

PERSONAL INFORMATION

Foteini Kariotou



2nd Par. Palaion Patron Germanou,
Paralia Patron
GR - 26500,
Patras, GREECE

Date of birth 22/06/1965 | Nationality Greek

Marital status Married to Alexis Matthaïou (1990)
Two daughters: Vasiliki (1992) and Maria-Sotiria (1995)

PROFFESIONAL STATUS

Assistant Professor,
School of Science and Technology, Hellenic Open University

in the field of “Mathematical Models in Natural Sciences” (2009-today)

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EDUCATION AND TRAINING

- | | |
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| 2002 | <p>PhD in Applied Mathematics</p> <p>Department of Chemical Engineering, University of Patras, Greece</p> <p>Phd thesis on “Mathematical Problems on the Electromagnetic Activity of the Human Brain”</p> |
| 1990 | <p>Bachelor degree in Mathematics</p> <p>Department of Mathematics, University of Patras, Greece
(grade 8.35 out of 10)</p> |

AWARDS

- National Academy of Athens Award for the best paper in Applied Analysis (2004).
- Scholarship from ICEHT (Institute of Chemical Engineering and High Temperatures, Patras) during all five years of postgraduate studies (1997-2002).
- Scholarship awarded from National Scholarship Foundation (IKY) at the second year of postgraduate studies (Highest scores in graduate courses).

Language(s)

Greek (Mother tongue) English (B2_ First Certificate, University of Cambridge), French (Highschool level education)

Areas of scientific interest

- Boundary Value Problems in Ellipsoidal Geometry
- Brain Imaging Techniques (EEG, MEG)
- Mathematical Analysis of Biomedical Models – Tumour Growth
- Direct and Inverse Scattering Problems
- Wave Theory in Acoustics, Electromagnetism and Thermoelasticity
- Partial Differential Equations of Mathematical Physics

TEACHING EXPERIENCE

2009 - today	Teaching and coordination of the postgraduate Module on “Mathematical models in natural sciences” of the Master program “Postgraduate studies in Mathematics”, Hellenic Open University
2008-2009	Teaching of the Mathematics courses of the first year of the undergraduate program “Studies in Natural Sciences” in the Hellenic Open University
2008-2010	Teaching Assistance of the Applied Mathematics courses of the postgraduate studies in the department of Chemical Engineering, University of Patras
2007-2008	Teaching on the first year graduate courses on Mathematical Analysis and Linear Algebra at the Department of Renovation and Restoration of Buildings, of the Technological Educational Institute of Patras
2005-2007	Teaching of the Mathematics courses of the first year of graduate studies in the department of Chemical Engineering, University of Patras
2005-2006	Teaching of Mathematical Analysis and Linear Algebra at the postgraduate interdisciplinary program “Informatics for Life sciences” of the University of Patras
2003-2005	Teaching Assistance on Postgraduate courses on Mathematical Analysis and Linear Algebra and on Applied Mathematics, University of Patras
2002-2006	Teaching of the Mathematics courses of the second year of the undergraduate program “Studies in Natural Sciences” in the Hellenic Open University
2002-2003	Teaching in High school
1996-today	Active participation in the Applied Mathematics Seminar, Department of Chemical Engineering, University of Patras.

Phd supervision

2011- today	Sinikis Dimitris, “Far field expansion and low frequency approximation in acoustic scattering theory”
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Master thesis supervision

