

## CURRICULUM VITAE (12/2025)

FILIPPOS D. SOFOS



**e-mail:** [fsofos@uth.gr](mailto:fsofos@uth.gr)

**Date of birth:** 04/04/1976

**Marital status:** Married, 2 children

### Current position

Associate Professor in Condensed Matter Physics with Computational Techniques (from 2021),  
Condensed Matter Physics Laboratory, Department of Physics, School of Science, University of Thessaly, 3<sup>rd</sup> km  
Old Nat. Rd Lamia-Athens, 35100 Lamia, Greece

### Education

- PhD in Engineering, University of Thessaly (GR) – Civil Engineering Department (2009)
- MSc in Digital systems, Democritus University of Thrace (GR)– Electrical and Computer Engineering
- BSc and MSc in Electrical and Computer Engineering, Democritus University of Thrace – Electrical and Computer Engineering (1999)

### Research interests

- Machine Learning, Deep Learning in Condensed Matter Physics and Fluid Mechanics
- Explainable/Transparent Artificial Intelligence
- Fluid transport properties
- Nano/Micro-fluidics
- Multiscale particle simulations (Molecular Dynamics, Smoothed-Particle Hydrodynamics)
- Electric field flows
- CFD methodologies and Computational Hydraulics
- Environmental and biological flows
- Novel materials

### Research projects

- (9/2025- ) Researcher in EU project “READI” (HS4U), HORIZON action
- (7/2023-8/2025) Researcher in EU project “Healthy Ship 4U” (HS4U), HORIZON action
- (3/2022 – 10/2025) co-Principal Investigator in 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
- (12/2021-12/2023) Principal Investigator in project “A computational framework for microscopic calculations and macroscopic predictions with novel machine learning methods” (CAMINOS), Center of Research Innovation and Excellence (C.R.I.E.) – U.Th.
- (11/2023-12/2024) Principal Investigator in project “Research actions for fostering machine learning in education and industry”, Greece 2.0 Action, U.Th.
- (7/2022-12/2024) Principal Investigator in project “Modern computational systems and applications”, Greece 2.0 Action, KEDIVIM U.Th.

- (7/2022-12/2024) co-Principal Investigator in project “Digitals skills in remote working”, Greece 2.0 Action, KEDIVIM U.Th.
- (10/2023 – 10/2027) Participant researcher in action: European Materials Acceleration Center for Energy (EU-MACE) COST CA22123.
- (from 3/2023) Participant researcher in EU project “EUROFUSION”, with NCSR Democritus (beneficiary) and University of Thessaly as national representatives.
- (7/2014-7/2015), post-doc researcher, University of Thessaly, “Fatigue of Materials Used in Vascular Surgery – 3448, action ARISTEIA II
- (02-09/2012), Marie Curie post-doctoral research fellow, University of Limerick (IE) – Stokes Institute, for EU GASMEMS project, “Temperature measurements in 2-D microflows”
- (03-04/2010), Researcher, U.Th. Development of educational MatLab code for Civil Engineering Department.
- (11/2005-10/2008), PhD student, Greek Secretariat of Research and Technology and University of Thessaly, project “Numerical simulation and experimental investigation of flows at the nano- and micro-scale.
- (07/2005-05/2006), Researcher, TEI of Lamia, Development of educational material for distance learning in IT classes.
- (09/2000-03/2001), Researcher, INTPAKOM S.A. – Xanthi research center, Management and development of Hardware - Software of a telecom multiplexer 4XE1.
- (02/2024-2/2025) Principal Investigator for computational time project “Fluid flow upscaling with artificial intelligence techniques (UpFlow)”, (09/2022-1/2024) “Artificial intelligence: fields of application in physical sciences (AI\_PHYSICS)”, (08/2021-08/2022) “Multiscale water desalination assisted by machine learning techniques” (ULTRAS\_ML), GRNET – National Infrastructures for Research and Technology.

### Teaching experience

- (2025-) Associate professor (post- and under-graduate program) Department of Physics, U.Th.
- (2021-2025) Assistant professor (post- and under-graduate program) Department of Physics, U.Th.
- (2010-2020) U.Th. – Civil Eng. Dept. – Adjunct Lecturer
- (2014-2015) University of Western Macedonia – IT & Telecom Eng. Dept. – Adjunct Lecturer
- (2013-2014) Technological Educational Institute (T.E.I.) of Central Greece – Adjunct Lecturer
- (2004-2013) Technological Educational Institute (T.E.I.) of Larisa – Adjunct Lecturer
- (2005-2008) U.Th. – Civil Engineering Department – Doctoral researcher – Teaching assistant
- (2000-2001) Democritus University of Thrace – Electrical and Computer Engineering Dept., MSc student - Teaching assistant

### Thesis supervision

- Supervisor of phd students in the Department of Physics, U.Th.: Maria Peletidou, Christos Stavrogiannis (grant from U.Th.), Apostolos Palasis (grant from HRFI), Dimitrios Aggelis, (grant from EUROFUSION), Chrysostomos Georgakopoulos
- Supervisor of master’s students Dimitrios Aggelis, Loukas Doukas, Chrysostomos Georgakopoulos, Kalliopi Exarhou-Kouveli, Daniel Akabua.

