

# MOUTSATSOS ARGYRIS

## Physicist, MSc, PhD in Medical Physics

Date of Birth : 22 April 1980  
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### EDUCATION

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12/2013: Ph.D. in Medical Physics, Medical Physics Laboratory, Athens Medical School, National and Kapodistrian University of Athens.  
12/2009: Professional license to practice Medical Physics.  
06/2008: M.Sc. in Medical Physics, Athens Medical School, National and Kapodistrian University of Athens.  
09/2005: B.Sc. in Physics, Physics Department, National and Kapodistrian University of Athens.

### EMPLOYMENT

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09/2008 – : Research Assistant, Medical Physics Laboratory, Athens Medical School, National and Kapodistrian University of Athens.  
07/2013 – 07/2014: Radiation therapy physicist at the 6th department of the Hellenic Social Insurance Institute  
05/2011 – 05/2012: Compulsory military service (Hellenic Air Force).  
10/2006 – 10/2007: Medical Physics trainee, “Aretaieion” Athens University Hospital (Radiation Therapy), “Attikon” Athens University Hospital (Diagnostic Radiology) and “Evangelismos” Athens General Hospital (Nuclear Medicine).

### RESEARCH INTERESTS

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- Dosimetric and geometric verification of contemporary, 3-dimensional radiation therapy techniques with emphasis on stereotactic radiosurgery/radiotherapy.
- Small and non-standard field dosimetry. Determination of appropriate correction factors for dosimeters commonly used in the clinical routine.
- Experimental dosimetry using the polymer gel – MRI dosimetry method as well as conventional dosimeters such as radiochromic films, TLDs, diode detectors, ion

chambers and alanine detectors.

- Assessment and characterization of the total geometric uncertainty in Gamma Knife radiosurgery applications. Development of geometric accuracy improvement techniques.
- Assessment and characterization of the spatial distortions inherent in MR images.

#### PARTICIPATION IN RESEARCH PROJECTS

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- “Prospective evaluations and end-user oriented tools to guide the brachytherapy community through a smooth transition to model based, individualized treatment planning dosimetry”

Source: Research Funding Program: Aristeia, co-financed by the European Social Fund-ESF and Greek national funds through an Operational Program of the National Strategic Reference Framework-NSRF.

Start – End: 03/2014 –

- “Experimental and computational determination of the dosimetric parameters required for the use of I125.S17plus I-125 source in clinical LDR permanent implant brachytherapy applications” .

Source: Eckert & Ziegler BEBIG GmbH, Berlin.

Start – End: 11/2013 – 03/2014.

- “A comparison of current and next generation treatment planning systems in terms of clinical significance in brachytherapy for cancer treatment”

Source: Hungary-Greece joint Research and Technological program.

Start – End: 10/2012 – 10/2014.

- “Output calibration and small field output factor measurements of the new IRIS secondary collimator of the CyberKnife system”.

Source: Accuray Inc., Sunnyvale, USA.

Start – End: 2011 – 2012.

- "Development and application of research dosimetry techniques to the quality assurance of radiation therapy in the clinical setting”.

Source: The Research Promotion Foundation’s Framework Programme for Research, Technological Development and Innovation - Desmi 2008, co-funded by the Republic of Cyprus and the European Regional Development Fund.

Start – End: 2009 – 2010.

- “Research proposal for the independent validation of Acuros based dosimetry calculations in brachytherapy”.

Source: Varian Medical Systems SA.

Start – End: 2008 – 2011.

- “Development of chemical dosimetry materials for clinical radiotherapy and radiology applications”.

Source: General Secretariat for Research and Technology – Poland-Greece joint Research and Technological program.

Start – End: 2007 – 2008.

#### THESES

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- “Three-dimensional dosimetry of contemporary radiation therapy techniques”, Ph.D. thesis, Medical School, National and Kapodistrian University of Athens, 2013.
- “Assessment of advanced MRI techniques in three-dimensional dosimetry of radiosurgery applications”, M.Sc. thesis, Medical School, National and Kapodistrian University of Athens, 2008.
- “Experimental dosimetry of small fields used in a Gamma Knife radiosurgery unit”, Diploma thesis, Physics Department, National and Kapodistrian University of Athens, 2005.

