Research A* 571: 270-273, 2007
55. Valais I., Nikolopoulos D., Kalivas N., Gaitanis A., Loudos G., Sianoudis i., Giokaris N., Cavouras D., Dimitropoulos N., Nomicos C., Kandarakis I., Panayiotakis G.: A systematic study of the performance of  $\text{CsI:Tl}$  single-crystal scintillator under x-ray excitation. *Nuclear Instruments and Methods in Physics Research* 571: 343-345, 2007
56. Valais I., Kandarakis I., Nikolopoulos D., Michail C., David S., Loudos G., Cavouras D., Panayiotakis G.S.: Luminescence properties of  $(\text{Lu, Y})_2\text{SiO}_5\text{:Ce}$  and  $\text{Gd}_2\text{SiO}_5\text{:Ce}$  single crystal scintillators for x-ray imaging applications. *IEEE Transactions on Nuclear Science. TNS-54:* 11-18, 2007
57. Liaparinos P., Kandarakis I., Cavouras D., Delis H., Panayiotakis G.: Evaluation of the LSO powder phosphor by Monte Carlo methods: Comparison with  $\text{Gd}_2\text{O}_2\text{S:Tb}$  phosphor. *Medical Physics.* 34, 1724-1733, 2007

58. Valais I., David S., Michail C., Konstandinidis A., Kandarakis I., Panayiotakis G. Investigation of Luminescent properties of LSO:Ce, LYSO:Ce and GSO:Ce crystal scintillators under low energy gamma-ray excitation used in nuclear imaging. . Nuclear Instruments and Methods in Physics Research A,(Accelerators, Spectrometers, Detectors and associated Equipment), 501: 99-102, 2007
59. Michail C., David S., Liaparinos P., Valais I., Nikolopoulos D., Kalivas N., Toutountzis A., Cavouras D., Kandarakis I., Panayiotakis G. Evaluation of the imaging performance of LSO powder scintillator for use in X-ray mammography. Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment, 580, 558-561, 2007
60. Kalyvas N., Valais I., Nikolopoulos D., Konstantinidis A., Gaitanis A., Cavouras D., Nomicos C., Panayiotakis G., Kandarakis I. Light emission efficiency and imaging properties of YAP:Ce granular phosphor screens. Appl. Phys. A 89,443-449, 2007
61. Valais I., Michail C., David S., Panayiotakis G., Kandarakis I. A Comparative Study of the Luminescence Properties of LYSO:Ce, LSO:Ce, GSO:Ce and BGO Single Crystal Scintillators for Use in Medical X-Ray Imaging. Physica Medica. Υπό εκτύπωση. 2008
62. Valais I., Michail C., David S., Konstantinidis A. Kandarakis I., Panayiotakis G. Luminescence emission properties of (Lu,Y)2SiO5:Ce (LYSO:Ce) and (Lu,Y)AlO3:Ce (LuYAP:Ce) single crystal scintillators under x-ray medical imaging conditions. IEEE Transactions on Nuclear Science, TNS-55, 785-789, 2008.
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- 201.Valais I., David S., Michail C., Konstantinidis A., Kandarakis I. S., Panayiotakis G. S., Investigation of Luminescent Properties of LSO:Ce, LYSO:Ce and GSO:Ce Crystal Scintillators Under Low Energy  $\gamma$  - ray Excitation Used in Nuclear Imaging , 11th Vienna Conference on Instrumentation - VCI 2007 FEBRUARY 19-24 2007 PB 45.
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- 212.A. Konstantinidis, P. Liaparinos, G. Panayiotakis and I. Kandarakis, "Investigation of two heavy elements scintillators by Monte-Carlo methods", 4<sup>th</sup> International Conference Imaging Technologies in Biomedical Sciences (ITBS-2007), 22-28 September 2007, Milos, Greece.
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## **B. LIST OF FUNDED RESEARCH PROJECTS**

