Prof. Andreas G. Yiotis

Chemical Engineer, PhD

PLACE/DATE OF BIRTH:	Athens, Greece, 14 June 1974
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Studies

1998 – 2003　　**PhD in Engineering**, National Technical University of Athens (NTUA), Greece
Thesis; 'Pore-network modeling of drying processes in macroporous materials'

1992 – 97　　**Diploma in Chemical Engineering**, School of Chemical Engineering, National Technical University of Athens (NTUA), Greece

Professional and Research Experience

8/2019-TODAY　　**Assistant Professor**, School of Mineral Resources Engineering, Technical University of Crete

3/2019　　**Darcy Visiting Scientist**, Darcy Center, Utrecht University, Netherlands
Hosted by Prof. M. Hassanisadeh

6/2018, 11/2018 & 1/2014, 6/2014　　**Visiting Researcher,** Laboratoire FAST (Fluides, Automatique et Systèmes Thermiques), Centre National de la Recherche Scientifique (CNRS), Paris, France
Hosted by Prof. D. Salin and Dr. L. Talon

11/2012 – TODAY　　**Associate Researcher**, Environmental Research Laboratory, National Center for Scientific Research 'Demokritos', Athens, Greece

8/2016-5/2017　　**Process Engineer**, SBS Steel Belt Systems S.R.L., Villafranca Tirrena, Italy

9/2010 – 8/2012　　**Marie Curie Fellow,** Laboratoire FAST (Fluides, Automatique et Systèmes Thermiques), Centre National de la Recherche Scientifique (CNRS), Paris, France

1/2005 – 8/2010　　**Post-Doctoral Researcher,** Environmental Research Laboratory, National Center for Scientific Research 'Demokritos', Athens, Greece

3/2010 – 4/2010　　**Post-Doctoral Researcher,** School of Chemical Engineering, National Technical University of Athens, Greece

9/2007　　**Visiting Researcher**, Barcelona Supercomputing Center (BSC), Barcelona, Spain
Funded by the Spanish programme Infraestructura Científica y Tecnológica Singular del Estado Español (ICTS), Spanish Ministry of Education & Science

3/2006   **Visiting Researcher**, Departamento de Inginieria del Terreno y Cartografica, Technical University of Catalunya (UPC), Barcelona, Spain
Hosted by prof. Jesus Carrera under the EC funded HPC-Europa programme

12/2002   **Visiting Research Assistant**, Department of Chemical Engineering, University of Southern California, Los Angeles, USA - Hosted by prof. Y.C. Yortsos

7/2001 – 9/2001   **Visiting Research Assistant**, Edinburgh Parallel Computing Center (EPCC), University of Edinburgh, United Kingdom
Hosted by prof. Ken Sorbie under the EC funded TMR-TRACS programme

9/1996 – 1/1997   **Undergraduate Research Assistant**, Institute of Physical Chemistry, National Center for Scientific Research 'Demokritos', Athens, Greece

Main Fields of Research

My research focuses on transport phenomena in porous media, primarily of geological origin, but also other composite or heterogeneous materials encountered in environmental and energy-related applications, such as membranes, fibrous structures and porous silica nanoparticles. In particular, I study single and multiphase flows, heat and solute transport in such materials using an integrated combination of rigorous pore-scale flow and transport simulation tools (both self-made and commercial) and experimental studies within micro-engineered 2D and 3D porous structures and microfluidic devices.

More specifically my main fields of research are the following;

Multiphase flows and transport processes in macroporous materials, e.g. soils, petroleum reservoirs, granular/fibrous media (Research funded by a series of EU Projects; MAGIC-OR, ENVITRACER, ENTEC, REAL PORE FLOWS, PERL, GLOW, 3DmicroPores) **;**
- Pore-scale modeling of evaporative drying of volatile hydrocarbons from fractured petroleum reservoirs using pore-network models (Publications A1-5, A8, A11-12, A21, C1-4)
- Pore-scale modeling of single/two-phase flows in pore networks and reconstructed porous domains using Lattice-Boltzmann and Phase-field models (Publications A6-7, A9-10, A13, A17, A24, C9)
- REV-scale modeling of Primary and Secondary Oil Recovery processes in petroleum reservoirs using Black-Oil schemes
- Experimental studies of drying of volatile hydrocarbons from model porous media (Publications A15-16, C8)
- Experimental studies of ganglia population dynamics within micro-engineered porous structures (Publication A19)

Fuel cell thermodynamics – Numerical modeling of reactive flows and heat transfer in metal hydride tanks for Hydrogen storage (Research Funded by a series of EU Projects; NESSHY, H2FC, BOR4STORE)
- Process design and modeling of thermally coupled H_2 storage/Fuel Cell systems (Publications A18, A20)
- Reconstruction and pore-scale characterization of fuel cell components (Publication A22-23, C12)

