

## Curriculum Vitae

### I.1. PERSONAL DETAILS

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Name Theodoros  
Surname Karakasidis  
Current Position Professor of Applied Physics  
Work Address Department of Physics, School of Sciences  
University of Thessaly, Lamia, Greece (<https://www.phys.uth.gr/en/>)  
Director of Condensed Matter Physics Laboratory,  
<https://comphylab.phys.uth.gr/>  
Director of the Graduate Program "Applied Physics", Department of  
Physics University of Thessaly  
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[Google Scholar Profile](#)

[Scopus Profile](#)

[ResearchGate Profile](#)

[ORCID profile](#)

[Web of Science](#)

### I.2. EDUCATION

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- *BSc in Physics*, Aristotle University of Thessaloniki, Greece (1989) (GPA 9.51/10).
- *MSc in Materials Science*, University Pierre et Marie Curie (Paris 6), Paris, France (1991).
- *PhD in Physics*, University Pierre et Marie Curie (Paris 6), Paris, France (1995).
- *Master in Education*, Greek Open University, Greece (2009).

### I.3. ACADEMIC HONOURS & AWARDS

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- Visiting Researcher at the Laboratoire d'Etude des Transferts en Hydrologie et Environnement, Université Joseph Fourier Grenoble, France (17 June-17 July 2012)
- Visiting Professor, Physics Dept., University of Cyprus, Nicosia (Sep 2011-Dec 2011)
- Postdoctoral grant by the National Scholarship Foundation, Greece (1-Jan-2001 to 31-Dec-2002) "Simulation of liquids using Molecular Dynamics Techniques"
- Onassis Foundation Scholarship for Graduate Studies (1991).
- Highest Grade Point Average, Dept. of Physics, University of Thessaloniki (1989).

- Scholarship for Excellence in Academic Performance, Dept. of Physics, University of Thessaloniki, National Scholarship Foundation, Greece (1985 through 1989).

#### **I.4. RESEARCH INTERESTS**

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- Computational materials science
- Nanomaterials, nanofluidics and nanotechnology
- Parallel computing and computational methods
- System dynamics and non-linear time series computational analysis
- Machine learning, data analytics
- Teaching Science and Technology with the use of ICT
- Scientific Literacy, Physics Education

#### **I.5. TEACHING EXPERIENCE**

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**1997-present** University of Thessaly.

Sep 1997 – Aug 2005	Adjunct Assistant Professor, School of Engineering, University of Thessaly, Volos, Greece
Sep 2005 – Oct 2009	Lecturer of Applied Physics, Department of Civil Engineering, School of Engineering, University of Thessaly, Volos, Greece
Nov 2009 – Feb 2014	Assistant Professor of Applied Physics, Department of Civil Engineering, School of Engineering, University of Thessaly, Volos, Greece
Feb 2014 – Aug 2018	Associate Professor of Applied Physics, Department of Civil Engineering, School of Engineering, University of Thessaly, Volos, Greece
Sept 2018 – Aug 2020	Professor of Applied Physics, Department of Civil Engineering, School of Engineering, University of Thessaly, Volos, Greece
Sept 2020 – present	Professor of Applied Physics, Department of Physics, School of Sciences, University of Thessaly, Lamia, Greece

#### **Undergraduate courses**

##### **DEPARTMENT OF PHYSICS, University of Thessaly, Volos, Greece**

- **Introduction to Contemporary Physics (winter semester)**

As Faculty member (2020)

- **Electromagnetism I (winter semester)**

As Faculty member (2020 -present)

- **General Physics II (spring semester)**

As Faculty member (2021)

- **Electromagnetism II (spring semester)**

As Faculty member (2021-present)

- **Condensed Matter Physics I (spring semester)**

As Faculty member (2022-present)

**DEPARTMENT OF CIVIL ENGINEERING, University of Thessaly, Volos, Greece**

- **Physics I (winter Semester)**

As Adjunct Lecturer (1997 to 2004), As Faculty member (2005 to 2020)

- **Physics II (spring semester)**

As Adjunct Lecturer (1997 to 2004), As Faculty member (2005 to 2020)

- **Numerical Analysis (winter Semester)**

As faculty member (2012-2020)

- **Academic writing**

As faculty member (2015 to present)

**DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING, University of Thessaly, Volos, Greece**

- **Physics I (winter Semester)**

As Adjunct Lecturer (2000)

- **Physics II (spring semester)**

As Adjunct Lecturer (2000)

**DEPARTMENT OF MECHANICAL ENGINEERING, University of Thessaly, Volos, Greece**

- **Electromagnetism-Optics (2000)**

As Adjunct Lecturer (2000)

**DEPARTMENT OF PHYSICS, University of Cyprus, Nicosia, Cyprus**

- **Physics for Chemists**

- **General Physics III (Waves, Electromagnetic waves, optics, modern physics)**

As Visiting Professor (2011)

**GRADUATE COURSES**

**2005-2011** University of Thessaly: Department of Civil Engineering, University of Thessaly, Volos, Greece

- **System Theory and Simulation (spring semester),**

- Applied Mathematics (winter semester)
- Linear Algebra and Applications.

**2010-2016** Common Greek-French Master Hydrohazards between University of Thessaly and University Joseph-Fourier Grenoble

- Teaching at the Risk Course elements of non-linear time-series analysis (In English).