- Member of the advisory board of phd students: Kostantinos Papastamatiou, Vasileios Mantzavinos, Dimitrios Vasileiou.
- Member of PhD dissertation committee: Efstathios Tsoutsoumanos (University of Thessaly, GR, 2024), Stylianos Tsilioukas (University of Thessaly, GR, 2025), Efstathios Chatzoglou (University of Thessaly, GR, 2025), Christos Liosis (University of West Attica, GR, 2024), Alexandros Leousidis (Aristotle University of Thessaloniki, Gr, 2022).

### **Vocational experience**

- (2015-2021) State employee
- (2004) Electrical engineer in industry section
- (2003-2004) Computer programmer (in parallel with military services).
- (2000-2003) INTPAKOM S.A., Xanthi Research Center, Greece – Software/Hardware Engineer

### **Grants**

- Grant from Center of Research Innovation and Excellence (C.R.I.E.) – U.Th, as new staff member, 2022
- Marie Curie grant as experienced researcher, University of Limerick, Stokes Institute, 2012
- Technical Chambers of Greece, grant for university degrees, Democritus University of Thrace, 1999

### **Languages**

- Mother tongue: Greek
- English: Cambridge Proficiency in English degree (C2)
- Spanish: Inicial de Espanol degree (B1)
- Deutsch: (A2)

### **Computer skills**

- Operating systems: MS Windows, Linux/Unix, Mac
- Programming languages: Python, Julia, Fortran, C/C++, VHDL, Tcl, Assembly
- Computer tools: MatLab/Octave, LabView, LAMMPS, MPLAB, Xilinx Design Suite, Altera Design Suite, Protel PCB, AutoCAD

### **Referee - Editorials**

- Member of Editorial Board: The European Physical Journal (EPJ-ST)
- Topical Advisory Panel, Fluids Journal, MDPI.
- Reviewer/Rapporteur for COST Action proposals
- Guest Editor for the Special Issue “Nanofluidics: Computational Methods and Applications” Frontiers in Nanotechnology Journal, 2022-23.
- Guest Editor for the Special Issue “Machine Learning and Artificial Intelligence in Fluid Mechanics”, Fluids Journal, MDPI, 2022-23.
- Guest Editor for the Special Issue "Fluid Flows at the Nanoscale", Fluids Journal, MDPI, 2021.
- Referee in peer-reviewed journals (indicative): Nature Communications, Physics of Fluids (APS), Microfluidics and Nanofluidics (Springer), Heat and Mass Transfer (Springer), Physica A (Elsevier), Desalination (Elsevier), International Journal of Heat and Mass Transfer (Elsevier), Journal of Molecular Liquids (Elsevier), Computational Material Science (Elsevier), Molecular Simulation (Taylor & Francis), Symmetry, Entropy, Fluids, Applied Sciences, Molecules, Polymers (MDPI), Membrane and Water Treatment (Techno-Press), MRS Communications (Cambridge Core)

## Member of Institutions

- Member of Technical Chambers of Greece since 2000.
- Member of HSSTCM, Psi-K, CECAM

## Journal Article recognition - awards

### 1. Best paper award

- F. Sofos, C. Stavrogiannis, K.K. Exarhou-Kouveli, D. Akaboua, G. Charilas, T.E. Karakasidis, Current Trends in Fluid Research in the era of Artificial Intelligence: A Review, *Fluids* 7 (2022) 116.  
*2022 Best paper award*

### 2. Featured papers

- F. Sofos, D. Drikakis, I.W. Kokkinakis, Deep learning architecture for sparse and noisy turbulent flow data, *Physics of Fluids* 36 (3), 035155 (2024)
- F. Sofos, C.G. Papakonstantinou, M. Valasaki, T.E. Karakasidis, Fiber-Reinforced Polymer Confined Concrete: Data-Driven Predictions of Compressive Strength Utilizing Machine Learning Techniques, *Applied Sciences* 2023, 13, 567.
- F. Sofos, C. Stavrogiannis, K.K. Exarhou-Kouveli, D. Akaboua, G. Charilas, T.E. Karakasidis, Current Trends in Fluid Research in the era of Artificial Intelligence: A Review, *Fluids* 7 (2022) 116.

### 3. Editor's pick

- F. Sofos, D. Drikakis, I.W. Kokkinakis, S.M. Spottswood, Convolutional neural networks for compressible turbulent flow reconstruction, *Physics of Fluids* 35 (11): 116120 (2023)
- F. Sofos, T.E. Karakasidis, Machine learning techniques for fluid flows at the nanoscale, *Fluids* 6, (2021) 96.

### 4. Most downloaded - Most viewed article in Fluids for 36 months (2021-24)

- F. Sofos, C. Stavrogiannis, K.K. Exarhou-Kouveli, D. Akaboua, G. Charilas, T.E. Karakasidis, Current Trends in Fluid Research in the era of Artificial Intelligence: A Review, *Fluids* 7 (2022) 116.