High Performance Scientific Computing – Efficient Numerical Modeling - Parallel Programming (Supported by a series of EU and National Grants (Greek and Spanish) for training and large scale computations in major EU HPC centers; MareNostrum (Spain), EPCC (UK), IDRIS (France), ARIS (Greece))
- Development of massively parallel Lattice Boltzmann codes using MPI libraries for pore-scale simulations of transport processes in 2D & 3D porous domains (immiscible flows, hydrodynamic dispersion, non-newtonian flows) (Publications A6-7, A9-10, A13, A17, C9)
- Setup and administration of Beowulf-class computer clusters using ROCKS for compute intensive

applications, such as Weather Forecasting and CFD applications (Publications B1, A14, C6-7)

Controlled Drug Release from Mesoporous Silica Nanoparticles (EU Funded Projects; MOZART)
- Continuum scale modeling of drug release at the pore and particle scale from silica matrices
- Atomistic scale modeling for the calculation of transport properties within nanonopores

Research Grants

2018: Excellence Research Grant (€180k); Hellenic Foundation for Research and Innovation (ΕΛΙΔΕΚ); '**3DmicroPores** – Micro/Macro scale couplings in reactive transport processes in porous materials. Realistic 3D experiments towards Rigorous upscaled models' – Role: Lead PI

2010: Marie Curie Grant (€230k); Call: FP7-PEOPLE-IEF-2009; '**REAL PORE FLOWS** - Towards the deterministic modeling of immiscible flows in porous media: Mesoscale simulations and Experimental verification' – Role: Author and Beneficiary Researcher

2009: ERC Starting Grant (€1.1M); Call: FP7-IDEAS-2009; **'HYDROFAKIR -** Roughness design towards reversible non-/ full-wetting surfaces: From Fakir Droplets to Liquid Films**'** – Role: Co-author & Post-doctoral researcher

2000: Embirikion Foundation Grant (€9k) – 'Experimental studies of evaporative drying in macroporous media' - Role: Author & Beneficiary PhD fellow

Distinctions and Awards

Darcy Center Visiting Scientist (25/3-5/4/2019), Invited at the University of Utrecht by Prof. Majid Hassanisadeh (https://www.darcycenter.org/visitors/)

Seal of Excellence Award by the European Commission (2018) for the proposal GEOSTORE submitted jointly with the University of Stuttgart and Princeton University under call H2020-MSCA-IF-2017

Outstanding Reviewer Award (2017) by the editors of the International Journal of Heat and Mass Transfer & International Journal of Thermal Sciences in recognition of contributions made to the quality of the journals (ranking within the top 10th percentile of reviewers)

Expert Evaluator for the Research Executive Agency (Environment and Geosciences Panel & Engineering Panel, EU), Agence Nationale de la Recherche (ANR, France), Swiss National Science Foundation (SNSF, Switzerland), Cyprus Research Promotion Foundation (RPF, Cyprus)

Reviewer for more than 26 international peer-review journals (published by Elsevier, Springer, American Physical Society, American Chemical Society, American Geophysical Society etc)

PhD fellowship funded by the Greek Ministry of Development (1998-2002). Budget €33k

Thomaidis Foundation Award (2002 & 2003) for research papers published in peer-review journals, National Technical University of Athens, Greece

Teaching activities

2019-onwards
- **Drilling Engineering**, 9th Semester Undergraduate Course, School of Mineral Resources Engineering, Technical University of Crete, 39h per semester
- **Drilling Engineering**, Master in Petroleum Engineering Program, Technical University of Crete, 39h per semester

2020-onwards
- **Fluid Mechanics**, 6th Semester Undergraduate Course, School of Mineral Resources Engineering, Technical University of Crete, 52h per semester

Organized Conference Sessions and Seminars

2019 **Short course** on "Microfluidics: Experimental and numerical approaches of multi-phase flow and transport in porous media"in the context of the **11th Interpore Annual Meeting**, Valencia, Spain, 6-10 May 2019 – Role: Organizer & Speaker in collaboration with Nikos Karadimitriou, University of Stuttgart, and Ioannis Zarikos, University of Eidhoven

2015 **Minisymposium** on "Multiscale modeling of transport processes in Fuel Cell and hydrogen economy related applications" in the context of the **7th International Conference on Porous Media (INTERPORE)**, Padova, Italy, 18-21 May 2015 – Role: Organizer & Co-chairman with Dr. Marc Prat, Institut de Mécanique des Fluides de Toulouse (CNRS) and Dr. Joel Pauchet, CEA/Liten, Grenoble

2009 **Cluster School Seminar**, 28/09-02/10/2009, National Center for Scientific Research 'Demokritos', Athens, Greece. A 5-day course on Computer Clusters, Parallel and High Performance Scientific programming for the academia and private companies – More than 30 participants - Role: Organizer & Lecturer