2009 - 2010	Parathira Maria, “Mathematical modelling of avascular tumour growth from 20 th to 21 st century”, Hellenic Open University
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2010-2011	Graikou Aikaterini, "On the effect of oblate spheroidal symmetry on avascular tumour growth modelling", Hellenic Open University
2010-2011	Kouni Styliani, "Studying avascular tumour development in prolate spheroidal geometry", Hellenic Open University
2010-2011	Sarafopoulou Charikleia, "Recovering the characteristics of a spherical scatterer via an acoustic plane wave or point source excitation", Hellenic Open University
2011-2012	Diamantopoulos Nikolaos, "On the spectral decomposition of the Laplace operator in the ellipsoidal coordinate system", Hellenic Open University
2012-2013	Petropoulos Athanasios "On the well posedness of mathematical problems related to spherical models of avascular tumour growth", Hellenic Open University
2012-2013	De Witte Rita, "Creating an e-course on Hyperbolic PDEs, with long distance learning methods", Hellenic Open University
2013-2014	Batzios Athanasios, "Studying the effects of an inhibitory agent on cancer cells of a benign cylindrical tumor", Hellenic Open University
2013-2014	Manolis Nikolaos, "Creating an e-course on Integral equations, using the LAMS platform", Hellenic Open University
2014-2015	Alexiou Ioannis, "Introduction to the mathematical modelling of breast cancer", Hellenic Open University
2015-2016	Marmaras Chrysovalantis, "Parametric analysis of the ellipsoidal model of Electroencephalography", Hellenic Open University (in progress)
2015-2016	Tsagaropoulou Olga, "Mathematical issues on the imaging techniques of the brain_the case of EEG-MEG", Hellenic Open University (in progress)
2015-2016	Kakirdaki Konstantia, "On the use of the far field expansion theorem in Electromagnetic scattering from a spherical scatterer", Hellenic Open University (in progress)

Administration

2011 - today	Departmental Coordinator of the ERASMUS+ program for the School of Science and Technology (SST), Hellenic Open University (HOU)
2009- today	Member of the committee for evaluating scientific staff participating in Study programs of SST, HOU
2011-2015	Member of the scientific committee of the Internal Evaluation Unit of HOU
2014-2015	Member of the committee for evaluating several resources in HOU

Participation in research projects

- 2012 – 2015 “Source localization and stability analysis in Electro-Magneto-Encephalography”, in the frame of the program “Aristeia”, funded from National Educational Ministry, member of the main research team.
- 2012 – 2014 “Mathematical and computational study of the flow field of biological fluids for therapeutic design in clinically important conditions”, in the frame of the program “Archimedes III”, funded from National Educational Ministry, member of the research team
- 2005 – 2007 “Analysis of the Ellipsoidal Model in Electro-magneto-encephalography” in the frame of the Program ”Pythagoras II”, funded from National Educational Ministry, main postdoctoral researcher.

Books and educational material

“Mathematical models in Medical Physics, Volume II: Mathematical modelling of tumour growth”, with M. Hadjinicolaou, HOU, in press (250 pages).

Hypertext educational material on Ordinary Differential Equations for the mathematical module of the graduate program “Studies in Natural Sciences”, (design and development), HOU (150 pages).

Lecture notes on Partial Differential equations, on Applied Functional Analysis and on Integral equations, for the postgraduate module “Mathematical models in natural sciences” (over 500 pages) .

PUBLICATIONS

Phd dissertation “Mathematical Problems on the Electromagnetic Activity of the Human Brain”, Department of Chemical Engineering, University of Patras, 2002.

Papers in international peer reviewed journals

1. “On the Geselowitz Formula in Biomagnetics”, with G. Dassios, Quarterly of Applied Mathematics, 61(2), p.p. 387-400, 2003.
2. “Magnetoencephalography in Ellipsoidal Geometry”, with G. Dassios, Journal of Mathematical Physics, 44, p.p. 220-241, 2003.
3. “On the Mathematics of EEG and MEG in Spheroidal Geometry”, Bulletin of the Greek Mathematical Society, 47, p.p. 117-135, 2003.
4. “On the Exterior Magnetic Field and Silent Sources in Magnetoencephalography”, with G. Dassios, Abstract and Applied Analysis, 4, p.p. 307-314, 2004.
5. “Electroencephalography in Ellipsoidal Geometry”, Journal of Mathematical Analysis and its Applications, 290, p.p. 324-342, 2004.