### 5. Most downloaded - Most viewed article in Fluids for 12-24 months (2023-24)

- D. Drikakis, F. Sofos, Can Artificial Intelligence Accelerate Fluid Mechanics Research? *Fluids* 2023, 8, 212.
- T.E. Karakasidis, F. Sofos, C. Tsonos, The Electrical Conductivity of Ionic Liquids: Numerical and Analytical Machine Learning Approaches. *Fluids* 2022, 7, 321

### 6. Shown on the first page of the Journal's site

- U.S. Mahabaleshwar, R. Mahesh, F. Sofos, Thermosolutal Marangoni Convection for Hybrid Nanofluid Models: An Analytical Approach. *Physics* 2023, 5, 24-44.

## Journal Publications

1. E.M. Papiia, A. Kondi, D. Nioras, F. Sofos, V. Constantoudis, Data-driven investigation of analytical relationships in moire structured materials, *Computational Materials Science* 261, 114270 (2026)
2. D. Angelis, F. Sofos, S. Misdanitis, C. Dritselis, T.E. Karakasidis, D. Valougeorgis, V. Haak, D. Naujoks, G. Schlisio, S.A. Bozhenkov, V. Perseo and W7-X Team, Prediction of neutral gas pressure in Wendelstein 7-X: Statistical Analysis and Machine Learning, *Physics of Plasmas* (to appear – 2026)

3. F. Sofos, Advancing Fluid Mechanics with Artificial Intelligence and Machine Learning, *Fluids* 10 (11), 297 (2025)
4. A. Palasis, G. Sofiadis, F. Sofos, A. Liakopoulos, Turbulent channel flow: A physics-informed neural network approach with embedded parameter optimization, *Physics of Fluids* 37 (11) (2025)
5. F. Sofos, D. Drikakis, I.W.Kokkinakis, Reconstructing turbulence: A deep learning-enhanced interpolation approach, *Physica D: Nonlinear Phenomena* 483, 134958 (2025)
6. D. Angelis, C. Georgakopoulos, F. Sofos, T.E., Karakasidis, Physically Consistent Self-Diffusion Coefficient Calculation with Molecular Dynamics and Symbolic Regression. *Int. J. Mol. Sci.* 26, 6748 (2025).
7. D. Angelis, F. Sofos, S. Misdanitis, C. Dritselis, T.E. Karakasidis, D. Valougeorgis, V. Haak, D. Naujoks, G. Schlisio, S.A. Bozhenkov, V. Perseo and W7-X Team, Data driven prediction of the neutral gas pressure in the stellarator Wendelstein 7-X, *Plasma Physics and Controlled Fusion* 67, 075004 (2025)
8. F. Sofos, D. Drikakis, A review of deep learning for super-resolution in fluid flows, *Physics of Fluids* 37 (4): 041303 (2025).
9. F. Sofos, D. Drikakis, I.W. Kokkinakis, Advancing super-resolution of turbulent velocity fields: An artificial intelligence approach. *Physics of Fluids* 37 (3): 035109 (2025).
10. F. Sofos, D. Drikakis, I.W. Kokkinakis, Enhancing Indoor Temperature Mapping: High-Resolution Insights through Deep Learning and Computational Fluid Dynamics, *Physics of Fluids* 37, 015206 (2025).
11. F. Sofos, D. Drikakis, I.W. Kokkinakis, Spatiotemporal super-resolution forecasting of high-speed turbulent flows, *Physics of Fluids* 37, 016124 (2025).
12. F. Sofos, D. Drikakis, I.W. Kokkinakis, Comparison of super-resolution deep learning models for flow imaging, *Computers & Fluids* 283, 106396 (2024).
13. G. Sofiadis, A. Liakopoulos, A. Palasis, F. Sofos, Turbulent Micropolar Open-Channel Flow, *Fluids* 9, 202 (2024).
14. F. Sofos, D. Drikakis, I.W. Kokkinakis, Ultra-scaled deep learning temperature reconstruction in turbulent airflow ventilation. *Physics of Fluids* 36 (6), 065158 (2024).
15. F. Sofos, K. Ritos, A. Avramopoulos, Editorial: Nanofluidics: computational methods and applications, *Frontiers in Nanotechnology* 6, 2024, 10.3389/fnano.2024.1431198
16. C. Papakonstantinou, M. Valasaki, F. Sofos, T. Karakasidis, The application of data science and machine learning techniques in predicting the compressive strength of confined concrete. *Technical Annals*, 1(5) (2024).
17. F. Sofos, E. Rouka, V. Triantafyllia, E. Andreacos, K.I. Gourgoulanis, E. Karakasidis, T. Karakasidis, Development and validation of a symbolic regression-based machine learning method to predict COVID-19 in-hospital mortality among vaccinated patients. *Health and Technology* 14, 1217–1228 (2024)
18. F. Sofos, D. Drikakis, I.W. Kokkinakis, Deep learning architecture for sparse and noisy turbulent flow data, *Physics of Fluids* 36 (3), 035155 (2024).
19. F. Sofos, G. Sofiadis, E. Chatzoglou, A. Palasis, T.E. Karakasidis, A. Liakopoulos, From Sparse to Dense Representations in Open Channel Flow Images with Convolutional Neural Networks. *Inventions* 2024, 9, 27.
20. D. Angelis, F. Sofos, T.E. Karakasidis, Reassessing the transport properties of fluids: A symbolic regression approach, *Physical Review E* 109, 015105 (2024).