2009 **Cluster School Seminar**, 23-27/11/2009, National Center for Scientific Research 'Demokritos', Athens, Greece - More than 30 participants - Role: Organizer & Lecturer

Tutoring/mentoring activities

PhD students
- **Mrs. Anastasia Dollari**, PhD candidate (2018-today) in cotutelle at Universite Paris-Saclay (France) and National Technical University of Athens (Greece). Joint advising with Dr. Laurent Talon and Prof. Andreas Boudouvis. **Thesis title (tentative)**; "Experimental and numerical study of micro-macro scale couplings in multiphase flows with model porous media"
- **Mr. Konstantinos Papadopoulos**, PhD candidate (2020-today) **Thesis title (tentative)**; "Determination of tracer partitioning dynamics across liquid-oil interfaces using molecular dynamics simulations", Joint advising with Dr. Michalis Kainourgiakis, NCSRD
- **Dr. Yannis Pcihogios**, PhD in Chemical Engineering, NTUA (2012). **Thesis title;** "Lattice-Boltzmann modelling of single and multiphase flows through macroporous media". Joint advising with Dr. Michalis Kainourgiakis, NCSRD

MSc students
- **Mrs. Anastasia Dollari**, MSc in Petroleum Engineering, Technical University of Crete (2018); **Thesis

title; "Advanced numerical methods for modeling pressure maintenance strategies during secondary and tertiary oil recovery in petroleum reservoirs". Joint advising with Dr. Christos Chatzichristos, NCSRD

- **Dr. Vangelis Kouvelos**, MSc in Computational Fluid Dynamics, NTUA (2017), **Thesis title;** "Theoretical investigation of pharmaceutical substances release from nanoporous carriers". Joint advising with Prof. Andreas Boudouvis, NTUA
- **Mr. Kostantinos Pandis**, MSc in Petroleum Engineering, Technical University of Crete (2015), **Thesis title;** "Modeling Single & Multi-phase flows in petroleum reservoirs using Comsol Multiphysics: Pore to field-scale effects". Joint advising with Dr. Christos Chatzichristos, NCSRD

<u>Undergraduate students</u>
- **Mr. Michalis Pianos**, Diploma Thesis, TUC (In progress)
- **Mr. Vryonis Georgiou**, Diploma Thesis TUC (In progress)
- **Mr. Dimitris Papadimitriou**, Diploma thesis, NTUA (2018-today), **Thesis title;** "Effects of micro-heterogeneities on the hydrodynamic dispersion and permeability of bidisperse sphere packings". Joint advising with prof. Andreas Boudouvis, NTUA
- **Mr. Lefteris Kosmidis**, Internship, NCSR Demokritos (2014), **Title;** "Numerical modeling of hydrogen release dynamics from thermally coupled metal hydride and fuel cell systems"

Computer and Programming Skills

- Expert in Fortran 90 and parallel programming with MPI
- Significant experience in developing scientific software for single, multiphase flows and phase change porous materials; Pore network and Lattice-Boltzmann modeling
- Significant experience in deploying parallel codes in massively parallel computers, e.g. IDRIS (France), Marenostrum (Spain), Edinburgh Parallel Supercomputing Center (UK), ARIS (Greece)
- Significant experience in setting-up and administrating Beowulf-class Linux-based computer clusters
- Fluent user of Matlab, Mathematica, COMSOL Multiphysics

Reviewer for Journals and Funding Bodies

Peer-review journals;
Physical Review E, Physical Review Letters, Physical Review Applied, Physical Review Fluids, AIChE Journal, Langmuir, Water Resources Research, Geophysical Research Letters, Advances in Water Resources, Journal of Colloid and Interface Science, Colloids and Surfaces A, International Journal of Hydrogen Energy, Chemical Engineering Science, International Journal of Heat and Mass Transfer, Transport in Porous Media, SPE Journal, Drying Technology, Brazilian Journal of Chemical Engineering, Oil & Gas Science and Technology, ASME Journal of Fluids Engineering, International Journal of Energy Research, Energy Conversion and Management, Journal of Hydrologic Engineering, International Journal of Thermal Sciences, Soft Matter, Journal of Petroleum Science and Engineering, Applied Sciences, Scientific Reports

External reviewer/expert;
Research Executive Agency - Marie Sklodowska-Curie Actions – Environmental & Geosciences Panel, Engineering Panel (EU)
Swiss National Science Foundation (Switzerland)
Agence Nationale de la Recherche, ANR (France)
Cyprus Research Promotion Foundation (RPF, Cyprus)