- ΕΠΕΑΕΚ II-«ARCHIMEDES»: «Investigation of phosphors-scintillators for use in radiation detectors of medical imaging systems», 01.02.2004-31.08.2006 (coordinator)
- Research and Education Comitee-TEI Athens-«ATHENA 2004»: «Simulation of Computed Tomography Breast Imaging: Effect of Detector Material and Recostruction Algorithm on Image Quality». (01/02/2005 – 31/12/2006) (coordinator).
- ΕΠΕΑΕΚ II-«ARCHIMEDES II»: «Experimental investigation and Monte Carlo simulation of radiation detector materials used in Diagnostic Radiology and Nuclear Medicine systems», 01.01.2005-31.12.2006
- ΕΠΕΑΕΚ II-«ARCHIMEDES»: «Development of phosphor films for use in high resolution near-infrared Optical Imaging», 01.02.2004-31.08. 2006
- ΕΠΕΑΕΚ II-«PYTHAGORAS» «Optimization of lesion dtectability in mammography by Monte Carlo techniques»
- ΕΠΕΑΕΚ II-«ARCHIMEDES»: «Development of a classification system for evoked potentials and intracranial currents using Support Vector Machines and Probabilistic Neural Networks (PNN)», 01. 02.2004-31.08.2006
- ΕΠΕΑΕΚ-«ARHIMEDES»: «Computer aided diagnosis system for thyroid cancer», 01.02.2004-31.08.2006
- ΕΠΕΑΕΚ II-«ARCHIMEDES»: «Investigation of factors affecting healthy and safe food production by advanced technological methods (food irradiation)», 01.02.2004-31.08.2006

- Greek Scholarships Foundation (IKY), Scholarships for post-doctoral research: “Applications of Monte Carlo methods on the investigation of Medical Imaging detector systems based on fluorescent materials of novel closed packing granular structure with grains in the range of nanoparticles” (coordinator I. Kandarakis, researcher P. Liaparinos), starting January 2011.
- ARHIMEDES III: (XDUALGNOSIS) NOVEL APPLICATIONS OF X-RAY DUAL ENERGY FOR EARLY DIAGNOSIS IN OSTEOPOROSIS, MAMMOGRAPHY AND ANGIOGRAPHY GEORGE FOUNTOS
- ARHIMEDES III: (NANOCARLO) EVALUATION OF NANOPHOSPHORS FOR MEDICAL IMAGING APPLICATIONS: MONTE CARLO SIMULATION AND EXPERIMENTAL EVALUATION OF A NANOPHOSPHOR-CMOS PROTOTYPE (IOANNIS KANDARAKIS)
- ARHIMEDES III: (SCoDo) EXPERIMENTAL EVALUATION OF NEW CO-DOPED SCINTILLATOR MATERIALS FOR USE IN COMBINED TOMOGRAPHIC IMAGING SYSTEMS (KONSTANTINOS KOURKOUTAS)

### **C. LIST OF SUPERVISED DOCTORATE DISSERTATIONS** (Member of the Supervising Committee)

1. P. Liaparinos: “Development of Computer software model for investigation of fluorescent materials used in Medical Imaging by Monte Carlo method”. University of Patras, Dept of Medical Physics
2. I. Valais: “Investigation of Cerium (Ce<sup>+3</sup>) activated single-crystal scintillators for use in radiation detectors”. University of Patras, Dept of Medical Physics
3. C. Michail: “Investigation of fluorescent screens imaging characteristics for use in digital detectors”. University of Patras, Dept of Medical Physics.
4. S. David: “Experimental evaluation of single-crystal and granular scintillators in medical imaging detectors: Application in an experimental prototype imaging system”. University of Patras, Dept of Medical Physics
5. K. Koutsofios: “Evaluation of Portal Imaging devices used in Radiation Therapy: Image Quality and Dosimetry”. University of Patras, Dept of Medical Physics
6. V. Spyropoulou: «Analytical Modeling of Computed Tomography Breast Imaging System», University of Patras, Dept of Medical Physics
7. E. Nirgianaki: «Development of a Therapy Planning Evaluation Method for using Theroluminescence Dosimetry ». University of Patras”. University of Patras, Medical Physics
8. K. Karpetas: «Simulation of Integrated Nuclear Medicine systems with Monte Carlo Methods», University of Patras, Medical Physics
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