**2017-present** Interdepartmental Interinstitutional Graduate Program “Econophysics – Financial Forecasting”

-Teaching the courses

- “Statistical Physics and Thermodynamic approach to Economy”
- “Seminar course Research Methodology”

**2021-present** Graduate Program “Applied Physics” Department of Physics

-Teaching the courses

- “Computational Materials Science”
- “Advanced data analysis”
- “Research Methodology I and II”

**I.6. DIPLOMA THESIS SUPERVISING (20)**

**I.7. M.SC THESES SUPERVISION (25)**

**I.8. POSTDOC, PH. D. SUPERVISION AND COMMITTEES**

Supervisor of postdoctoral research at the Department of Physics, U.Th. in progress

- Dr. Avraam Harakopoulos on *"Analysis of Natural Systems Dynamics with Methods of Complex Time Series Networks and Machine Learning"*.
- Dr. Evangelos Karvelas on *"Magnetic nanoparticles for the purification of water from heavy metals: Study with advanced methods of computational simulation"*.

Ongoing PhD theses

- Papastamatiou K. “Symbolic regression and machine learning with applications in Materials Science and Dynamical Systems”, Department of Physics, University of Thessaly.
- Stergiou K. “Analysis and forecasting of energy resources availability and pricing with advanced time series analysis and machine learning methods” Dept. of Civil Engineering, University of Thessaly

#### Supervisor of PhDs successfully defended

- Tsoutsoumanos E. “Study of the phenomenological models of induced luminosity in the micro-scale and nanoscale dimensions through simulations in a programming environment”, Department of Physics, University of Thessaly, September 2024
- Liosis C. «Modeling of water purification via chemical reactions and electromagnetic driving of particles”. Dept. of Civil Engineering, University of Thessaly, December 2023
- Myrovali G., “C Methodological framework for the recognition and identification of the Dynamics of Road Urban Traffic», Dept. of Civil Engineering, University of Thessaly, July 2020
- Karvelas E. «Magnetic driving of particles in Newtonian and non-Newtonian fluids”, *successfully defended, February 2019.*
- Fragkou A. «Detection and characterization of observations correlations of Dynamic Systems with advanced time series analysis methods», *successfully defended, January 2017.*
- Charakopoulos A. «Analysis and identification of spatiotemporal phenomena with the use of advanced Time series analysis methods” *successfully defended, July 2015.*

#### Member of the Consulting Committee of Phd candidates that have been successfully defended

- Tantos C., Dept. of Mechanical Engineering, University of Thessaly, Greece (2016) «Effect of rotational and vibrational degrees of freedom in polyatomic gas heat transfer, flow and adsorption processes far from equilibrium»
- Lemonakis P., Dept. of Civil Engineering, University of Thessaly, Greece (2012) «Contributing to the investigation of motorcycle drivers' behavior in curved road sections»
- Ioannou A., Dept. of Civil Engineering, University of Thessaly, Greece (2022) Thesis Title: «Methodologies for modelling the water-energy-food nexus and other environmental systems for resilience and sustainability»

- Leousidis A., Dept. of Civil Engineering, University of Thessaly, Greece (2022), Thesis Title: «Experimental and computational field determination of fluid flow velocities (water) in an open pipeline, due to temperature changes».

Member of the Consulting Committee of ongoing Phd candidates

- Chatzoglou E., Scholarship Program DEKA. Laboratory of Hydrodynamics and Environmental Engineering, Department of Civil Engineering, University of Thessaly PhD Thesis Title: "Smoothed Particle Hydrodynamics (SPH) for free-surface flows."
- Ntinopoulos H., Department of Economics, University of Thessaly, PhD Thesis title, "Entropy in Financial Statements"
- Tzinava M., Dept Department of Computer Science and Biomedical Informatics, University of Thessaly" Computational methods for simulation, optimization and intelligent quality control of production processes (from 2020)
- Soulikias A. Investigation of the geometric, dimensional and spatio-temporal parameters and the characteristics of the observer in the mathematical expression of the Fundamental Natural Laws, Dept. of Physics, University of Thessaly
- Girgolas A. "Study and Forecast of Economic Indicators with the Use of Non-Linear Dynamics", Department of Physics, Aristotle University of Thessaloniki, Greece
- Kalogeras D., "Political and Social Culture Strategies in the Teaching of Mathematics", Department of Electrical and Computer Engineering, University of Peloponnese, Greece.
- Papadopoulos G. "Multidimensional data analysis, Complex networks and international economic systems", Department of Physics, Democritus University of Thrace, Greece
- Papavasiliou Z. «Study of spatiotemporal evolution of vulnerability of water supply networks through analysis of time series failures and use of Geographic Information Systems» Department of Civil Engineering, University of Thessaly, Greece.
- Pantazi V. Stability of Steel Structures Thesis Title: Buckling of Flat Straight and Curved Steel Structures based on Catastrophe Theory, Department of Civil Engineering, University of Thessaly, Greece.

Participation in three-member examination committees of Diploma Thesis of undergraduate students of the Department of Civil Engineering of the University of Thessaly (>40)

Participation in three-member examination committees of Diploma Thesis of postgraduate graduate students of the University of Thessaly (>30)