Annex A: Scientific Production

24 publications in peer-review journals (18 as first and 14 as corresponding author) &
12 peer-reviewed publications in conference proceedings
More than **750 hetero-citations, h-index=13** (Web of Science), **i-10 index=17** (Google Scholar)

Publications in peer-reviewed journals

A24. **Yiotis, A.G.**, Dollari, A., Kainourgiakis, M.E., Salin, D. & Talon, L., "*Nonlinear Darcy flow dynamics during ganglia stranding and mobilization in heterogeneous porous domains*", Physical Review Fluids 4, 114302, (2019)

A23. Stamatakis, E, **Yiotis, A.G.**, Gianissi, S., Tolias, I, & Stubos, A.K., "*Modeling and simulation supporting the application of fuel cell & hydrogen technologies*", Journal of Computational Science 17, 10-20, (2017)

A22. **Yiotis, A.G.**, Kainourgiakis, M.E., Charalambopoulou, G., Stubos, A.K., "*Microscale characterization of stochastically reconstructed carbon fiber-based Gas Diffusion Layers; Effects of anisotropy and resin content*", Journal of Power Sources 320, 153, (2016)

A21. **Yiotis, A.G.**, Salin, D., Y.C. Yortsos, "*Pore network modeling of drying processes in macroporous materials; Effects of gravity, mass boundary layer and pore microstructure*", Transport in Porous Media 110, 175 (2015)

A20. **Yiotis, A.G.**, Kainourgiakis, M.E., Charalambopoulou, G., Stubos, A.K., "*A generic physical model for a thermally integrated High-Temperature PEM Fuel Cell and Sodium Alanate tank system*", International Journal of Hydrogen Energy 40, 14551 (2015)

A19. T. Chevalier, D. Salin, L. Talon and **A. Yiotis**, "*History effects on nonwetting fluid residuals during desaturation flow through disordered porous media*", Physical Review E 91, 043015 (2015)

A18. **Yiotis, A.G.**, Kainourgiakis, E.I. Kosmidis, M.E., Charalambopoulou, G., Stubos, A.K., "*Thermal coupling potential of SOFCs with metal hydride tanks: Thermodynamic and design considerations towards integrated systems*", Journal of Power Sources, 269, 440-450 (2014)

A17. **Yiotis, A.G.**, Talon, L. Salin, D., "*Blob population dynamics during immiscible 2-phase flows in reconstructed porous media*", Physical Review E, 87, 033001 (2013)

A16. **Yiotis, A.G.**, Salin, D., Tajer, E., Yortsos, Y.C., "*Drying in porous media with gravity-stabilized fronts: Experimental results*", Physical Review E, 86, 026310 (2012)

A15. **Yiotis, A.G.**, Salin, D., Tajer, E., Yortsos, Y.C., "*Analytical solutions of drying in porous media for gravity-stabilized fronts*", Physical Review E, 85, 046308 (2012)

A14. Andronopoulos, S., Sfetsos, A., Vlachogiannis, D., **Yiotis, A.** & Gounaris, N. *"Application of adjoint CMAQ chemical transport model in the Athens greater area: Sensitivities study on ozone concentrations,* International Journal of Environment and Pollution, 193 (2011)

A13. Kikkinides, E.S., Kainourgiakis, M.E., **Yiotis, A.G.**, Stubos, A.K., "*Lattice Boltzmann method for Lennard-Jones fluids based on the gradient theory of interfaces*", Physical Review E, 82(5), 056705 (2010)

A12. **Yiotis, A.G.**, Tsimpanogiannis, I.N., Stubos, A.K., "*Fractal Characteristics and Scaling of the Drying Front in Porous Media: A Pore-Network Study*", Drying Technology 28(8), 981-990 (2010)

A11. **Yiotis, A.G.**, Tsimpanogiannis, I.N., Stubos, A.K., "*Three-Dimensional Modeling of the Evaporation of Volatile Hydrocarbons from Anisotropic Porous Media*", Journal of Porous Media, 13(3), 209-219 (2010)

A10. **Yiotis, A.G.**, Kainourgiakis, M.E., Kikkinides, E.S., Stubos, A.K., "*Application of the Lattice-Boltzmann method to the modeling of Population Blob Dynamics in 2D Porous Domains*", Computers and Mathematics with Applications, 59(7), 2315-2325 (2010)

A9. Kikkinides, E.S., **Yiotis, A.G.**, Kainourgiakis, M.E., Stubos, A.K., "*Thermodynamic consistency of liquid-gas lattice Boltzmann methods: Interfacial property issues*", Physical Review E, 78(3), 036702 (2008)

A8. **Yiotis, A.G.,** Tsimpanogiannis, I.N., Stubos, A.K., Yortsos, Y.C., "*Coupling between internal and external mass transfer during drying of a porous medium*", Water Resources Research, 43, W06403 (2007)