#### FOREIGN LANGUAGES

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- English (University of Cambridge, BULATS English Language Test, level C1).
- German (Goethe Institut, Zentrale Mittelstufenpruefung (ZMP), level C1).

#### SPECIFIC SKILLS

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- Scientific data processing and software development (Matlab, C++).
- Data processing and evaluation in 3D formalism.
- Medical image processing (DICOM).
- Basic experience in computational dosimetry using Monte Carlo simulation techniques (MCNP, EGSnrc).
- Studies in classical and electric guitar

#### PUBLICATIONS IN PEER REVIEWED SCIENTIFIC JOURNALS

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1. P. Karaiskos, **A. Moutsatsos**, E. Pappas, E. Georgiou, A. Roussakis, M. Torrens and I. Seimenis. “A Simple and Efficient Methodology To Improve Geometric Accuracy in Gamma Knife Radiation Surgery: Implementation in Multiple Brain Metastases”. *Int. J. Radiat. Oncol.* 2014;90(5):1234-41. doi:10.1016/j.ijrobp.2014.08.349.
2. **A. Moutsatsos**, E. Pantelis, P. Papagiannis and D. Baltas. “Experimental determination of the Task Group-43 dosimetric parameters of the new I25.S17plus <sup>125</sup>I brachytherapy

- source". *Brachytherapy*. 2014;13(6):618-24. doi:10.1016/j.brachy.2014.07.001.
3. **A. Moutsatsos**, P. Karaiskos, L. Petrokokkinos, L. Sakelliou, E. Pantelis, E. Georgiou, M. Torrens and I. Seimenis. "Assessment and characterization of the total geometric uncertainty in Gamma Knife radiosurgery using polymer gels". *Med. Phys.* 2013;40(3):031704. doi:10.1118/1.4789922.
  4. K. Zourari, E. Pantelis, **A. Moutsatsos**, L. Sakelliou, E. Georgiou, P. Karaiskos and P. Papagiannis. "Dosimetric accuracy of a deterministic radiation transport based <sup>192</sup>Ir brachytherapy treatment planning system. Part III: Comparison to Monte Carlo simulation in voxelized anatomical computational models". *Med. Phys.* 2013;40(1):011712. doi:10.1118/1.4770275.
  5. E. Pantelis, **A. Moutsatsos**, K. Zourari, L. Petrokokkinos, L. Sakelliou, W. Kilby, C. Antypas, P. Papagiannis, P. Karaiskos and E. Georgiou. "On the output factor measurements of the CyberKnife iris collimator small fields: Experimental determination of the  $k_{f_{clin},fmsr}^{Q_{clin},Q_{msr}}$  correction factors for microchamber and diode detectors". *Med. Phys.* 2012;39(8):4875-85. doi:10.1118/1.4736810.
  6. L. Petrokokkinos, K. Zourari, E. Pantelis, **A. Moutsatsos**, P. Karaiskos, L. Sakelliou, I. Seimenis, E. Georgiou and P. Papagiannis. "Dosimetric accuracy of a deterministic radiation transport based <sup>192</sup>Ir brachytherapy treatment planning system. Part II: Monte Carlo and experimental verification of a multiple source dwell position plan employing a shielded applicator". *Med. Phys.* 2011;38(4):1981-92. doi:10.1118/1.3567507.
  7. C. Loukas, N. Nikiteas, M. Kanakis, **A. Moutsatsos**, E. Leandros and E. Georgiou. "A Virtual Reality Simulation Curriculum for Intravenous Cannulation Training". *Acad. Emerg. Med.* 2010;17(10):1142-1145. doi:10.1111/j.1553-2712.2010.00876.x.
  8. **A. Moutsatsos**, P. Karaiskos, L. Petrokokkinos, K. Zourari, E. Pantelis, L. Sakelliou, I. Seimenis, C. Constantinou, A. Peraticou and E. Georgiou. "On the use of polymer gels for assessing the total geometrical accuracy in clinical Gamma Knife radiosurgery applications". *J. Phys. Conf. Ser.* 2010;250:012060. doi:10.1088/1742-6596/250/1/012060.
  9. E. Pantelis, **A. Moutsatsos**, K. Zourari, W. Kilby, C. Antypas, P. Papagiannis, P. karaiskos and E. Georgiou. "On the implementation of a recently proposed dosimetric formalism to a robotic radiosurgery system". *Med. Phys.* 2010;37(5):2369-79. doi:10.1118/1.3404289.
  10. K. Zourari, E. Pantelis, **A. Moutsatsos**, L. Sakelliou, E. Georgiou, P. Karaiskos and P. Papagiannis. "Dosimetric accuracy of a deterministic radiation transport based <sup>192</sup>Ir brachytherapy treatment planning system. Part I: Single sources and bounded homogeneous geometries". *Med. Phys.* 2010;37(2):649-61. doi:10.1118/1.3290630.
  11. **A. Moutsatsos**, L. Petrokokkinos, P. Karaiskos, P. Papagiannis, E. Georgiou, K. Dardoufas, P. Sandilos, M. Torrens, E. Pantelis, I. Kantemiris, L. Sakelliou and I. Seimenis. "Gamma Knife output factor measurements using VIP polymer gel dosimetry". *Med. Phys.*