21. F. Sofos, D. Drikakis, I.W. Kokkinakis, S.M. Spottswood, A deep learning super-resolution model for turbulent image upscaling and its application to shock-wave boundary layer interaction, *Physics of Fluids* 36, 025117 (2024).
22. C. Stavrogiannis, V. Tsioulos, F. Sofos, A hybrid molecular dynamics/machine learning framework to calculate the viscosity and thermal conductivity of Ar, Kr, Xe, O and N, *Applied Research* (2024), e202300127.
23. C. Stavrogiannis, F. Sofos, M. Sagri, D. Vavougiotis, T.E. Karakasidis, Twofold Machine-Learning and Molecular Dynamics: A Computational Framework, *Computers* 13(1):2 (2024).
24. F. Sofos, D. Drikakis, I.W. Kokkinakis, S.M. Spottswood, Convolutional neural networks for compressible turbulent flow reconstruction, *Physics of Fluids* (2023), 35 (11): 116120.
25. F. Sofos, C. Dritselis, S. Misdanitis, T.E. Karakasidis, D. Valougeorgis, Computation of flow rates in rarefied gas flow through circular tubes via machine learning techniques. *Microfluid Nanofluid* 27, 85 (2023).
26. D. Angelis, F. Sofos, K. Papastamatiou, T.E. Karakasidis, Fluid Properties Extraction in Confined Nanochannels with Molecular Dynamics and Symbolic Regression Methods. *Micromachines* 2023, 14, 1446.
27. D. Drikakis, F. Sofos, Can Artificial Intelligence Accelerate Fluid Mechanics Research? *Fluids* 2023, 8, 212.
28. D. Drikakis, F. Sofos, Applications of Machine Learning in Fluid Mechanics. Encyclopedia. Available online: <https://encyclopedia.pub/entry/48397>
29. D. Angelis, F. Sofos, T.E. Karakasidis, Artificial Intelligence in Physical Sciences: Symbolic Regression Trends and Perspectives. *Archives of Computational Methods in Engineering* 30, 3845–3865 (2023).
30. A. Drakou, F. Sofos, T.E. Karakasidis, A. Tsangrassoulis, Adaptive thermal comfort model and active occupant behaviour in a mixed-mode apartment. A synergy to sustainability, *IOP Conf. Ser.: Earth Environ. Sci.* 1196, 2023, 012097.
31. R. Mahesh, A.B. Vishalakshi, U.S. Mahabaleshwar, F. Sofos, Impact of an inclined magnetic field on couple stress fluid flow over a stretching surface with effect of Stefan blowing, radiation and chemical reaction, *Journal of Magnetism and Magnetic Materials*, 2023, 170953.
32. E. Chatzoglou, A. Liakopoulos, F. Sofos, Smoothed Particle Hydrodynamics-Based Study of 3D Confined Microflows. *Fluids* 2023, 8, 137.
33. F. Sofos, C.G. Papakonstantinou, M. Valasaki, T.E. Karakasidis, Fiber-Reinforced Polymer Confined Concrete: Data-Driven Predictions of Compressive Strength Utilizing Machine Learning Techniques, *Applied Sciences* 2023, 13, 567.
34. R. Mahesh, U.S. Mahabaleshwar, F. Sofos, F. Influence of carbon nanotube suspensions on Casson fluid flow over a permeable shrinking membrane: an analytical approach. *Scientific Reports* 13, 3369 (2023).
35. U.S. Mahabaleshwar, R. Mahesh, F. Sofos, Thermosolutal Marangoni Convection for Hybrid Nanofluid Models: An Analytical Approach. *Physics* 2023, 5, 24-44.
36. C. Stavrogiannis, F. Sofos, T.E. Karakasidis, D. Vavougiotis, Investigation of water desalination/purification with molecular dynamics and machine learning techniques, *AIMS Materials Science*, 2022, 9(6): 919-938.
37. U.S. Mahabaleshwar, T. Maranna, F. Sofos, F. Analytical investigation of an incompressible viscous laminar Casson fluid flow past a stretching/shrinking sheet, *Scientific Reports* 12, 18404 (2022).
38. T.E. Karakasidis, F. Sofos, C. Tsonos, The Electrical Conductivity of Ionic Liquids: Numerical and Analytical Machine Learning Approaches. *Fluids* 2022, 7, 321.