6. "Confocal Ellipsoidal Boundaries in EEG Modeling", with G. Kamvyssas, *Bulletin of the Greek Mathematical Society*, 50, p.p.119-133, 2005.
7. "The Complete Ellipsoidal Shell Model in EEG Imaging", with S. Giapalaki, *Abstract and Applied Analysis*, vol. 2006, article ID 57429, doi: 10.1155/aaa, p.p. 1-18.
8. "The Direct MEG Problem in the Presence of an Ellipsoidal Shell Inhomogeneity", with G. Dassios, *Quarterly of Applied Mathematics*, LXIII, p.p. 601-618, 2005.
9. "On the Non-Uniqueness of the Inverse MEG Problem", with G. Dassios and A. Fokas, *Inverse Problems*, 21, L1-L5, 2005.
10. "The Exterior Magnetic Field for the Multilayer Ellipsoidal Model of the Brain", with G. Dassios and S. Giapalaki, *Quarterly Journal of Mechanics and Applied Mathematics*, 2007, doi: 10.1093/ qjman/ hb1022, p.p. 1-25.
11. "The Fluid-Core Model in Electromagnetic Brain Activity", with D. Hadjiloizi, *Bulletin of the Greek Mathematical Society*, 54, pp. 257-265, 2007.
12. "The Octapolic Ellipsoidal Term in Magnetoencephalography", with G. Dassios and D. Hadjiloizi, *Journal of Mathematical Physics*, 50, 013508, 2009. [Επελέγη και αναδημοσιεύτηκε στο ηλεκτρονικό περιοδικό *Virtual Journal of Biological Physics Research*, Volume 17, Issue 2, 2009].
13. "Tackling Magnetoencephalography with particle Swarm Optimization", with G. Dassios, K. Parsopoulos and M. N. Vrahatis, *Int. J. Bio-Inspired Computation*, 1, Nos.1/2, pp. 32-49, 2009.
14. "Mathematical Modeling of the Avascular Ellipsoidal Tumour Growth", with B.D. Sleeman, G. Dassios and M. N. Tsampas, *Quarterly of Applied Mathematics*, 70, p.1-24, (2012), <http://dx.doi.org/10.1090/S0033-569X-2011-01240-2>.
15. "On the Kernel Space for the Bilaplacian Operator", with G. Dassios, *Bulletin of the Greek Mathematical Society*, p.161-174, 2010.
16. "On the effect of 3D anisotropic Tumour Growth on Modelling the nutrient Distribution in the interior of the tumour", with M. Hadjinicolaou, *Bulletin of the Greek Mathematical Society*, 57, p.189-197, 2010.
17. "Applied Mathematics in open Distance Education", *Open Education, The Journal for Open and Distance Education and Educational Technology*, 8, 1, pp 111-118, 2012.
18. "The avascular tumour growth in the presence of inhomogeneous physical parameters imposed from a finite spherical nutritive environment", with P. Vafeas, *International Journal of Differential Equations*, Volume 2012, Article ID 175434, 25 pages, doi:10.1155/2012/175434, 2012.
19. "Invariant Vector Harmonics. The Ellipsoidal Case", with G. Dassios and P. Vafeas, *Journal of Mathematical Analysis and Applications*, 405, p. 652-660, 2013.
20. "Mathematical modeling of tumour growth in inhomogeneous spheroidal environment", with P. Vafeas and P.K. Papadopoulos, *International Journal of Biology and Biomedical Engineering*, 8, p. 132-141, 2014.
21. "Estimates for the low-frequency electromagnetic fields scattered by two adjacent metal spheres in a lossless medium", with P. Vafeas and D. Lesselier, *Mathematical Methods in the Applied Sciences*, DOI:10.1002/mma.3359, 38, p. 4210-4237, 2015 (published on line 22/12/2014).
22. "An algebraic calculation method for the acoustic low frequency expansion", with D. Sinikis, *Journal of Mathematical Analysis and Applications*, 424, p.1506-1529, DOI: 10.1016/j.jmaa.2014.12.008, 2015.
23. "Revisiting a numerical implementation of the EEG problem in ellipsoidal geometry", with G. Dassios, M. Doschoris, J. Hatjigeorgiou and P. Vafeas, *Pioneer Journal of Advances in Applied Mathematics*, 14, 1-2, p. 35-51, 2015.
24. "Quantifying errors during the source localization process in Electroencephalography. Part 1: Confocal systems", with M. Doschoris, *The IMA Journal of Applied Mathematics*, submitted, 2015