2009;36(9):4277-87. doi:10.1118/1.3183500.

12. **A. Moutsatsos**, L. Petrokokkinos, K. Zourari, P. Papagiannis, P. Karaiskos, K. Dardoufas, J. Damilakis, I. Seimenis and E. Georgiou. "Gamma Knife relative dosimetry using VIP polymer gel and EBT radiochromic films". *J. Phys. Conf. Ser.* 2009;164:012053. doi:10.1088/1742-6596/164/1/012053.
13. L. Petrokokkinos, **A. Moutsatsos**, P. Karaiskos, V. Kouridou, E. Pantelis, P. Papagiannis and I. Seimenis. "On the use of VIP gel dosimetry in HDR brachytherapy". *J. Phys. Conf. Ser.* 2009;164:012051. doi:10.1088/1742-6596/164/1/012051.
14. I. Seimenis, **A. Moutsatsos**, L. Petrokokkinos, I. Kantemiris, O. Benekos, E. Efstathopoulos, P. Papagiannis, V. Spevacek, J. Semnicka and P. Dvorak. "The use of high field strength and parallel imaging techniques for MRI-based gel dosimetry in stereotactic radiosurgery". *J. Instrum.* 2009;4(07):P07004. doi:10.1088/1748-0221/4/07/P07004.
15. I.A. Tsalafoutas, G.A. Blastaris, **A.S. Moutsatsos**, P.S. Chios and E.P. Efstathopoulos. "Correlation of image quality with exposure index and processing protocol in a computed radiography system". *Radiat. Prot. Dosimetry* 2008;130(2):162-71. doi:10.1093/rpd/ncm493.

#### ANNOUNCEMENTS IN INTERNATIONAL SCIENTIFIC CONFERENCES

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1. **A. Moutsatsos**, E. Pantelis, E. Pappas and P. Papagiannis, "*Experimental dosimetry for model-based <sup>192</sup>Ir HDR brachytherapy treatment planning*", The 8<sup>th</sup> European Conference on Medical Physics (ECMP 2014), Athens Greece, 11-13/09/2014, *Physica Medica*, 2014; 30(Sup.1):e36. doi:10.1016/j.ejmp.2014.07.112.
2. L. Petrokokkinos, **A. Moutsatsos**, E. Pappas, E. Pantelis, P. Karaiskos and P. Papagiannis, "*Virtual DICOM-CT based phantoms for the assessment of radiation therapy TPS volumetric accuracy*", The 8<sup>th</sup> European Conference on Medical Physics (ECMP 2014), Athens Greece, 11-13/09/2014, *Physica Medica*, 2014; 30(Sup.1):e24. doi:10.1016/j.ejmp.2014.07.082.
3. E. Pappas, **A. Moutsatsos**, P. Karaiskos, E. Pantelis, E. Georgiou, M. Torrens and I. Seimenis, "*Stereotactic frame induced geometric distortions in MR images employed in Gamma Knife radiosurgery applications*", The 8<sup>th</sup> European Conference on Medical Physics (ECMP 2014), Athens Greece, 11-13/09/2014, 2014; 30(Sup.1):e68. doi:10.1016/j.ejmp.2014.07.207.
4. E. Pappas, **A. Moutsatsos**, E. Pantelis, C. Paraskevopoulou, E. Georgiou, and P. Karaiskos, "*An EGSnrc-based model of the Gamma Knife PERFEXION unit for small field dosimetric calculations*", The 8<sup>th</sup> European Conference on Medical Physics (ECMP 2014), Athens Greece, 11-13/09/2014, 2014; 30(Sup.1):e108-109. doi:10.1016/j.ejmp.2014.07.309.
5. **A. Moutsatsos**, L. Petrokokkinos, E. Pappas, E. Pantelis, E. Georgiou, M. Torrens and P.