## **I.9. PARTICIPATION IN PHD EXAMINATION COMMITTEES**

- Kasiteropoulou D. «Methods of Mesoscopic and Macroscopic Simulation of Fluid Motion” *successfully defended, 2012*. Dept. of Civil Engineering, University of Thessaly
- Sofos F. «Numerical Simulation and experimental study of flows in micro and nano-channels” *successfully defended, 2012*. Dept. of Civil Engineering, University of Thessaly
- Pantazis S. «Simulation of transport phenomena in conditions far from thermodynamic equilibrium via kinetic theory with applications in vacuum technology and MEMS” (2011) Dept. of Mechanical Engineering, University of Thessaly.
- Galanis A. «Contributing to the development of a methodology for monitoring and evaluation of road safety and pedestrian mobility in the urban environment» (2011) Dept. of Civil Engineering, University of Thessaly.
- Lemonakis P.. Dept. of Civil Engineering, University of Thessaly, « Contributing to the investigation of motorcycle drivers' behavior in curved road sections » (2012)
- Lycharopoulos I. (2014) «Computational solution of kinetic equation in time varying transport phenomena far from equilibrium» Dept. of Mechanical Engineering, University of Thessaly
- Tantos C. «Effect of rotational and vibrational degrees of freedom in polyatomic gas heat transfer, flow and adsorption processes far from equilibrium” Dept. of Mechanical Engineering, University of Thessaly (2016)
- Gkana A. «Complex Population Dynamics and Economic Repercussions: Predator-Prey Interactions, Infectious Disease Transmission and Solar Magnetic Activity» Department of Economics, University of Thessaly (2016)
- Dimitriadis P., “Hurst-Kolmogorov dynamics in hydroclimatic processes and in the microscale of turbulence”, School of Civil Engineering, National Technical University of Athens (2017)
- Kaloudis K. “Bayesian methods and estimation of nonlinear dynamical system”, Dept. of Mathematics, University of the Aegean, Greece (2019)
- Razis D., “Nonlinear waves in the granular matter flow”, Department of Mathematics, University of Patras (2020)
- Patelis M. “The management of water supply networks along the axes of quantity, quality and energy” Department of Civil Engineering, University of Thessaly (2023)
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### Reviewer for the PhD thesis

- Iacobello G. “Spatio-temporal analysis of wall-bounded turbulence. A multidisciplinary perspective via complex networks “, Doctoral School of Politecnico di Torino, Italy (also served as external reviewer) (2020)

## **I.10. RESEARCH POSITIONS AND EXPERIENCE**

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**Horizon MSCA Program Project PROMATAI** Development and testing of innovative solutions for the processing of hybrid materials and nanomaterials using artificial intelligence algorithms, 2024-2026, Senior Researcher

**March 2023- present** National Program for Controlled Thermonuclear Fusion (EPETH/UTH – DEMOKRITOS) Senior Researcher, financed by the EUROFUSION network

**July 2023-Dec 2024** Principal Investigator "Research actions in the digital design of new materials for sustainable development", Research Committee, University of Thessaly, Greece

**3-Oct-2023 to 2 Oct-2027: Member of the Managing Committee of the Cost Action CA22123** "European Materials Acceleration Center for Energy"

**03/2022-03/2025** Senior Researcher I the project "Multiscale modelling of environmental and free surface flows with particle-based methods (MOVEFREE)", no. 4584, U.Th. - Brown University, USA, Hellenic Foundation for Research and Innovation

**10/2022-12/2022** Researcher in the project Horizon ARSINOE Climate-resilient regions through systemic solutions and innovations. Action. Analysis of climate data using complex networks

**2021-2023 Senior Researcher, Coordinator of Work Package** "Development of physical models for advanced materials and validation through experiments and simulation in a high performance computer environment", ParICT\_CENG, run by the School of Sciences of University of Thessaly and financed by the Region of Central Greece. (Total budget 1.260.000€, work package budget 145.000 €)

•**2020-2021 Principal Investigator**, Project "Magnetic driving of nanoparticles in human arteries' networks". Funded by the Ministry of Education in support of young researchers. Responsible for one post-doc and one doctoral student. (Budget 65.000 €)

•**March-14 to Sep 15** Senior Researcher, "ARISTEIA Project-Fatigue of Materials Used in Vascular Surgery", University of Thessaly. (Budget 246.000 €).

- Modeling of flows at nano and microscale with applications in blood flow.

•**1-Sep-11 to 31-Dec-11** Senior Researcher, "Atomistic simulation of peptides", University of Cyprus.

- Perform analysis of biological molecules from simulations results using CHARMM and NAMD codes and in house developed programs.
- More precisely we have initiated a research collaboration, which aims to elucidate by atomistic MD simulations the structure and interactions of complexes between peptides A $\beta$  and IAPP, respectively, implicated in the development of Alzheimer's disease and type-2 diabetes.



• **1-Jul-07 to 31-Dec-08** Principal Investigator “Atomistic modeling of oxide interfaces”, Funding University of Thessaly, Research Committee.

- Developed molecular simulations for Si/NiO interfaces, running on a local cluster of 16nodes.

• **1-Mar-04 to 31-Dec-08** senior researcher in the program «Analysis and modeling of chaotic behavior in hydraulic systems: from the microscale to macroscale”, funded by the Greek Secretariat of Research and Technology.

(Budget 80.000 Euros)

- Participation in the writing and realization of the scientific proposal.
- Writing of technical and reports as well progress and financial reports of the project.
- Preparation of results and writing of scientific papers for international journals and conferences.

• **1-Nov-05 to 31-Aug-08** Senior researcher in the program “Numerical modeling and experimental study of flows in micro and nano-channels” funded by the Greek Ministry of Development, Greek Secretariat of Research and Technology.

(Budget 120.000 Euros)

- Participation in the writing and realization of the scientific proposal.
- Preparation of technical and financial reports as well as scientific papers for international journals and conferences.
- Co-Direction of two PhD students.

• **1-Jul-08 to 31-Aug-08** Senior Researcher in the Project of the Reform of the Undergraduate Curriculum of the Department of Civil Engineering of the University of Thessaly, Volos, Greece.