39. F. Sofos, A. Charakopoulos, K. Papastamatiou, T.E. Karakasidis, A combined clustering/symbolic regression framework for fluid property prediction, *Physics of Fluids* 34 (2022) 062004.
40. F. Sofos, C. Stavrogiannis, K.K. Exarhou-Kouveli, D. Akaboua, G. Charilas, T.E. Karakasidis, Current Trends in Fluid Research in the era of Artificial Intelligence: A Review, *Fluids* 7 (2022) 116.
41. K. Papastamatiou, F. Sofos, T.E. Karakasidis, Machine learning symbolic equations for diffusion with physics-based descriptions *AIP Advances* 12 (2022) 025004.
42. F. Sofos, T.E. Karakasidis, I.E. Sarris, Effects of channel height, wall wettability, and electric field strength on ion removal from water in nanochannels, *Scientific Reports* 12 (2022) 641.
43. F. Sofos, E. Chatzoglou, and A. Liakopoulos, An assessment of SPH simulations of sudden expansion/contraction 3-D channel flows. *Computational Particle Mechanics* 9 (2022) 101-115.
44. F. Sofos, A Water/Ion Separation Device: Theoretical and Numerical Investigation, *Applied Sciences* 11(2021) 8548.
45. F. Sofos, T.E. Karakasidis, Nanoscale slip length prediction with machine learning tools, *Scientific Reports* (2021) 11, 12520.
46. F. Sofos, T.E. Karakasidis, Machine learning techniques for fluid flows at the nanoscale, *Fluids* 6, (2021) 96.
47. F. Sofos, T.E. Karakasidis, I.E. Sarris, Molecular Dynamics Simulations of Ion Drift in Nanochannel Water Flow, *Nanomaterials* 10 (2020) 2373.
48. F. Sofos, T.E. Karakasidis, D. Spetsiotis, Molecular Dynamics simulations of ion separation in nanochannel water flows using an electric field, *Molecular Simulation* 45 (2019), 1395-1402.
49. F. Sofos, A. Liakopoulos, T.E. Karakasidis, Particle-based modeling and meshless simulation of flows with Smoothed Particle Hydrodynamics, *Global Nest* 21(2019) 513-518.
50. D. Spetsiotis, F. Sofos, T.E. Karakasidis, D. Kasiteropoulou, A. Liakopoulos, Multi-parameter analysis of water flows in nanochannels, *Desalination and Water Treatment* 125 (2018), 8-15.
51. A. Liakopoulos, F. Sofos, T.E. Karakasidis, Darcy-Weisbach friction factor at the nanoscale: From atomistic calculations to continuum models, *Physics of Fluids* 29, 052003 (2017).
52. A. Liakopoulos, F. Sofos, T.E. Karakasidis, Friction factor in nanochannel flows, *Microfluidics & Nanofluidics* 20 (2016) 1-7.
53. F. Sofos, T.E. Karakasidis, A.E. Giannakopoulos, A. Liakopoulos, Molecular dynamics simulation on flows in nano-ribbed and nano-grooved channels, *Heat and Mass Transfer* 52 (2016)153-162.
54. F. Sofos, T.E. Karakasidis, A. Liakopoulos, Fluid structure and system dynamics in nanodevices for water desalination, *Desalination and Water Treatment* 57 (2015), 11561-11571.
55. A.E. Giannakopoulos, F. Sofos, T.E. Karakasidis, A. Liakopoulos, A quasi-continuum multi-scale theory for self-diffusion and fluid ordering in nanochannel flows, *Microfluidics & Nanofluidics* 17 (2014), 1011-1023.
56. F. Sofos, T.E. Karakasidis, and A. Liakopoulos, How wall properties control diffusion in grooved nanochannels: a molecular dynamics study, *Heat and Mass Transfer* 49 (2013) 1081-1088.
57. P. Berillis, C. Simon, E. Mente, F. Sofos, I.T. Karapanagiotidis, A novel image processing method to determine the nutritional condition of lobster, *Micron* 45 (2013) 140-144.
58. F. Sofos, T.E. Karakasidis, A. Liakopoulos, Fluid flow at the nanoscale: how fluid properties deviate from the bulk, *Nanoscience & Nanotechnology Letters* 5 (2013) 1-4.
59. F. Sofos, T.E. Karakasidis, A. Liakopoulos, Parameters affecting slip length at the nanoscale, *Journal of Computational & Theoretical Nanoscience* 10 (2013) 1-3.
60. A.E. Giannakopoulos, F. Sofos, T.E. Karakasidis, A. Liakopoulos, Unified description of size effects of transport properties of liquids flowing in nanochannels, *International Journal of Heat & Mass Transfer* 55 (2012) 5087-5092.

61. F. Sofos, T.E. Karakasidis, and A. Liakopoulos, Surface wettability effects on flow in rough wall nanochannels, *Microfluidics & Nanofluidics* (2012), Volume 12, Numbers 1-4, 25-31.
62. F. Sofos, T.E. Karakasidis, and A. Liakopoulos, Effect of wall roughness on diffusion coefficient and shear viscosity in nanochannels, *International Journal of Heat & Mass Transfer* 53 (2010) 3839-3846.
63. F. Sofos, T.E. Karakasidis, and A. Liakopoulos, Effects of wall roughness on flow in nanochannels, *Physical Review E* 79 (2009) 026305.
64. F. Sofos, T.E. Karakasidis, and A. Liakopoulos, Transport properties of liquid argon in krypton nanochannels: Anisotropy and non-homogeneity introduced by the solid walls, *International Journal of Heat & Mass Transfer* 52 (2009) 735-743.
65. F. Sofos, T.E. Karakasidis, and A. Liakopoulos, Non-Equilibrium Molecular Dynamics investigation of parameters affecting planar nanochannel flows, *Contemporary Engineering Sciences* 2 (2009) 283-298.