A7. Psihogios, J. , Kainourgiakis, M.E., **Yiotis, A.G.**, Papaioannou, A., Stubos, A.K., "*A Lattice Boltzmann study of Non-Newtonian flow in reconstructed porous domains*", Transport in Porous Media, 70(2), 279-292 (2007)

A6. **Yiotis, A.G.**, Psihogios, J., Kainourgiakis, M.E., Papaioannou, A., Stubos, A.K., "*A Lattice-Boltzmann study of viscous coupling effects in immiscible two-phase flow in porous media*", Colloids and Surfaces A, 300(1-2), 35-49 (2007)

A5. **Yiotis, A.G.**, Tsimpanogiannis, I.N., Stubos, A.K., Yortsos, Y.C., "*Pore-network study of the characteristic periods in the drying of porous media*", J Colloid Interface Science, 297(2), 738-748 (2006)

A4. **Yiotis, A.G.**, Stubos, A.K.; Boudouvis, A., Tsimpanogiannis, I.N. & Yortsos, Y.C., "*Pore Network Modelling of Isothermal Drying in Porous Media*", Transport in Porous Media, 58 (1-2), 63-86 (2005). Also appears in "Upscaling Multiphase Flow in Porous Media: From Pore to Core and Beyond", Das, D.B., Hassanizadeh, S.M. (Eds), Springer (2005)

A3. **Yiotis, A.G.**, Boudouvis, A.G, Stubos, A.K, Tsimpanogiannis, I.N. & Yortsos, Y.C., "*Effect of liquid films on the drying of porous media*", AIChE J, 50(11), 2721-2737 (2004)

A2. **Yiotis, A.G.**, Boudouvis, A.G. Stubos, A.K., Tsimpanogiannis, I.N. & Yortsos, Y.C., "*The effect of liquid films on the isothermal drying of porous media*", Physical Review E, 68(3), 037303 (2003)

A1. **Yiotis, A.G.**, Stubos, A.K. Boudouvis, A.G. & Yortsos, Y.C., "*A 2-D pore-network model of the drying of single-component liquids in porous media*", Advances In Water Resources, 24, 439-460 (2001)

Publications as conference papers (with peer-review)

C12. Stamatakis, E., **Yiotis, A.G.**, Giannissi, S., Tolias, I. & Stubos, A.K, "*Modeling and Simulation Supporting the Application of Fuel Cell & Hydrogen Technologies*", Journal of Computational Science, 27, 10 (2018)

C11. Meidanis, I., Halikias, G.D., Giovenco, R., **Yiotis, A.G.** & Chrysagis, K., "*Closed-loop Identification of an Industrial Extrusion Process*", IFAC-Papers OnLine, 50, 15604-15609 (2017)

C10. Meidanis, I., Halikias, G.D., Giovenco, R., **Yiotis, A.G.** & Chrysagis, K., "*Identifications and Model Predictive Control Design of a Polymer Extrusion Process*", Computer Aided Chemical Engineering, 40, 1609-1614 (2017)

C9. Kikkinides, E.S., Kainourgiakis, M.E., **Yiotis, A.G.** & Stubos, A.K., "*A Lattice Boltzmann Method for Non Ideal Gases Based on the Gradient Theory of Interfaces*", Computer Aided Chemical Engineering, 29, 1598-1602 (2011)

C8. **Yiotis, A.G.**, Tsimpanogiannis, I.N. & Stubos, A.K. "*Experimental study of drying/evaporation in an effective 2D porous medium*", Technical Proceedings of the 2010 NSTI Nanotechnology Conference and Expo, Vol 2, 432-435 (2010)

C7. Vlachogiannis, D., Sfetsos, A., Andronopoulos, S., Gounaris, N., **Yiotis, A.** & Stubos A.K., "*The « Demokritos » web-based air quality forecasting system for the Greater Athens Area*", Proceedings of the Int. Congress on Environmental Modelling and Software, Vol. 2, 1146-1153 (2008)

C6. Andronopoulos, S., Sfetsos, A., Vlachogiannis, D., Gounaris, N. & **Yiotis, A.**, "*Application of adjoint CMAQ chemical transport model in the Greater Athens Area: Sensitivities study on ozone concentrations*", Hrvatski Meteoroloski Casopis, 4, 249-253 (2008)

C5. N.I. Papadimitriou, I.N. Tsimpanogiannis, **A.G. Yiotis**, T.A. Steriotis & A.K. Stubos, "*On the use of the*

kihara potential for hydrate equilibrium calculations", Proceedings of the 11th International Conference on Physics and Chemistry of Ice, 475-482 (2007)

C4. **A.G. Yiotis**, A.K. Stubos, I.N. Tsimpanogiannis, Y.C. Yortsos, "*Three-dimensional modelling of the evaporation of volatile hydrocarbons from anisotropic porous media*", SPE 97032, Proceedings of the SPE ATCE 2005, 4017-4023 (2005)