25. “An algebraic formula for the accelerated computation of the low frequency scattering coefficients: the case of the acoustically soft sphere”, with M. Doschoris and D. Sinikis, *Applied Mathematics and Computation*, 275, p. 13-23, DOI: 10.1016/j.amc.2015.11.044, (published on line 12/12/2015), 2016.
26. “Quantifying errors during the source localization process in Electroencephalography. Part 2: Non-confocal systems”, with M. Doschoris, *Journal des Mathématiques Pures et Appliquées*, submitted, 2016.
27. “An accelerated derivation of the acoustic low frequency expansion: the penetrable sphere, with D. E. Sinikis, *Mathematical Methods in the Applied Sciences*, accepted, 2016.
28. “Mathematical analysis of the avascular ellipsoidal tumour growth within a nutritive environment”, with P. Vafeas and G. Fragoyannis, in preparation

Papers in peer reviewed
conference proceedings

1. “On the Electroencephalography (EEG) Problem for the Ellipsoidal Brain Model”, with G. Kamvyssa, *Proceedings of the 6th International Conference of the HSTAM*, 2, p.p.222-226, 2001.
2. “The Magnetoencephalography (MEG) Problem for a Genuine 3-D Brain Model”, with G. Dassios, *Proceedings of the 5th International Workshop on Mathematical Methods in Scattering Theory and Biomedical Technology*, p.p.289-297, 2001.
3. “The Effect of an Ellipsoidal Shell on the Direct EEG Problem”, with G. Dassios, *Proceedings of the 6th International Workshop on Mathematical Methods in Scattering Theory and Biomedical Technology*, p.p. 495-503, 2003.
4. “Analysis of EEG images”, with G. Dassios, S. Giapalaki and N. Kandyli, *Proceedings of the 7th International Workshop on Mathematical Methods in Scattering Theory and Biomedical Technology*, p.p. 304-307, 2005.
5. “On the Ellipsoidal Growth of Tumors”, with G. Dassios and M. Tsampas, *Proceedings of the 8th International Workshop on Mathematical Methods in Scattering Theory and Biomedical Technology*, p.p. 254-260, 2007.
6. “The Fluid Core Model of MEG Revisited: A Comparison with the Homogeneous Case”, with D. Hadjiloizi, *Proceedings of the 8th International Workshop on Mathematical Methods in Scattering Theory and Biomedical Technology*, p.p. 141-149, 2007.
7. “Reflection Of Thermoelastic Plane Waves In Anisotropic Thermoelastic Medium”, with V. Kostopoulos and G. Koskoviti, *Advanced Topics in Scattering Theory and Biomedical Engineering*, (Proceedings of the 9th International Workshop on Mathematical Methods in Scattering Theory and Biomedical Technology), p.p. 322-328, 2009.
8. “Extension of the Greenspan model to asymmetric tumour growth” with G. Dassios, *Proceedings of the 10th International Workshop on Biomedical Engineering*, 2011, IEEE, DOI: [10.1109/IWBE.2011.6079052](https://doi.org/10.1109/IWBE.2011.6079052)
9. «Mathematical modelling of the avascular tumour growth in oblate spheroidal shape-the inhibitor problem», with A. Graikou, *Proceedings of the 28th National Conference on Mathematical Modelling, HMS*, p.p. 219-242, 2011.
10. «Studying avascular tumour growth in spherical geometry» with S. Kouni, *Proceedings of the 28th National Conference on Mathematical Modelling, (HMS)*, p.p. 242-260, 2011.