### **Educational Journal Publications**

66. M. Sagri, F. Sofos, D. Mouzaki, “Digital Storytelling, comics and new technologies in education: review, research and perspectives”, *The International Education Journal: Comparative Perspectives* 17 (2018) 98-113.
67. M. Sagri, D. Mouzaki, F. Sofos, “Teaching cinema with machinima”, *International Journal of Arts and Technology* 12, 2 (2020) 155-173.
68. M. Sagri, D. Vavougios, F. Sofos, “The Educational Role of Cinema in Physical Sciences”, *IgMin Res.*, 2023, 1(1): 094-097.

### **Book chapters**

- B1 F. Sofos (Editor), *Machine Learning and Artificial Intelligence in Fluid Mechanics*, Special Issue, Fluids, MDPI
- B2 F. Sofos, T.E. Karakasidis, A.E. Giannakopoulos and A. Liakopoulos, “Fluid flows from nanoscale to macroscale: a molecular dynamics based approach”, *Advances in Civil Engineering Research*, ISBN: 978-960-88490-4-4, Volos 2014.
- B3 F. Sofos, T.E. Karakasidis, and A. Liakopoulos, “Fluid transport properties at the nanoscale by molecular dynamics simulations”, *Advances in Civil Engineering Research*, ISBN: 978-960-88490-4-4, Volos 2014.
- B4 F. Sofos, T.E. Karakasidis, and A. Liakopoulos, “*Variation of transport properties along nanochannels: a study by non-equilibrium molecular dynamics*”, *IUTAM Symposium on Advances in Micro- and Nanofluidics*, IUTAM Bookseries 15, Springer Science + Business Media B.V., 2009.
- B5 F. Sofos, I. Andreadis, F. Tsalides, “*A cellular approach on calculating square root according to IEEE 754*”, *Proceedings of the 4<sup>o</sup> Int. Conference on Technology and Automation*, Tziolas, Thessaloniki GR, 2000.

### **Conference publications/presentations**

1. A. Palasis, F. Sofos, A. Liakopoulos, Data- and physics-driven analysis of turbulent channel flows: Insights from DNS and Deep Learning, 1<sup>st</sup> International Symposium on AI and Fluid Mechanics (AIFLUIDs), 27-30 June 2025, Chania, Greece
2. F. Sofos, D. Drikakis, Deep Learning for Flow Imaging and Spatiotemporal forecasting, 1<sup>st</sup> International Symposium on AI and Fluid Mechanics (AIFLUIDs), 27-30 June 2025, Chania, Greece
3. F. Sofos, G. Sofiadis, A. Liakopoulos, Refining Flow Structures with Deep Learning and Super Resolution Methods. SETN '24: Proceedings of the 13th Hellenic Conference on Artificial Intelligence, September 2024, Pireaus, Greece.