C3. **A.G. Yiotis**, A.G. Boudouvis, A.K. Stubos, I.N. Tsimpanogiannis, Y.C. Yortsos, "*Capillarity-Induced Flow In Wetting Liquid Films: Implications for the Recovery of Volatile Oils From Fractured Porous Media*", SPE 90744, Proceedings of the SPE ATCE 2004, 3767-3778 (2004)

C2. **A.G. Yiotis**, A.K. Stubos, A.G. Boudouvis, Y.C. Yortsos, "*A pore network model for drying processes in porous media*", Proceedings of the ASME, HTD 369 (2), pp. 53-60 (2001)

C1. **A.G. Yiotis**, A.K. Stubos, A.G. Boudouvis , "A pore network model for drying processes in porous media", In CD-Rom Proceedings of the European Congress on Computational Methods in Applied Sciences and Engineering (ECCOMAS), E. Onate et al., Eds , Barcelona, Spain, September 2000.

Book Chapters

B4. Kikkinides, E.S., Kainourgiakis, M.E., **Yiotis, A.G.** & Stubos, A.K., "A Lattice Boltzmann Method for Non Ideal Gases Based on the Gradient Theory of Interfaces", in 21st European Symposium on Computer Aided Process Engineering, Pistikopoulos, E., Georgiadis, M.C. 7 Kokossis, A.C. (Eds), Elsevier (2011)

B3. **Yiotis, A.G.**, Stubos, A.K., Boudouvis, A., Tsimpanogiannis, I.N. & Yortsos, Y.C., "Pore Network Modelling of Isothermal Drying in Porous Media", in Upscaling Multiphase Flow in Porous Media: From Pore to Core and Beyond, Das, D.B., Hassanizadeh, S.M. (Eds), Springer (2005)

B2. **Yiotis, A.G.**, Stubos, A.K, Boudouvis, A.G., Tsimpanogiannis, I.N & Yortsos, Y. C. "Modelling of Drying Processes in Pore Networks", in Mathematics in Industry. Volume 8: Progress in Industrial Mathematics at ECMI 2004, A. Di Bucchianico et al., (Eds), Springer-Verlag, Berlin, Germany (2006)

B1. **Yiotis, A.G.**, Kainourgiakis, M.E. & Stubos, A.K.,"A Lattice-Boltzmann study of immiscible two-phase flow in pore networks", in Science and Supercomputing in Europe, Alberigo, P., Erbacci, G., Garofalo, F. (Eds), CINECA (2006)

Invited talks

I14. "Non-Darcian steady-state flow regimes during the stranding and mobilization of NAPL ganglia within digital porous media", Darcy Center Lecture, Utrecht University, Netherlands, April 3, 2019 (Invited by Prof. Majid Hassanisadeh)

I13. "Non-Darcian steady-state flow regimes during the stranding and mobilization of NAPL ganglia within digital porous media", University of Eindhoven, Netherlands, April 2, 2019 (Invited by Dr. Chaozhong Qin)

I12. "Effective steady-state flow regimes during the stranding and mobilization of NAPL ganglia within stochastically reconstructed porous domains", SFB 1313 Status Seminar, University of Stuttgart, Germany, January 22, 2019 (Invited by Prof. Holger Steeb)

I11. "Effective steady-state flow regimes during the stranding and mobilization of NAPL ganglia within stochastically reconstructed porous domains", Darcy Center Workshop, Utrecht University, Utrecht, The Netherlands, December 6, 2018 (Invited by Prof. Majid Hassanizadeh)

I10. "Current research trends in technologies related to Secondary and Enhanced Oil Recovery", PetroChem Day, Athens, Greece, May 4, 2018 (Invited by the Chemecon NTUA student association)

I9. "A pore-scale numerical and experimental study of non-wetting phase residual dynamics in predominately

2D reconstructed porous media", Stuttgart Research Partnership NUPUS Meeting, Mühlhausen im Täle, Germany, October 10, 2017 (Invited by Prof. Rainer Helmig)

I8. "Evaporative drying of macroporous materials; From Experimental Studies to Pore Network Modelling", Otto-von-Guericke-Universität, Magdeburg, Germany, November 11, 2015 (Invited by Prof. Evangelos Tsotsas)

I7. "Thermally coupled storage tank-fuel cells systems", European Technical School on Hydrogen and Fuel Cells 2015, Heraklion, Greece, June 25, 2015 (Invited by Dr. Athanassios Stubos)

I6. "Thermally coupled storage tank-fuel cells systems", European Technical School on Hydrogen and Fuel Cells 2014, Rethymnon, Greece, June 26, 2014 (Invited by Dr. Athanassios Stubos)

