CURRICULUM VITAE

Name : GEORGIOS T. KOSSIORIS
Department of Mathematics and Applied Mathematics
University of Crete
71003 Heraklion, Crete

Place and date of birth : Athens 1962

EDUCATION

1991 PhD in Applied Mathematics , Division of Appl. Mathematics, Brown University.
1987 MSc in Applied Mathematics, Division of Appl. Mathematics, Brown University.
1986 Diploma in Naval Architecture and Marine Engineering, National Technical Univ. of Athens.

ACADEMIC POSITIONS

September 2020 - present	Director of the Laboratory of Applied Mathematics, Univ. of Crete.
July 2012 - present	Professor, Dept. of Mathematics and Applied Mathematics, Univ. of Crete.
January 2002 - July 2012	Associate Professor, Dept. of Mathematics, Univ. of Crete.
January 1997 - December 2001	Assistant Professor Dept. of Mathematics, Univ. of Crete
March 1995 - December 1996	Visiting Assistant Professor Dept. of Mathematics, Univ. of Crete
September 1993 - November 1994	Visiting Assistant Professor Dept. of Mathematics, Univ. of Crete
September 1990 - August 1993	Zeev Nehari Visiting Assistant Professor, Department of Mathematics, Carnegie Mellon University
September 1987 - August 1990	Teaching/Research Assistant, Division of Applied Mathematics, Brown University, Providence, USA.
September 1986 - AUgust 1987	University Fellow, Division of Applied Mathematics, Brown University, Providence, USA.

RESEARCH AREA: Partial differential equations and applications

PUBLICATIONS

1. *Series expansions of solutions of plane elliptic partial differential equations in domains of arbitrary shape,* (with G. A. Athanassoulis) Applicable Analysis **27**, (1988), 253-269.

2. *Formation of singularities for viscosity solutions of Hamilton-Jacobi equations in one space variable,* Comm. P.D.E **18** (1993), 747 - 770.

3. *Formation of singularities for viscosity solutions of Hamilton-Jacobi equations in higher dimensions,* Comm. P.D.E **18** (1993), 1085 - 1108.

4. *Generalized motion by mean curvature with Neumann conditions and the Allen-Cahn model for phase transitions* (with M. Katsoulakis and F. Reitich), J. Geometric Analysis **5** (1995) no 2., 255-279.

5. *Semi-local classification of geometric singularities for Hamilton-Jacobi equations,* (with S. Izumiya) J. Diff. Equations **118** (1995) 116-193.

6. *Geometric singularities for solutions of single conservation laws* (with S. Izumiya) Arch. Rat. Mech. Anal. **139** (1997), no. 3, 255-290. cv

7. *Classification of singularities for viscosity solutions of Hamilton - Jacobi equations* (with S. Izumiya) Banach Center Publ., **33** (1996), Polish Acad. Sci.

8. *Realization theorems for geometric singularities for Hamilton - Jacobi equations* (with S. Izumiya) Comm. Anal. Geom. **5** (1997), no. 3, 255-290.

9. *Bifurcations of shock waves forcv viscosity solutions of Hamilton-Jacobi equations of one space variable.*, (with S. Izumiya) Bull. Sci. Math, **121** (1997), 619-667.

10. *Convergence and error estimates for relaxation schemes for multidimensional conservation laws* (with M. Katsoulakis and Ch. Makridakis), Comm. PDES. **24** (1999), no. 3-4, 395–424.

11. *Finite volume schemes for Hamilton - Jacobi equations* (with Ch. Makridakis and P.E. Souganidis), Num. Math. **83** (1999) 3, 427-442

12. *Computation of high frequency fields near caustics* (with Th. Katsaounis and G.N. Makrakis) Math. Models Methods Appl. Sci., Vol. **11** (2001) no. 2, 199-228.

13. *Multivalued Solutions to the Eikonal Equation in Stratified Media* (with S. Izumiya and G.N. Makrakis) Quart. Appl. Math. **59** (2001), no. 2, 365–390.

14. *Geometrical optics and viscosity solutions* (with A.-P. Blanc and G.N. Makrakis), in *Numerical Methods for Viscosity Solutions*, M. Falcone, Ch. Makridakis (eds), Series on Advances in Mathematics for Applied Sciences - Vol. 59, World Scientific Pub. 2001.