4. C. Georgakopoulos, D. Angelis, F. Sofos, T.E. Karakasidis, Symbolic machine learning expressions for fluid properties in nanochannels, XXXVIII Panhellenic Conference on Solid State Physics and Materials Science, 15-18 September 2024, Ioannina, Greece.
5. F. Sofos, T.E. Karakasidis, G. Sofiadis, A. Liakopoulos, Lightweight super resolution architecture for flow reconstruction, XXXV IUPAP Conference on Computational Physics 2024", Thessaloniki, Greece, 7-12 July 2024.
6. F. Sofos, D. Drikakis, I.W. Kokkinakis, Deep Learning of Turbulent Topologies, 1<sup>st</sup> Workshop on Machine Learning for Fluid Dynamics, 6-8 March 2024, Sorbonne University, Paris, France.
7. C. Dritselis, D. Aggelis, F. Sofos, K. Ritos, T. Karakasidis, D. Valougeorgis, Machine learning scattering kernels of neutrals reflected from plasma facing components, 26th PSI conference, Marseille May 2024, FR.
8. F. Sofos, T.E. Karakasidis, Materials properties extraction with interpretable artificial intelligence, EERA-AMPEA/DfE & COST Action EU-MACE joint workshop on Digitalization and Automation Boost Energy Materials Research, Rome 24-25 January 2024, IT.
9. F. Sofos, V. Bartzis, T.E. Karakasidis, I. Sarris, Electric field-driven water desalination across scales, 10th International Conference on Micro-Nanoelectronics, Nanotechnology and MEMS - Micro Nano 2023, 2-5 November 2023, Athens, GR
10. D. Aggelis, F. Sofos, T.E. Karakasidis, Generating analytical mathematical equations for the transport properties of fluids from simulation data through symbolic regression, XXXVII Panhellenic Conference on Solid State Physics and Materials Science, 17-20 September 2023, Thessaloniki, Greece.
11. V. Tsioulos, S. Serifis, K. Bakopoulos, A. Nika, I. Vourgidis, N. Ntinis, C. Stavrogiannis, F. Sofos, A hybrid molecular dynamics/machine learning framework to calculate the viscosity and thermal conductivity of Ar, Kr, Xe, and O, XXXVII Panhellenic Conference on Solid State Physics and Materials Science, 17-20 September 2023, Thessaloniki, Greece.
12. F. Sofos, C. Dritselis, S. Misdanitis, T.E. Karakasidis, D. Valougeorgis, Data driven closed form expressions for computing the rarefied gas flow rate through circular tubes via machine learning techniques, Proceedings of the 4th European Conference on Non-equilibrium Gas Flows - NEGF23, 29-31 March, 2023, Eindhoven, the Netherlands.
13. A. Drakou, F. Sofos, T. Karakasidis, A. Tsangrassoulis, Adaptive thermal comfort model and active occupant behaviour in a mixed-mode apartment. A synergy to sustainability, Proceedings of the SBE23 "Sustainable built environments: Paving the way for achieving the targets of 2030 and beyond", March 2023, Thessaloniki, GR.
14. K. Papastamatiou, F. Sofos, T.E. Karakasidis, Calculating material properties with purely data-driven methods: From clusters to symbolic expressions. SETN '22: Proceedings of the 12th Hellenic Conference on Artificial Intelligence, 61, 1–9, September 2022, Corfu, GR.
15. F. Sofos, T.E. Karakasidis, M. Valasaki, C.G. Papakonstantinou, Mechanical and structural properties of FRP concrete: data-driven, machine learning approaches, XXXVI Pan-Hellenic conference on Solid-State Physics and Materials Science, 26-28 September 2022, Heraklion, Greece.
16. K. Papastamatiou, K.K. Exarhou-Kouveli, C. Stavrogiannis, F. Sofos, T.E. Karakasidis, From Lennard-Jones to real fluids: property extraction with symbolic regression, Materials Science and Engineering (MSE) 2022, 27-29 September 2022, Darmstadt, Germany.
17. F. Sofos, T.E. Karakasidis, The slip length as a material property: calculations at the nanoscale with machine learning tools, XXXV Panhellenic Conference on Solid State Physics and Materials Science, NCSR "Demokritos", 26-29 September 2021, Athens, Greece.
18. E. Chatzoglou, F. Sofos, A. Liakopoulos, SPH based study of confined microflows characterized by abrupt changes in cross-sectional area, ECOMAS: Particles 2021, Hamburg, Germany, October 2021.
19. D. Spetsiotis, F. Sofos, T.E. Karakasidis, A. Liakopoulos, Nanoscale flows for water purification applications, 3<sup>rd</sup> Efficient Water Systems Conference, Lefkada, GR, June 2018.

20. A. Liakopoulos, F. Sofos, T.E. Karakasidis, Modelling Environmental Flows with Lagrangian Particle Methods, 14th International Conference on Protection and Restoration of the Environment, Thessaloniki, GR, July 2018.
21. F. Sofos, T.E. Karakasidis, A.E. Giannakopoulos, A. Liakopoulos, Wall effects on diffusion coefficients in nanochannel flows, 11<sup>th</sup> International Conference on Diffusion in Solids and Liquids, Munich, Germany, June 2015.
22. F. Sofos, T.E. Karakasidis, A. Liakopoulos, The impact of slip on nanochannel friction factor, 8<sup>th</sup> GRACM International Congress on Computational Mechanics, Volos, GR, July 2015.
23. F. Sofos, T.E. Karakasidis, A.E. Giannakopoulos, A. Liakopoulos, Molecular dynamics methods for modelling blood flows at the micro/nano scale, 12<sup>th</sup> International Conference on Nanosciences & Nanotechnologies (NN15), 7-10 July 2015, Thessaloniki, Greece.
24. F. Sofos, T.E. Karakasidis, A.E. Giannakopoulos and A. Liakopoulos, Transport properties of fluids in hydrophobic/hydrophilic nanochannels, 4th Micro/Nanoflows Conf., London, UK, September 2014
25. F. Sofos, T.E. Karakasidis, A. Liakopoulos, Understanding the structure of fluid flows in nanodevices through molecular dynamics simulations, 12th International Conference on Protection and Restoration of the Environment, Skiathos, GR, July 2014
26. F. Sofos, T.E. Karakasidis, A. Liakopoulos, Darcy friction factor in nanoscale channel flows: a molecular dynamics study, 10th HSTAM International Congress on Mechanics May 2013, Chania, Crete, Greece.
27. F. Sofos, T.E. Karakasidis, A. Liakopoulos, Fluid/wall interactions in a nanofluidic system: the interface region, 9th International Conference on Nanosciences & Nanotechnologies (NN12), July 2012, Thessaloniki, Greece
28. F. Sofos, T.E. Karakasidis, A.E. Giannakopoulos, A. Liakopoulos, Transport properties of fluids in confined nanochannels: bridging nano to macro, 3rd Micro and Nano Flows Conference (MNF2011), August 2011, Thessaloniki, Greece.
29. F. Sofos, T.E. Karakasidis, A. Liakopoulos, Fluid flow at the nanoscale: how fluid properties deviate from the bulk, 8th International Conference on Nanosciences & Nanotechnologies (NN11), July 2011, Thessaloniki, Greece
30. F. Sofos, T.E. Karakasidis, and A. Liakopoulos, Fluid properties in rough-wall nanochannels, 2<sup>nd</sup> European Conference on Microfluidics, Toulouse, 2010
31. F. Sofos, T.E. Karakasidis, and A. Liakopoulos, Non-Equilibrium Molecular Dynamics Simulations of Channel Flows, Bulletin of the APS 52 (17), 2007.
32. F. Sofos, T.E. Karakasidis, and A. Liakopoulos, Variation of transport properties along nanochannels: a study by non-equilibrium molecular dynamics, IUTAM Symposium on Advances in Micro- and Nanofluidics, Dresden, 2007
33. IT role in agriculture and smart water management, International conference, Thessaly Region – Pinios River, Larissa, November 2018.
34. F. Sofos, T.E. Karakasidis, and A. Liakopoulos, Slip/No slip existence at the nanoscale, XXVI Panhellenic Conference on Solid State Physics and Materials Science, Ioannina, 2010.
35. D. Kasiteropoulou, F. Sofos, T.E. Karakasidis, A. Liakopoulos, Multiscale modeling in rough wall channels, Flow 2008, Kozani, November 2008.
36. T.E. Karakasidis, F. Sofos, D. Kasiteropoulou, A. Liakopoulos, Transport properties calculation with MD methods, Flow 2006, Patras, November 2006.
37. F. Sofos, Temperature measurements in 2D microflows, Marie-Curie ESOF 2012, July 2012, Dublin, IE.
38. P. Berillis, E. Mente, C. Simon, F. Sofos, I.T. Karapanagiotidis, Tubule and digestive cell area measurement of the digestive gland of lobsters. The role of image analysis into the digestive physiology,