- Investigation of the parallel use of simulations and experiments in the teaching of physical sciences.

• **1-Jan-02 to 31-Dec-02** School of Engineering, Hydrodynamics Laboratory. Postdoctoral Research grant by the National Scholarship Foundation, Greece. “Simulation of liquids using Molecular Dynamics Technique”.

- Writing and materializing the scientific proposal as well as scientific papers for international journals and conferences.
- Preparation of Technical and administrative/financial reports.

• **1-May-99 to 31-Dec-02** Participation in the European Program COST-F2 «Electrochemical Sensors for flow measurements”.

- Represented the department of Civil Engineering of University of Thessaly in Steering Committee meetings as well as participated in visits for investigation of possible collaborations with experimental teams in France.

•**1-Jul-00 to 30-Jun-01** Senior Researcher in the research project “Development of a parallel processing environment and testing of parallel algorithms”, funded by the Research Committee of University of Thessaly.

Nature of Duties:

- Participation in the writing and realization of the scientific proposal.
- Writing of administrative progress reports as well as technical reports.
- Production of scientific results and preparation of scientific papers for international journals and conferences.
- Design and build a cluster of PCs running Linux and MPI.
- Adapt molecular dynamics code for parallel processing.
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•**1-Jun-92 to 31-Oct-95** Laboratoire de Solides Irradies, Ecole Polytechnique, France, Grain Boundaries, Researcher.

- Molecular Dynamics simulations on vector and parallel machines (CRAY and IBM Risk clusters) using in house and personally developed Fortran Codes.

•**1-Apr-96 to 8-Apr-97** Military Service (obligatory in Greece).

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•**1-Apr-90 to 30-May-92** Section des Recherches de Metallurgie Physique, Nuclear Research Center of Saclay, France.

- Worked on numerical simulation of grain boundaries in metals, dynamical properties of Calcium Fluoride and diffusion properties of oxides.
- Simulations performed on vector and parallel machines of IDRIS (CRAY and IBM Risk clusters) using in-house and personally developed Fortran Codes.

•**30-Sep-88 to 30-Sep-89** Division of Solid State, Physics Department, University of Thessaloniki, Diploma Thesis “Random Walks on perfect and disordered lattices”. Part of the research program “Dynamics of diffusion in disordered solids” funded by VW-Stiftung.

- Development of Monte Carlo simulations in Fortran to study percolation problems.

### **I.11. OTHER PROFESSIONAL EXPERIENCE**

- **1-7-97 to 30-6-1998 and 1-12-98 to 5-9-2001** SHM LTD Electronic systems, sector of quality control of the electronic light signalling systems produced by the company at road junctions
- **27-7-02 to 31-8-05** Head of the Office of Studies and Research Assurance, Department of Mechanical Engineering, School of Engineering, University of Thessaly, Greece.
- **1-9-03 to 31-8-04** Participation in the project of Reform of the Undergraduate Curriculum of the Department of Mechanical Engineering of the University of Thessaly, Greece.
- **1-12-02 to 30-3-03** Participation in the project "Organization of an international scientific conference (Protection and Restoration of the Environment VI).
- **1-1-02 to 31-8-03** Participation in the EPEAEK II project "Reform of the Postgraduate Curricula of the Department of Mechanical Engineering of the University of Thessaly, Greece.
- **1-5-98 to 31-8-01** Project Manager of the Project of establishment of the Postgraduate Program of the Department of Mechanical Engineering of the University of Thessaly, Greece.
- **1-5-98 to 30-6-00** Project Manager of the Project "Upgrading the Undergraduate Program of Studies" of the Department of Mechanical Engineering of the University of Thessaly, Greece.
- **1-3-98 to 30-4-98** Participation in the project "Development of Work Packages of the Innovation Project".

### **I.12. TRAINING PROGRAMS**

«Digital skills for remote work» (7/2022 – 12/2023), Greece 2.0, National recovery and Resilience Plan», Center for Vocational Training, University of Thessaly, Greece	Principal Investigator
«Modern computing environments and applications» (7/2022 – 12/2023), Greece 2.0, National recovery and Resilience Plan», Center for Vocational Training, University of Thessaly, Greece	Deputy Principal Investigator

### **I.13. ADMINISTRATIVE EXPERIENCE**

- Department Chairman, Department of Physics, University of Thessaly, Greece (Sep 2022 - present)
- Deputy Department Chairman, Department of Physics, University of Thessaly, Greece (Nov 2019- Aug 2022)
- Deputy Chairman of the Department of Civil Engineering, School of Engineering, University of Thessaly Volos, Greece (academic years 2016-17, 2017-18)
- Coordinator of the Curriculum Committee of the Department of Civil Engineering, School of Engineering, University of Thessaly Volos, Greece (academic years 2016-17, 2017-18)
- Coordinator of the Committee for Doctoral Studies, Department of Civil Engineering, School of Engineering, University of Thessaly Volos, Greece (2018-19)
- Representative of the Department of Physics in the Research Committee of the University of Thessaly (2020-2024)
- Representative of the Department of Physics in the Senate of the University of Thessaly
- Member of the Central Committee for Quality Assurance of the University of Thessaly (June 2018-present)
- Representative of the School of Engineering in the Board of the School of Continuous and Professional Learning of the University of Thessaly (2018-2020)
- Representative of the School of Sciences (Deputy Member) in the Board of the School of Continuous and Professional Learning of the University of Thessaly (2020-present)
- Director of the Joint Postgraduate Program “Econophysics-Financial Forecasting” co-organized by the Department of Civil Engineering and the Department of Economics of the University of Thessaly and The Department of Physics of the International University of Greece (2017-2020)
- Director of the Postgraduate Program “Applied Physics” organized by the Department of Physics of the University of Thessaly (2021 –present)
- Lab Director, Condensed Matter Physics Laboratory Department of Physics, University of Thessaly (2021-present).
- Responsible of the Quality Assurance Office for Education and Research, Department of Mechanical Engineering of the University of Thessaly, Volos, Greece. (1-Jul-02 to 01-Jul-05)