15. *On the system of Hamilton-Jacobi and transport equations arising in geometrical optics* (with B. Ben Moussa), Comm. PDES, **28** (2003), 1085–1111.

16. *A Hamilton-Jacobi-Belmann approach to the control of trapping time of a soliton in an external potential* (with Th. Yannacopoulos and M. Plexousakis), Quart. Appl. Math. **63** (2005), no. 2, 309–324.

17. *Noise regularization and computations for the 1-dimensional stochastic Allen-Cahn problem* (with M. Katsoulakis, O. Lakkis) Interfaces Free Bound. **9** (2007), no. 1, 1–30.

18. *Feedback Nash equilibria for non-linear differential games in pollution control* (with M. Plexousakis, A. Xepapadeas, A. de Zeeuw and K-G. Mäler) Journal of Economic Dynamics and Control, **32**, (2008), no. 4, 1312-1331.

19. *Fully-discrete finite element approximations for a fourth-order linear stochastic parabolic equation with additive space-time white noise* (with G. Zouraris), ESAIM: Math. Model. Numer. Anal. **44** (2010) 289-322.

20. *Asymptotics for a generalized Cahn-Hilliard equation with forcing terms* (with D.C. Antonopoulou and G. D. Karali), Discrete and Cont. Dyn. Syst. - Series A, **30** (2011), no. 4 p. 1035.

21. *The Value Function of the Shallow Lake Problem as a Viscosity Solution of a HJB Equation* (with Ch. Zohios) Quart. Appl. Math., **70** (2012), 625-657.

22. *On the Optimal Taxation of Common-Pool Resources* (with M. Plexousakis, A. Xepapadeas, A. de Zeeuw), Journal of Economic Dynamics and Control, **35** (2011) 1868 - 1879.

23. *Geometrical methods for level set based abdominal aortic aneurysm lumen, thrombus and outer wall 2D image segmentation* (with Ch. Zohios and I. Papaharilaou), Computer Methods and Programs In Biomedicine, **107**(2):202-17 (2012).

24. *Finite element approximations for a linear fourth-order parabolic SPDE in 2D and 3D space dimensions with additive space-time white noise* (with G. Zouraris), Appl. Numer. Math., 67 (2013), 243-261.

25. *Finite element approximations for a linear Cahn-Hilliard-Cook equation driven by the space derivative of a space-time white noise* (with G. Zouraris), Discrete and Cont. Dyn. Syst. - Series B, Volume 18, Issue 7, Pages : 1845 - 1872, 2013.

26. *The Deterministic and Stochastic Shallow Lake Problem* (with M. Loulakis and P.E. Souganidis), in: Friz P., König W., Mukherjee C., Olla S. (eds) Probability and Analysis in Interacting Physical Systems, in honor of S.R.S. Varadhan 75th birthday, Springer 2019, 49-74.

Publications in Conference Proceedings

1. *Detection of lumen, thrombus and outer wall boundaries of an abdominal aortic aneurysm from 2D medical images using level set methods* (with Y. Papaharilaou, C. Zohios) ASME 2008 Summer Bioengineering Conference, June 25-29, Marriott Resort, Marco Island, Florida, USA.

2. *Geometrical methods for making the level set framework suitable for abdominal aortic aneurysm lumen, thrombus and outer wall 2D image segmentation set methods* (with Y. Papaharilaou, C. Zohios) International Conference on Modern Mathematical Methods in Science and Technology (M3ST '09) Poros Island, Greece, Poros Image Hotel, September 3-5, 2009

3. *On the Performance of the WRF Numerical Model over Complex Terrain on a High Performance Computing Cluster* (with N. Christakis, T. Katsaounis, and M. Plexousakis) (2014, August). In High Performance Computing and Communications, 2014 IEEE 6th Intl Symp. on Cyberspace Safety and Security, 2014 IEEE 11th Intl. Conf. on Embedded Software and Systems (HPCC, CSS, ICESS), 2014 IEEE Intl. Conf. Proceedings, pp. 298-303, IEEE.