I5. "Drying of porous media in the presence of gravity: Experimental Results and Pore Network Modeling", Session on Evapotranspiration from Heterogeneous Terrestrial Surfaces, American Geophysical Union Fall Meeting, San Francisco, USA, December 8, 2011 (Invited by Prof. Nima Shokri)

I4. "Experimental and Numerical Study of drying in porous media in the presence of gravity", Soil and Terrestrial Physics Group (STEP), ETH, Zurich, Switzerland, November 22, 2011 (Invited by Prof. Dani Or)

I3. "Pore-scale modeling of transport processes in porous media guided by experimental studies; Drying and NAPL dynamics", GEMP, Institut de Mechanique des Fluides de Toulouse, Toulouse, France, October 21, 2011 (Invited by Dr. Marc Prat)

I2. "A Lattice Boltzmann model for the flow of Newtonian and Non-Newtonian fluids in Porous Media" Departamento de Ingeneria del Terreno y Cartografica, Universitat Politecnica de Catalunya, Barcelona, Spain, March 23, 2006 (Invited by Prof. Jesus Carrera)

I1. "Efficient modeling of single/two-phase flows in confinements using the Lattice-Boltzmann method", Summer School 2007, National Center for Scientific Research 'Demokritos', Athens, Greece, July 2007.

Presentations in international conferences

P15. Chevalier T., Talon L., Salin D. and Yiotis A.G., "History of non-wetting fluid residuals during desaturation flow through disordered porous media", 7th International Conference on Porous Media (INTERPORE), Padova, Italy, 18-21 May 2015.

P14. Kainourgiakis M.E., Yiotis A.G., Charalambopoulou G., & Stubos A.K., "Advanced numerical methods for the stochastic reconstruction and pore scale characterization of Gas Diffusion Layers", 7th International Conference on Porous Media (INTERPORE), Padova, Italy, 18-21 May 2015.

P13. Yiotis A.G., Kainourgiakis M.E., Kosmidis L., Charalambopoulou G., & Stubos A.K., "Thermally coupled Hydrogen Storage- Fuel Cell systems", Euromediterranean Hydrogen Technologies Conference (EmHyTec) Taormina, Italy, 9-12 December 2014.

P12. Chevalier T., Yiotis, A.G., De Fretes, M., Talon L. & Salin D., "Two-phase flows blob dynamics on reconstructed porous media: Experiments and Numerical Simulations", 10th European Fluid Mechanics Conference, Copenhagen, Denmark, 14-18 September 2014.

P11. Yiotis, A.G., Salin, D., Tajer, E.S. & Yortsos, Y.C., "Buoyant drying in porous media: Experiment versus Theory", 5th International Conference on Porous Media (INTERPORE), Prague, Czech Republic, 22-24 May 2013. **(Invited presentation)**

P10. Yiotis, A.G., Salin, D., Tajer, E.S. & Yortos, Y.C., "Drying of porous media in the presence of gravity: Experimental Results and Pore Network Modeling", Abstract H41J-03 presented at 2011 Fall Meeting, AGU, San Francisco, California, USA, 5-9 December, 2011. **(Invited presentation)**

P9. Kikkinides, E.S., Kainourgiakis, M., Yiotis, A.G. & Stubos, A.K., "Liquid-gas equilibrium thermodynamics and bubble dynamics using a Lattice-Boltzmann model for Lennard-Jones fluids", International Conference

for Mesoscopic Methods in Engineering and Science (ICMMES), Lyon, France, 4-8 July, 2011.

P8. Yiotis, A.G., Kainourgiakis, M., Stubos, A & Salin, D. "Modeling blob dynamics in pore networks by means of the Lattice-Boltzmann method", 3rd International Conference on Porous Media (INTERPORE), Bordeaux, France, 29-31 March 2011.

P7. A.G. Yiotis, M.E. Kainourgiakis, A.K. Stubos, "Deterministic Study of Population Ganglion Dynamics in Pore Networks using Lattice Boltzmann Modelling", 5th International Conference for Mesoscopic Methods in Engineering and Science, Amsterdam, The Netherlands, 16-20 June 2008.

P6. A.G. Yiotis, M.E. Kainourgiakis, A.K. Stubos, "Lattice Boltzmann modelling of residual NAPL's flow in underground porous domains, European Geosciences Union, Vienna, Austria, 15-20 April 2007.

P5. A.G. Yiotis, J. Psihogios, M.E. Kainourgiakis, A. Papaioannou, A.K. Stubos, "A Lattice-Boltzmann study of immiscible 2-phase flow in reconstrusted porous media", TRI/Princeton Workshop, Princeton, NJ, USA, 21-23 June 2006.