- Project Manager in a Project co financed by EU and The Greek Ministry of Education (Operational program "Education", co-financed by the European Social Fund (ESF) and the European Regional Development Fund (ERDF) and national resources) concerning the realization of the Graduate Program of the Department of Mechanical Engineering of the University of Thessaly, Volos, Greece (Budget 500.000 Euro) (1-May-1998 to 31-Aug-2001)
- Project Manager in a Project co financed by EU and The Greek Ministry of Education (Operational program "Education", co-financed by the European Social Fund (ESF) and the European Regional Development Fund (ERDF) and national resources) concerning the realization of the Reform of the undergraduate Program of the Department of Mechanical Engineering of the University of Thessaly, Volos, Greece (Budget 250.000 Euro) (1-May-1998 to 30-Jun-2000)

#### **I.14. EXPERIENCE IN QUALITY ISSUES IN HIGHER EDUCATION**

- Member of The Quality Assurance Unit of the University of Thessaly (2017 to present)
  - Participation in meetings of the body related to the Internal Quality Assurance System.
  - Participation in the formulation of the regulations (indicatively MSc, PhD, bullying, etc.).
  - Participation as representative of The Quality Assurance Unit of the University of Thessaly in Department Accreditations of University of Thessaly
- Coordination of the Accreditation Procedure of the Curriculum of Undergraduate Studies of the Department of Physics of the University of Thessaly (as a chairman of the Department and head of the internal quality assurance unit of the Department)
- Head of the Curriculum Committee of the Department of Civil Engineering, University of Thessaly, 2016-2018 ( In this context, coordination of the teams for the preparation of material for the Accrediation of the Undergraduate Program of the Department.
- Head of the Office of Studies and Research Assurance, Department of Mechanical Engineering, School of Engineering, University of Thessaly , Greece (27-7-02 έως 31-8-05)

Participation in the establishment of procedures and systems for the collection and export of indicators related to teaching (Undergraduate and graduate

Programs) and the research and implementation of relevant reports with associates of the office. Indicatively, the studies

- E. Tsironi, Th. Karakasidis, "Identity study of applicants and selected postgraduate students together with satisfaction and employment survey of graduates of the postgraduate program of studies of the Department of Mechanical Engineering of the University of Thessaly for the period 1998 – 2002", Volos 2003 (72 pages)-Office of Studies and Research Assurance Department of Mechanical Engineering UTH
- E. Tsironi, Th. Karakasidis, "Satisfaction and employment survey of graduates of the postgraduate program of studies of the Department of Mechanical Engineering of the University of Thessaly", Volos 2003 (44 pages).

Participation in HQA and HAHEA workshops on Quality issues

### **I.15. INTERNATIONAL COLLABORATIONS**

Erasmus collaboration with University of Strathclyde, UK

Erasmus collaboration with NTNU University, Norway

International Erasmus Collaboration with Nazarbayev University, Kazakhstan

Bilateral visit program with the Interdisciplinary Centre for Advanced Materials Simulation (ICAMS), Ruhr-Universität Bochum, Germany.

### **I.16. ARTICLE REVIEWER FOR INTERNATIONAL JOURNALS**

(representative list)

- Physical Review E
- Physics of Fluids
- MRS Communications
- Scientific Reports
- Computers in Biology and Medicine
- Current Applied Physics
- International Journal for Numerical Methods in Fluids
- International Journal of Emerging Technologies in Learning (iJET)
- International Journal of Heat and Mass Transfer
- Journal of Computational and Applied Mathematics
- Journal of Intelligent and Fuzzy Systems
- Journal of Mathematical Imaging and Vision
- Journal of Physics: Condensed Matter
- Materials Science and Engineering B
- Mechanics of Advanced Materials and Structures
- Modelling and Simulation in Materials Science and Engineering
- Molecular Simulation
- Nanotechnology
- Surface Science
- International Journal of Nanomedicine

### **I.17. GUEST EDITOR OF SPECIAL VOLUMES**

- 1) Guest Editor, Desalination and Water Treatment Journal (Taylor and Francis) Special Issue “Managing water from its source, to the final user (and back to the environment) 2016 Volume 57, Issue 25, 2016
- 2) Guest Editor, Environmental Processes (Springer) (Volume 2, Issue 1 Supplement, November 2015).
- 3) Guest Editor, Fresenius Environmental Bulletin (PSP) Special Issue “Sustainable environmental design, planning, construction and management (under preparation).

- 4) Guest Editor, Computational Materials Science “Advances in Multiscale Materials Modeling” Selected papers from EUROMAT 2017 Conference

#### **I.18. CONFERENCE CHAIRMAN**

- Session Chairman: “Computational Physics II”, International Conference of Computational methods in Sciences and Engineering (ICCMSE 2003) Kastoria, Greece 12-16 September 2003
- Session Chairman: “North American - European and South American Symposium on Science and Technology Education, “Science and Technology Literacy on the 21<sup>th</sup> Century”, May 31 to June 4, 2006, Nicosia, Cyprus
- Chairman in the 1st Fatigue Workshop for Materials Used in Vascular Surgery organized in the frame of the Project FAMAVASU (funded by the program Excellence II), 24-27/2/2015, Volos, Greece.
- Chairman στη 2nd Fatigue Workshop for Materials Used in Vascular Surgery organized in the frame of the Project FAMAVASU (funded by the program Excellence II), 27-4-2015, Thessaloniki, Greece.