4. *WRF input parameter updates based on recent and longterm satellite observations*, (with N. Benas, N. Chrysoulakis, N. Christakis, M. Plexousakis) in: Kanakidou, nM., Mihalopoulos, N. and Nastos, P. (Eds): e-book proceedings 12th International Conference of Meteorology, Climatology and Physics of the Atmosphere (COMECAP 2014), pp. 127-131.

INVITED TALKS - VISITS

1. Department of Mathematics, University of Sussex, England, November 2010
2. Hausdorff Research Institute for Mathematics HIM, University of Bonn, from February to April 2008
3. Multiscale Analysis and Computations in Stochastic Differential Equations and Modelling, University of Sussex, February 2007.
4. Numerical Methods for Viscosity Solutions and Applications, Universitity of Rome, La Sapienza, September 2004.
5. Singularities in nonlinear problems, Bratsislava, May 2003.
6. A-HYKE Conference, Vienna (session organizer & speaker), February 2003.
7. Panhellenic Conference in Applied Mathematics in honour of C. Dafermos, June 2001, Heraklion.
8. Conference on Viscosity Solutions and Applications, Bressanone-Brixen, Italy, July 2000.
9. Workshop on Numerical Methods for Viscosity Solutions and Applications, July 1999, Heraklion.
10. Conference in the Memory of S.N. Kruzhkov, Besançon, France, June 1999.
11. First Euro-conference 1997, Hyperbolic Conservation Laws, February 1997, Lyon, France
12. CIME session on Viscosity Solutions and Applications, Montecatini Terme, June 1995
13. Stefan Banach Int. Mathematical Center, Warsaw, Poland, April 1995
14. Institut fuer Angewandte Mathematik der Universitaet Bonn, July 1993.
15. Dipartimento di Matematica Universita di Roma Tor Vergata, July 1993.
16. Dept. of Mathematics, Univ. of Wisconsin, Madison Wisconsin, November 1992.
17. Dept. of Mathematics, Michigan State Univ., East Lansing, October 1992.
18. Dept. of Mathematics, Hokkaido University, July 1992.

RESEARCH GRANTS

1. Member of the European Research Network TMR on "Hyperbolic Conservation Laws" (October 1996 - September 2000). Member of the Steering Committee of the Network (October 1996 - April 1998).
2. Local Coordinator of the European Research Network TMR on "Viscosity Solutions and Their Applications" and member of the Steering Committee (April 1998 - April 2002).
3. "Numerical-asymptotic study of high frequency wave fields in layered media with applications in geophysical exploration, Special Account, University of Crete (Scientist in charge), 2000-2001,

4. Member of the European Training Network "HYKE" (2002-2005)

5. Member of the European Training Network "Front and Singularities" (2002 - 2005).

6. Principal Researcher in PYTHAGORAS "Administration of Natural Resources" (2004-2006)

7. "Mathematical Strategies towards hierarchical coarse-grainings of multiscale systems", (coordinator) Marie-Curie International Reintegration Grants No 517911 (2006-2008)

8. PhD supervisor and PI in PENED 2003 (2005-2008), "Clinical, experimental and computational investigation of the evolution of hemodynamics in aneurysms and synthetic vascular grafts of the abdominal aorta and development of advanced visualization tools for clinical management support". In collaboration with the Medical School, Division of Vascular Surgery and the Dept. of Mathematics Univ. of Crete and the Mech. Eng. Dept. NTUA.

9. Principal Researcher in Junior Hausdorff Semester Program "Computational Mathematics" 01.02. - 30.04.2008, Hausdorff Research Institute for Mathematics , Universitaet Bonn

10. Member of Archimedes Center for Modeling, Analysis and Computation (ACMAC), University of Crete

11. Team Leader and Principal Researcher in the "Study of extreme weather phenomena at a local scale and prediction of their impact on sectors of civil protection and the economy", Program "SYNERGASIA", Greek Secretariat of Research and Technology, 2010-2013.