The Crustacean Society Summer Meeting and the 10th Colloquium Crustacea Decapoda Mediterranea, July 2012, Athens.

39. F. Sofos, T.E. Karakasidis, A. Liakopoulos, Width effects on flows in nanochannels, XXV Panhellenic Conference on Solid State Physics & Materials Science, Thessaloniki, September 2009.
40. A. Liakopoulos, F. Sofos, T.E. Karakasidis, Molecular Dynamics to extract friction factor at the nanoscale 32<sup>th</sup> Panhellenic Conference on Solid State Physics and Materials Science, Ioannina, 2016.
41. F. Sofos, T.E. Karakasidis, A.E. Giannakopoulos, A. Liakopoulos, Molecular Dynamics simulations: a tool for studying micro and nano-bleeding, 2<sup>st</sup> Workshop on Fatigue of Materials used in Vascular Surgery, Thessaloniki, GR, May 2015.
42. F. Sofos, T.E. Karakasidis, A.E. Giannakopoulos, A. Liakopoulos, Modelling and simulation of size effects on liquid flows at small scales, 1<sup>st</sup> Workshop on Fatigue of Materials used in Vascular Surgery, Volos, GR, February 2015.
43. F. Sofos, T.E. Karakasidis, A. Liakopoulos, Argon shear viscosity calculation in a rough-wall nanochannel, Nanotech Conference & Expo 2011, June 2011, Boston MA, USA.
44. Presentation: F. Sofos, GASMEMS project presentation, 1<sup>st</sup> European Conference on Gas Microflows GASMEMS 2012, June 2012, Skiathos, GR.
45. Presentation: F. Sofos, HydroMedon, 2nd Panhellenic Meeting of post-graduate students, Volos, 2008.
46. Presentation: Analysis, Statistical processing and data presentation with open software, Open software for engineers meeting, TEE of C.-W. Thessaly, Larissa, 2018.

### **Invited Talks**

- “Molecular Dynamics and explainable Machine Learning methods to extract material properties”, Online workshop on Computational Materials Science, Department of Physics, UTh & Hellenic Society for the Science and Technology of Condensed Matter, 14-15 December 2024.
- “Towards explainable, interpretable, and physical-based artificial intelligence for materials science and engineering”, 21<sup>st</sup> International Conference on Nanosciences & Nanotechnologies (NN24), 2-5 July 2024, Thessaloniki, Greece.
- “Novel machine learning applications in physical sciences”, 20th Panhellenic Conference of the Hellenic Physical Society, “Physics meets the society” inventions – achievements – perspectives for physics in the 21<sup>st</sup> century, Lamia, 8-10 March 2024.
- “Symbolic regression: re-assessing fluid properties through analytical equations derived exclusively from data with physics-based descriptions”, at Nano-AI, NCSR Demokritos, GR, June 2022.

### **Other publications**

- 1 Post-doc technical report, Measurement of Temperature in a 2D Microchannel, Limerick, Ireland, 2012.
- 2 PhD Thesis: Fluid flows at the nanoscale: Numerical modelling with MD methods, Volos, GR, 2009.
- 3 MSc Thesis: Advanced pipelining methods, Xanthi, GR, 2002.
- 4 BSc Thesis: Design and implementation of a voltage stabilizer with DSP, Xanthi, 1999.