11. “Applied Mathematics in open Distance Education”, Open Education, The Journal for Open and Distance Education and Educational Technology, 8, 1, pp 111-118, 2012.
12. “Mathematical modeling of the evolution of the exterior boundary in spheroidal tumour growth”, with P. Vafeas and P. Papadopoulos, Recent Advances in Mathematics, Statistics and Economics (Proceedings of the 2014 International Conference on Pure mathematics- Applied Mathematics, Venice, Italy), pp. 49-56, 2014.

Citations, metrics

- There are 198 citations on the published work, from which 118 do not include self citations, according to Scopus, June 2016
- h- index= 8 (Scopus, June 2016)

CONFERENCES

Presentations in Conferences
providing only book of abstracts

1. “Anisotropic Effects in Magnetoencephalography (MEG)”, International Conference on Differential and Difference Equations and Applications, Book of Abstracts, p.33, Patras, Greece, 2002.
2. “Magnetoencephalography for a Realistic Geometrical Model of the Brain”, with G. Dassios, K. Kotzialis and V. Kostopoulos, Third European Symposium in Biomedical Engineering and Medical Physics, University of Patras, Book of Abstracts p.p. 22, 2002.
3. “Ellipsoidal eigen-expansions in anisotropic electroencephalography”, with G. Dassios and S. Giapalaki, 10th Panhellenic Conference in Mathematical Analysis, Athens, 2004.
4. “On a hybrid approach for the Forward Electroencephalography problem”, with S. Giapalaki and N. Kandyli, 5th Panhellenic Conference in Chemical Engineering, Thessaloniki, 2005.
5. “MEG one-shell with a dipole in the shell”, with D. Hadjiloizi, International Conference in Modern Mathematical Methods in Science and Technology, Island of Paros, 2006.
6. “On the Nutrient Distribution Profile in Ellipsoidal Tumour Growth”, with M. Hadjinicolaou, International Conference in Modern Mathematical Methods in Science and Technology, Island of Poros, 2009.
7. “Vector Ellipsoidal Expansions for the Electric and Magnetic Lead Dyadics”, with G. Dassios, International Conference in Modern Mathematical Methods in Science and Technology, Island of Poros, 2009
8. “Applied mathematics in open distance education”, 6th ICODL, Loutraki, 2011.
9. “On the anisotropic effect of a transversally isotropic pressure field on oblate spheroidal tumour growth”, with P. Vafeas and A. Graikou, Modern Mathematical Methods in Science and Technology, Kalamata, 2012.
10. “On the nutrient distribution in an oblate spheroidal cancer tumour growing inside an inhomogeneous environment”, with P. Vafeas and P. Papadopoulos, 10th HSTAM International Congress on Mechanics, Chania, Crete, Greece, 25 – 27 May, 2013.
11. “Analysis of Error and bounds in Electroencephalography, with G. Dassios, M. Doshoris and V. Panagiotopoulou, 13th IEEE International Conference on BioInformatics and BioEngineering, Chania, Crete, Greece, 10-13 November, 2013.
12. “Developing an Algorithmic Framework Tackling Boundary Value Problems in Ellipsoidal Geometry: The Case of EEG. with M. Doschoris, G. Dassios, P. Vafeas and I.K. Chatjigeorgiou, 2nd International Conference on Recent Advances in Pure and Applied Mathematics, Istanbul, Turkey, 2015.

13. "On the low frequency coefficients via the Atkinson Wilcox theorem: the transmission scattering problem, with D. E. Sinikis, Modern Mathematical Methods in Science and Technology, Kalamata, 2015.
14. "Analytical expansions for the Stress and the Torque exerted by a viscous fluid on a Red Blood Cell, with M. Hadjinicolaou, G. Dassios, G. Kamvyssas, Modern Mathematical Methods in Science and Technology, Kalamata, 2015.