- Karaiskos, "Assessment of Gamma Knife small field output factors: A multi-detector approach", International Conference on Medical Physics (ICMP) 2013, Brighton UK, 1-4/09/2013, *Medical Physics International Journal*, 2013; vol. 1(No.2):p403.
6. **A. Moutsatsos**, P. Karaiskos, E. Karavasilis, E. Pappas, E. Pantelis, E. Georgiou, I. Seimenis and M. Torrens, "A methodology for assessing and improving the total geometric accuracy in gamma knife radiosurgery", 11th International Stereotactic Radiosurgery Society Congress (ISRS), Toronto, Canada, 16-20/06/2013.
  7. E. Pappas, **A. Moutsatsos**, I. Seimenis, E. Karavasilis, M. Torrens, E. Georgiou and P. Karaiskos, "A new phantom for the assessment of MR-related geometric distortions affecting gamma knife radiosurgery", International Conference on Medical Physics (ICMP) 2013, Brighton UK, 1-4/09/2013, *Medical Physics International Journal*, 2013; vol. 1(No.2):p461.
  8. L. Petrokokkinos, **A. Moutsatsos**, I. Seimenis, P. Karaiskos and P. Papagiannis, "QA in contemporary intracranial radiotherapy techniques: A holistic method employing a multitude of 1D, 2D and 3D dosimeters", International Conference on Medical Physics (ICMP) 2013, Brighton UK, 1-4/09/2013, *Medical Physics International Journal*, 2013; vol. 1(No.2):p682.
  9. **A. Moutsatsos**, L. Petrokokkinos, K. Zourari, C. Antypas, P. Papagiannis, P. Karaiskos, E. Georgiou, I. Seimenis and E. Pantelis, "High Precision output factor results for the Cyberknife Iris collimator small fields", ESTRO 31, Barcelona, Spain, 9-13/05/2012, *Radiother. Oncol.*, 2012; 103(Sup.1):S14-S15. doi:10.1016/S0167-8140(12)70376-6.
  10. P. Karaiskos, E. Koutsouveli, **A. Moutsatsos**, L. Petrokokkinos, K. Zourari, P. Papagiannis, I. Seimenis, C. Constantinou, P. Sandilos and E. Georgiou, "Measurement of the clinical accuracy of Elekta Axesse image-guided stereotactic radiotherapy system", 10th International Stereotactic Radiosurgery Society Congress (ISRS 2011) Brain & Body Radiosurgery, Paris, France, 08-12/05/2011.
  11. K. Zourari, E. Pantelis, **A. Moutsatsos**, E. Roussou, E. Georgiou, L. Sakelliou, P. Karaiskos and P. Papagiannis, "A virtual phantom/DICOM protocol-based QA procedure for contemporary HDR <sup>192</sup>Ir brachytherapy TPS", ESTRO Anniversary, London, United Kingdom, 8-12/05/2011, *Radiother. Oncol.*, 2011; 99(Sup.1):S404-405. doi:10.1016/S0167-8140(11)71209-9.
  12. **Moutsatsos**, P. Karaiskos, E. Georgiou, C. Constantinou, D. M. Andreopoulos, D. Dimitriadou, A. Peraticou and I. Seimenis, "Characterization and correction of MR-related geometrical distortions in Gamma Knife radiosurgery applications using polymer gels", European Conference on Radiology (ECR 2011), Vienna, Austria, 03-07/03/2011. doi:10.1594/ecr2011/C-2175.
  13. **A. Moutsatsos**, W. Kilby, K. Zourari, P. Karaiskos, P. Papagiannis and E. Pantelis, "Reference dosimetry and small field output factor measurements in a CyberKnife robotic radiosurgery system: Combining multi-detector measurements with Monte Carlo simulation and theoretical assessments", ESTRO 29, Barcelona, Spain, 12-16/09/2010,