#### **I.19. CONFERENCE – SYMPOSIUM ORGANIZING COMMITTEES**

- Member of the Local Organizing Committee of the 18<sup>th</sup> Summer School/Conference "Non Linear Science and Complexity", Volos, 18-30 July 2005
- Member of the scientific committee of the 2<sup>nd</sup> Educational National Conference «Building the School of Tomorrow», Greek Physical Society, Eretria, Evia, 29-31 January 2010
- Organization (with A. Liakopoulos) of the minisymposium “Atomistic and Hybrid Methods in Fluid Mechanics” in the frame of the 10<sup>th</sup> HSTAM International Congress on Mechanics, May 25-27, 2013, Chania, Crete, GREECE
- Member of the organizing committee of the 12th International Conference “Protection and Restoration of the Environment”, Skiathos, Greece, 29 June-3 July 2014



- Member of the Local Organizing Committee of the 8th GRACM International Congress on Computational Mechanics 12th-15th July 2015, University of Thessaly, Volos GREECE
- Member of the Organizing Committee of the 2nd EWaS International Conference: “Efficient & Sustainable Water Systems Management toward Worth Living Development” June 1-4 2016 Chania, Crete, Greece.
- Member of the Local Scientific Committee in the 23<sup>rd</sup> International Congress on Sound and Vibration (ICSV23), 10-14 July 2016, Athens Greece
- Session Chairman in the 23rd International Congress on Sound and Vibration (ICSV23), 10-14 July 2016, Athens Greece
- President of the Organizing Committee of the 24<sup>th</sup> Summer Scholl Conference “Dynamical Systems and Complexity”, Volos 12-21 July 2017
- Co-organization of the symposium “Multiscale Materials Modeling” in the frame of the International Conference EUROMAT2017, Thessaloniki, September 17-22/9/2017
- Program Committee member of EDUCON2017 (IEEE Gobal Engineering Education Conference) 25-28 April 2017, Athens, Greece
- Member of the organizing committee of the 3rd Econophysics International Conference, Volos, 28-30 September 2017
- Programme Committee member International Conference Complex Systems 2018, 23-28 September, Thessaloniki, Greece
- **Invited speaker**
- Workshop Computational Materials Science, organized by the Hellenic Society for the Science and Technology of Condensed Matter under the auspices of the School of Physics of the Aristotle University of Thessaloniki on December 14 & 15,2019 at the Faculty of Sciences.

## **I.20. PROPOSAL EVALUATOR**

- Evaluator for the Greek General Secretariat of Research
- Evaluator for the Hellenic Foundation for Innovation and Research
- Member of the National Committee of Evaluation in the domain of Nanotechnology for bilateral proposals of the Greek General Secretariat of Research.
- Evaluator for King Fahd University of Petroleum & Minerals (KFUPM), Saudi Arabia
- Evaluator for the Czech Science Foundation
- Evaluator for Marie Curie Doctoral Networks, European Commission

## **I.21. DISTINCTIONS OF PAPERS**

### 1) The paper

Georgiou, D.N., Karakasidis, T.E., Nieto, J.J., Torres, A., Use of fuzzy clustering technique and matrices to classify amino acids and its impact to Chou's pseudo amino acid composition  
*Journal of Theoretical Biology*, 257, 17 (2009)

Was among the 5 Top-cited papers that were published in the *Journal of Theoretical Biology* during 2009-2013.

### 2) The paper

T.E. Karakasidis and C.A. Charitidis, "Multiscale modeling in nanomaterials science",  
*Materials Science & Engineering C* 27, 1082 (2007)

was among the 25 Top downloaded papers of the journal

### 3) The paper

"An Optimized Method for 3D Magnetic Navigation of Nanoparticles inside Human Arteries" by

E. Karvelas, C. Liosis, A. Theodorakakos, T. Karakasidis

that was presented in INTERNATIONAL RESEARCH CONFERENCE- ICDDNBEA 2021 : XV.

International Conference on Drug Delivery Nanosystems for Biomedical Engineering Applications has been selected as the best paper.

The PhD candidate Christos Liosis was attributed the Young researcher award.

#### 4) The paper

Athanasios D. Fragkou, **Theodoros E. Karakasidis**, Ioannis E. Sarris, Application of the visual boundary recurrence plots to magnetohydrodynamic turbulence channel flow  
<https://doi.org/10.1063/5.0168876>

Has been selected as a featured paper

## **I.22. COMPUTER SKILLS**

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- Certified trainer for teaching basic ICT skills to adults based on experience and after following a special course on adult learning and course design from the National Organisation for Accreditation of Qualifications & Vocational Guidance (Greece)
- **General skills**
- Very good knowledge of Microsoft office
- Internet and email

### **Teaching Software**

- Blackboard, Webct, E-Class, Banner
- Seminar in the use of Interactive boards

### **Scientific computing related**

- Large experience in development and optimization of FORTRAN programs.
- Experience in C programming
- Experience in python
- Good Knowledge of Parallel Programming using the MPI/MPICH protocol under Linux.
- Very good knowledge of operating systems UNIX, LINUX, Windows.
- Experience in Matlab

## **I.23. LANGUAGES**

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English : Excellent

French : Excellent

German: Basic

Greek: Mother tongue

## **I.24. SOCIETY MEMBERSHIPS**

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- American Physical Society
- European Physical Society
- Materials Research Society
- IEEE Computer Society

- American Nano Society

### **Science popularization**

- 1) In 2017 I organized a team of five undergraduate students (three female student and two male students) of the Department of Civil Engineering of University of Thessaly for participation in the FameLab Competition. One of them (Doxa Psychogiou) managed to be selected among the ten Greek finalists and one as runner-up (Ioanna Skyrianou)
- 2) Science presentations in schools
- 3) I wrote a book for science popularization “Roulis the Science Cat” (2015), the hero being a cat leaving with a science professor and discussing science with other animals.