Attendance in Conferences

1. 5th International Conference of the Hellenic Society of Theoretic and Applied Mechanics, Ioannina, Greece, 27-30 August 1998.
2. 4th International Workshop on Mathematical Methods in Scattering Theory and Biomedical Technology, Perdica, Greece, 8-10 October 1999.
3. 6th International Conference of the Hellenic Society of Theoretic and Applied Mechanics, Thessalonica, Greece, 19-21 July 2001.
4. 5th International Workshop on Mathematical Methods in Scattering Theory and Biomedical Technology, Corfu, Greece, 18-19 October 2001.
5. International Conference on Differential Difference Equations and other Applications, Patras, Greece, 1-5 July 2002.
6. Third European Symposium in Biomedical Engineering and Medical Physics, Patras, September, 2002.
7. 6th International Workshop on Mathematical Methods in Scattering Theory and Biomedical Technology, Tsepelovo, Greece, 17-21 September 2003.
8. 10th National Conference on Mathematical Analysis, Athens, Greece, 30 September- 02 October 2004.
9. 5th National Scientific Conference on Chemical Engineering, Thessalonica, 26-28 May 2005.
10. 7th International Workshop on Mathematical Methods in Scattering Theory and Biomedical Technology, Nymfaio, Greece, 8-11 September 2005.
11. 1st International Conference on Modern Mathematical Methods in Science and Technology, Island of Paros, 07-09 September 2006.
12. 8th International Workshop on Mathematical Methods in Scattering Theory and Biomedical Technology, Island of Lefkada, Greece, 27-29 September 2007.
13. 2nd International Conference in Modern Mathematical Methods in Science and Technology, Island of Poros, 03-05 September 2009
14. 9th International Workshop on Mathematical Methods in Scattering Theory and Biomedical Technology, Patras, Greece, 9-11 October 2009.
15. 10th International Workshop on Biomedical Engineering, Kos, Greece, 5-7 October 2011.
16. 6th International Conference in Open and Distance Learning, Loutraki, 4-6 November 2011.
17. 28th National Conference on Mathematical Modelling, Hellenic Mathematical Society, Athens, 11-13 November 2011.
18. 3rd International Conference on Modern Mathematical Methods in Science and Technology, Kalamata, August 26-28, 2012.
19. 10th HSTAM International Congress on Mechanics, Chania, Crete, Greece, 25 – 27 May, 2013
20. 13th IEEE International Conference on Bioinformatics and BioEngineering, Chania, Crete, Greece, November 10-13, 2013
21. The 2014 International Conference on Pure mathematics- Applied Mathematics, Venice, Italy, 15-17 March 2014.
22. International Conference on Recent Advances in Pure and Applied Mathematics, Instambul, Turkey, 3-6 June 2015.
23. 4th International Conference on Modern Mathematical Methods in Science and Technology, Kalamata, August 28 – September 2, 2015.

- Seminars** Active participation and/ or attendance to weekly seminars and/ or workshops at the Applied Mathematics laboratory of the Department of Chemical Engineering, University of Patras, since 1997 until today, nonstop. Topics covered:
- Mathematical methods on wave propagation, forward and inverse and scattering theory
 - Ellipsoidal geometry and analysis in the ellipsoidal coordinate system
 - Mathematical Theory of Wavelets
 - Mathematical theory of Imaging techniques: EEG, MEG, MRI
 - Mathematical modelling of tumor growth
 - Perturbation methods
 - Complex analysis
 - Asymptotic analysis
 - Fractional calculus
- Reviewer to the journals**
- Journal of Physics A: Mathematics and General, IOP publishing
 - Inverse Problems, IOP publishing
 - International Journal for numerical methods in biomedical Engineering, Wiley InterScience
 - Mathematical Methods in the Applied Sciences, Wiley & Sons
 - 5. Applied Mathematics, Scientific Research Publishing
 - 6. International Journal of Differential Equations. Hindawi