*Radiother. Oncol.*, 2010; 96(Sup.1):S24. doi:10.1016/S0167-8140(10)80024-6.

14. **A. Moutsatsos**, P. Karaiskos, L. Petrokokkinos, K. Zourari, E. Pantelis, L. Sakelliou, I. Seimenis, C. Constantinou, A. Peraticou and E. Georgiou, “*On the use of polymer gels for assessing the total geometrical accuracy in clinical Gamma Knife radiosurgery applications*”, The 6<sup>th</sup> International Conference in 3D Radiation Dosimetry (IC3DDose), Hilton Head Island, South Carolina, USA, 22-26/08/2010, *J. Phys.: Conf. Ser.*, 2010; 250(5): 012060. doi:10.1088/1742-6596/250/1/012060.
15. Ι. Σεϊμένης, Ε. Ηρακλέους, Χ. Κωνσταντίνου, Δ. Ανδρεόπουλος, Α. Αρίτκαν, Α. Μουτσάτσος, Λ. Πετροκόκκινος, Π. Παπαγιάννης, Μ. Τόρρενς και Π. Καραϊσκος, “*Ποιοτικός έλεγχος εικόνων μαγνητικής τομογραφίας για το σχεδιασμό και την πειραματική επιβεβαίωση σύγχρονων ακτινοθεραπευτικών εφαρμογών*”, 3<sup>ο</sup> Κυπροελλαδικό Συνέδριο Ακτινολογίας, Λεμεσός, Κύπρος, 05/2010.
16. **Moutsatsos**, L. Petrokokkinos, K. Zourari, P. Papagiannis, P. Karaiskos, K. Dardoufas, J. Damilakis, I. Seimenis and E. Georgiou, “*Gamma Knife relative dosimetry using VIP polymer gel and EBT radiochromic films*”, The 5<sup>th</sup> International Conference on Radiotherapy Gel Dosimetry (DOSGEL2008), Hersonissos of Crete, Greece, 29/09/2008-03/10/2008, *J. Phys.: Conf. Ser.*, 2009; 164(01):P012053. doi:10.1088/1742-6596/164/1/012053.
17. L. Petrokokkinos, **A. Moutsatsos**, P. Karaiskos, V. Kouridou, E. Pantelis, P. Papagiannis and I. Seimenis, “*On the use of VIP gel dosimetry in HDR brachytherapy*”, The 5<sup>th</sup> International Conference on Radiotherapy Gel Dosimetry (DOSGEL2008), Hersonissos of Crete, Greece, 29/09/2008-03/10/2008, *J. Phys.: Conf. Ser.*, 2009; 164(01):P012051. doi:10.1088/1742-6596/164/1/012051.
18. **A. Moutsatsos**, L. Petrokokkinos, I. Kantemiris, O. Benekos, E. Efstathopoulos, P. Papagiannis, V. Spevacek, J. Semnicka, P. Dvorak and I. Seimenis, “*The use of high field strength and parallel imaging techniques for MRI-based polymer gel dosimetry of radio-surgical beams*”, 4<sup>th</sup> International Conference on Imaging Technologies in Biomedical Sciences (ITBS 2007) “From Medical Images to Clinical Information – Bridging the Gap”, Milos island, Greece, 22-28/09/2007, *JINST*, 2009; 4(07):P07004. doi:10.1088/1748-0221/4/07/P07004.