## **I.25. SCIENTIFIC PUBLICATIONS**

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### **A. THESES**

- A1.** «Molecular Dynamics Simulation of Diffusion and Grain Boundaries in ionic compounds», Ph.D Thesis, University Pierre et Marie Curie (PARIS 6), Paris France, (1995). (in French)
- A2.** «Study of Dynamical Properties of Calcium Fluoride by Computer Simulations», Master Thesis, University Pierre et Marie Curie (PARIS 6), Paris France,, (1991). (in French)
- A3.** «Correlated random walks on perfect and disordered lattices», Diploma Thesis, Department of Physics, Aristotle University of Thessaloniki, Greece (1989).
- A4.** «Investigation of the use of virtual and Remote labs in the distant learning of physical sciences in Higher Education» Master Thesis in Education, Greek Open University, Greece (2009) (in Greek)

### **B. PUBLICATIONS IN INTERNATIONAL PEER REVIEWED JOURNALS**

- B.1) E. Tsoutsoumanos, D. Tzeli, A. Avramopoulos , N. Laskaris, P.G. Konstantinidis, E. Travlou, N. Korakis, N. Lathiotakis, G. Kitis, G.S. Polymeris, **T. Karakasidis**, Thermoluminescence characteristics of BeO doped with Si, Mg, and Cr: Density Functional Theory calculations and One Trap – One Recombination Center model simulations, *Physica B, Condensed Matter*, <https://doi.org/10.1016/j.physb.2024.416700>
- B.2) Sofia Karakasidou, Athanasios Fragkou, Loukas Zachilas and **Theodoros Karakasidis**, Exploring Price Patterns of Vegetables with Recurrence Quantification Analysis, *AppliedMath* **2024**, 4(3), 1012-1046; <https://doi.org/10.3390/appliedmath4030055>
- B.3) Charakopoulos, A., **Karakasidis, T.**, Ziliaskopoulos, K., C. Laspidou. Complex network analysis of climate and landscape satellite data to explore spatio-temporal patterns in urban environment: the case of Athens. *Appl Netw Sci* **9**, 42 (2024). <https://doi.org/10.1007/s41109-024-00652-0>
- B.4) G Vontzos, V Laitos, A Charakopoulos, D Bargiotas, **TE Karakasidis**, Estimating Spatio-Temporal Building Power Consumption Based on Graph Convolution Network Method, *Dynamics* 4 (2), 337-356 (2024), <https://doi.org/10.3390/dynamics4020020>

- B.5) Sofos, F., Rouka, E., Triantafyllia, V., Andreacos E., Gourgoulianis K.I., Karakasidis E. & **Karakasidis T.** Development and validation of a symbolic regression-based machine learning method to predict COVID-19 in-hospital mortality among vaccinated patients. *Health Technol.* (2024). <https://doi.org/10.1007/s12553-024-00886-z>
- B.6) I. Andreadis, AD Fragkou, **TE Karakasidis**, A Serletis, The credit card-augmented Divisia monetary aggregates: an analysis based on recurrence plots and visual boundary recurrence plots, *Financial Innovation* 10 (1), 106, <https://doi.org/10.1186/s40854-024-00611-9>
- B.7) F Sofos, G Sofiadis, E Chatzoglou, A Palasis, **TE Karakasidis**, A. Liakopoulos, From Sparse to Dense Representations in Open Channel Flow Images with Convolutional Neural Networks, *Inventions* 9 (2), 27 (2024) <https://doi.org/10.3390/inventions9020027>
- B.8) D Angelis, F Sofos, **TE Karakasidis**, Reassessing the transport properties of fluids: A symbolic regression approach, *Physical Review E* 109 (1), 015105 (2024), <https://doi.org/10.1103/PhysRevE.109.015105>
- B.9) E. Tsoutsoumanos, **T. Karakasidis**, N. Laskaris, P.G. Konstantinidis, G.S. Polymeris, G. Kitis Simulation study of a nanomaterial interacting with ionizing radiation through OTOR and IMTS models for different particle sizes, *Materials Research Bulletin*, 170, 112566 (2024) <https://doi.org/10.1016/j.materresbull.2023.112566>
- B.10) Athanasios D. Fragkou, **Theodoros E. Karakasidis**, Ioannis E. Sarris, Application of the visual boundary recurrence plots to magnetohydrodynamic turbulence channel flow **featured paper**, *Physics of Fluids* v.35 105108 (2023) <https://doi.org/10.1063/5.0168876>
- B.11) Sofos, F., Dritselis, C., Misdanitis, S., **T. Karakasidis** & D. Valougeorgis, Computation of flow rates in rarefied gas flow through circular tubes via machine learning techniques. *Microfluid Nanofluid* 27, 85 (2023). <https://doi.org/10.1007/s10404-023-02689-6>
- B.12) Andreadis, AD Fragkou, **TE Karakasidis**, A Serletis, Nonlinear dynamics in Divisia monetary aggregates: an application of recurrence quantification analysis, *Financial Innovation* 9 (1), 1-17, 2023, <https://doi.org/10.1186/s40854-022-00419-5>
- B.13) D Angelis, F Sofos, **TE Karakasidis**, Artificial Intelligence in Physical Sciences: Symbolic Regression Trends and Perspectives, *Archives of Computational Methods in Engineering*, 1-21, 2023, <https://doi.org/10.1007/s11831-023-09922-z>