12. Team leader and Principal Researcher of the University of Crete Team in "Optimal Managment of Dynamic Systems of the Economy and the Environment", Research Program "THALES", Section: Social, Administrative and Economical sciences, 2012-2014. Ministry of Education, Lifelong Learning and Religious Affairs

13. Principal Researcher of the University of Crete Team in "Analysis, Modeling and Simulations of Complex and Stochastics Systems", Research Program "THALES", Section: Mathematics, Physics, Chemistry, 2012-2014. Ministry of Education, Lifelong Learning and Religious Affairs

14. Scientific Coordinator of the of the University Program "Acquisition of Academic Teaching Experience for Young Doctoral Scientists at the University of Crete", 2016-17, 2017-18, 2018-19, 2019-20, Ministry of Development and Investments

15. Organizer of the Summer School of Crete for elementary and high school students: Mathematical Escapes 2018 and Mathematical Escapes 2019. Funded by the Region of Crete.

ORGANIZED WORKSHOPS

1. Congress on Free Boundary Problems-97 (Herakleion, June 8-14, 1997) (Local organizer)

2. TMR Workshop (Herakleion, April 1-4, 1998) Hyperbolic aspects of moment closure problems (Organizer)

3. TMR Summer program (Herakleion, June 15 - July 18, 1998) Theoretical and numerical aspects of hyperbolic systems (Local Organizer)

4. TMR Summer program (Herakleion, July 12 - August 8, 1998) Viscosity solutions applied to phase transitions and front propagation (Organizer)

5. Workshop on "Turbulence, Mixing and Diffusion in Environmental Sciences", Herakleion, March 22-24, 1999 (Local organizer)

6. Conference on "Viscosity Solutions and their Applications", Mallorca, Spain, March 8-10, 2001 (Scientific Committee)

7. Panhellenic Conference in Applied Mathematics in honour of C. Dafermos, June 2001, Heraklion

8. Mathematical and Computational Methods for Accelerated Molecular, Stochastic and Hybrid Simulation Workshop, FORTH, Heraklion, 25-27 June 2007

9. Efficiency in and Modeling with Computational Stochastic Partial Differential Equations, Hausdorff Research Institute for Mathematics HIM, Bonn, April 3 - 5, 2008

10. The ACMAC workshop on Stochastic Partial Differential Equations, June 13 - 17, 2011, Heraklion, Greece

11. Mini symposium on Modelling and Computations in Atmospheric Sciences, September 19, 2013 in International Conference on Applied Mathematics Heraklion, Crete, Greece, September 16-20, 2013.

12. Workshop on Stochastics and Finance, July 18-19, 2017, Department of Mathematics and Applied Mathematics, University of Crete, Heraklion, Crete.

13. Workshop "SDEs/SPDEs: Theory, Numerics and their interplay with Data Science" June 26-30, 2019 Department of Mathematics and Applied Mathematics, University of Crete, Panepistimioupolis, Heraklion, Crete, Greece

COURSES TAUGHT

Undergraduate: Operations Research, Theory of Probability, Stochastic Processes, Mathematical Theory of Fluid Mechanics, Mathematical Modeling in the Environment-Atmospheric Pollution, Advanced Calculus II & III, Introduction to Real Analysis, Functions of Several Variables, Linear Algebra, Introduction to Classical Analysis, Approximation Theory, Mathematical Models in Classical Physics, Dynamic Meteorology, Theory of Optimal Control, Differential Equations, Partial Differential Equations.

Graduate: Partial Differential Equations, Theory of Weak Solutions for PDEs, Methods in Applied Mathematics, Mathematical Modeling of Groundwater Pollution (Dept. of Chemistry), Theory of Probability, Theory of Stochastic Processes, Deterministic and Stochastic Optimal Control, Elements of Mathematical Modeling (Graduate Program Optics & Vision), Dynamical Systems.

Post-doctoral Fellows

L. Gosse, A.-P. Blanc, S. Bernard, B. Ben Moussa, O. Lakkis

Supervision of MSc Thesis and PhD students

MSc: J. Vardas. Cr. Zohios, M. Nipyraki, E. Houstoulakis, St. Eleftherakis

PhD: Ch. Zohios

DEPARTMENT AND UNIVERSITY SERVICES

1. Chairman of the Department of Mathematics and Applied Mathematics, University of Crete, November 2015 - August 2019
2. Deputy Chairman of the Department of Mathematics, University of Crete, September 2011 - August 2013
3. Participation in various departmental committees
4. Member of the University Technical Council, December 2004-July 2009
5. Head of the Herakleion University Campus Public Works Final Inspection and Acceptance Committee (2006)