- B.14) EG Karvelas, SN Doulkeridis, **TE Karakasidis**, IE Sarris, Focus: Fluids: Investigation of Inlet Conditions in The Mixing Process of Nanoparticles and Blood in a T-Shaped Microfluidic Reactor with Small Rectangular Cavities, *The Yale Journal of Biology and Medicine* 96 (1), 43, 2023, [10.59249/FUAH2942](https://doi.org/10.59249/FUAH2942)
- B.15) F Sofos, CG Papakonstantinou, M Valasaki, **TE Karakasidis**, Fiber-Reinforced Polymer Confined Concrete: Data-Driven Predictions of Compressive Strength Utilizing Machine Learning Techniques, *Applied Sciences* 13 (1), 567, 2022, <https://doi.org/10.3390/app13010567> S Koutsoumpos, M Chronaki, C Tsonos, **T Karakasidis**, L Guazzelli, On the application of the Wildman-Crippen model to ionic liquids, *Results in Materials* 16, 100350, 2022, <https://doi.org/10.1016/j.rinma.2022.100350> MI Afridi, ZM Chen, **TE Karakasidis**, (2022) M Qasim, Local Non-Similar Solutions for Boundary Layer Flow over a Nonlinear Stretching Surface with Uniform Lateral Mass Flux: Utilization of Third Level of Truncation, *Mathematics* 10 (21), 4159, <https://doi.org/10.3390/math10214159>
- B.18) A Charakopoulos, **T Karakasidis**, (2022) Backward Degree a new index for online and offline change point detection based on complex network analysis, *Physica A: Statistical Mechanics and its Applications* 604, 127929, [DOI: 10.1016/j.physa.2022.127929](https://doi.org/10.1016/j.physa.2022.127929)
- B.19) **TE Karakasidis**, F Sofos, C Tsonos (2022), The Electrical Conductivity of Ionic Liquids: Numerical and Analytical Machine Learning Approaches, *Fluids* 7 (10), 321 <https://doi.org/10.3390/fluids7100321> C Liosis, G Sofiadis, E Karvelas, **T Karakasidis**, I Sarris, (2022) A Tesla Valve as a Micromixer for Fe<sub>3</sub>O<sub>4</sub> Nanoparticles, *Processes* 10 (8), 1648, <https://doi.org/10.3390/pr10081648>
- B.21) AD Fragkou, I Andreadis, **TE Karakasidis**, The Visual Boundary Recurrence Plot: A Closer Look into the Dynamics of Recurrence Plots (2022), *International Journal of Bifurcation and Chaos* 32 (09), 2250131, <https://doi.org/10.1142/S0218127422501310>
- B.22) EG Karvelas, NK Lampropoulos, **TE Karakasidis**, IE Sarris, (2022) Blood flow and diameter effect in the navigation process of magnetic nanocarriers inside the carotid artery, *Computer Methods and Programs in Biomedicine*, 106916 <https://doi.org/10.1016/j.cmpb.2022.106916>
- B.23) F Sofos, A Charakopoulos, K Papastamatiou, **TE Karakasidis** (2022), A combined clustering/symbolic regression framework for fluid property prediction, *Physics of Fluids* <https://doi.org/10.1063/5.0096669>



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- B.35) Sofos, F., **Karakasidis, T.** (2021) “Machine Learning Techniques for Fluid Flows at the Nanoscale”, *Fluids*, **6**(3), 96; <https://doi.org/10.3390/fluids6030096>
- B.36) Lemonakis P., Eliou N., **Karakasidis T.** (2021) “Investigation of speed and trajectory of motorcycle riders at curved road sections of two-lane rural roads under diverse lighting conditions”, *Journal of Safety Research*. **78**, 138-145 <https://doi.org/10.1016/j.jsr.2021.05.009>
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- B.39) Myrovali, G., **Karakasidis, T.**, Morfoulaki, M., Ayfantopoulou, G. (2021) “Representativeness of Taxi GPS-Enabled Travel Time Data Using Gamma Generalized Linear Model”, *International Journal of Decision Support System Technology (IJDSST)*, **13**(3), 36-53. <https://doi:10.4018/IJDSST.2021070103>
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- B.49) Sofos, F., **Karakasidis, T. E.**, & Spetsiotis, D. (2019). "Molecular dynamics simulations of ion separation in nano-channel water flows using an electric field". *Molecular Simulation*, **45**(17), 1395-1402. <https://doi.org/10.1080/08927022.2019.1637520>
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- B.51) E Karvelas, C Liosis, L Benos, **T Karakasidis**, I Sarris,(2019) "Micromixing Efficiency of Particles in Heavy Metal Removal Processes under Various Inlet Conditions", *Water* **11** (6), 1135 <https://doi.org/10.3390/w11061135>
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- B.59) E. Karvelas, N. Lampropoulos, **T. Karakasidis**, I. Sarris, (2017) "A computational tool for the estimation of the optimum gradient magnetic field for the magnetic driving of the spherical particles in the process of cleaning water", *Desalination and Water Treatment*, 99, 27-33 <https://doi.org/10.5004/dwt.2017.21545>
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