P4. A.G. Yiotis, I.N. Tsimpanogiannis, A.K. Stubos, Y.C. Yortsos, "Pore-network modelling of convective drying", Computational Methods in Water Resources CMWR-XVI, Copenhagen, Denmark, 19-22 June 2006.

P3. A.G. Yiotis, A.K. Stubos, A.G. Boudouvis, I.N. Tsimpanogiannis, Y.C. Yortsos, "Modelling of drying processes in pore networks", 13th European Conference on mathematics in Industry, Eindhoven, The Netherlands, June 21-25, 2004. Also appears in "Progress in Industrial Mathematics at ECMI 2004", vol. 8, pp. 293-297, A. Di Bucchianico, R.M.M. Mattheij, M.A. Peletier (Eds), Springer (2005).

P2. A.G. Yiotis, A.G. Boudouvis, A.K. Stubos, I.N. Tsimpanogiannis, Y.C. Yortsos, "Modelling Viscous Flow Through Liquid Films In Isothermal Drying Of Porous Media", AIChE 2003 Annual Meeting, San Francisco, California, USA, November 2003.

P1. A.G. Yiotis, A.K. Stubos, A.G. Boudouvis, Y.C. Yortsos , "A pore network model for drying processes in porous media", AIChE 2001 Annual Meeting, Reno, Nevada, USA, November 2001.

14. "3DmicroFlows – Micro/macro scale couplings in reactive transport processes in porous materials; Realistic 3D experiments towards rigorous upscaled models", Excellence Research Grant, Hellenic Foundation for Research and Innovation (ΕΛΙΔΕΚ) (2018-2021).
Activities; Development of realistic 3D porous structure prototypes of geologic materials using novel Additive Methodologies. Experimental study of Reactive Immiscible Flows using state-of-the-art 3D imaging techniques and Development of rigorous REV-scale models.

13. "MOZART - MesopOrous matrices for localiZed pH-triggered releAse of theRapeuTic ions and drugs", H2020 Grant (2015-2018)
Activities; Development of an integrated multiscale modeling framework for the simulation of release dynamics from Mesoporous Silica nanoparticles and the in-silico design of novel drug carriers. Study of the effects of nanoporosity on drug release dynamics.

12. "H2FC - Integrating European Infrastructure to support science and development of Hydrogen- and Fuel Cell Technologies towards European Strategy for Sustainable, Competitive and Secure Energy", FP7-INFRASTUCTURES Grant (2011-2015)
Activities; Process design for optimized thermal management in coupled Fuel Cell and Metal Hydride systems. Continuum-scale modeling of heat transfer, desorption kinetics and flow within porous metal hydride tanks.

11. "GLOW - New weather-stable low gloss powder coatings based on bifunctional acrylic solid resins and nanoadditives", FP7- Grant 324410 (2013-2017)
Activities; Design optimization of cooling belt and twin-screw extruder components for the production of powder coatings using COMSOL Multiphysics

10. "BOR4STORE – Fast, reliable and cost effective boron hydride based high capacity solid state hydrogen storage materials", FCH JU Grant 303428 (2012-2015).
Activities; Thermodynamics and modeling of thermally coupled metal hydride/Fuel Cell systems using COMSOL Multiphysics.

9. "ENTEC – Enhancing the capacity for Environmental Technology and Climate Research, EU-funded (2013-2015). Activities; Modeling soil-ambient interactions during flow and evaporative drying using pore network and Lattice-Boltzmann models.*

8. "REAL PORE FLOWS - Towards the deterministic modeling of immiscible flows in porous media: Mesoscale simulations and Experimental verification", FP7-PEOPLE, Intra-European followship for Career Development (2010-2012) (Scientist in Charge: Prof. D. Salin, CNRS, France)
Activities; Experimental and theoretical study, pore-network and Lattice Boltzmann modeling of drying and immiscible flow dynamics in stochastically reconstructed porous media.

7. "HYDROFAKIR - Roughness design towards reversible non- / full-wetting surfaces: From Fakir Droplets to Liquid Films", FP7-IDEAS, ERC Starting Grant (2010-2015) (Principal Investigator: Dr. A. Papathanasiou, NTUA, Greece)
Activities; Lattice-Boltzmann modeling of sessile droplet dynamics during Cassie-Wenzel transitions on patterned superhydrophopic surfaces. Study on the effects of surface roughness on hydrophobic properties.

6. "NESSHY - Novel Efficient Solid Storage for H2", FP6 Integrated Project, Contract no. SES6-518271 (2006-2011) (Scientist in charge: Dr. A. Stubos, NCSR Demokritos, Greece)
Activities; Development of parallel single and 2-phase Lattice-Boltzmann models for modeling immiscible flows in macroporous media.

5. "PERL - Enhancing the Research Potential of the NCSR Demokritos Environmental Research Laboratory in the European, National and Regional Research Areas", FP7 Integrated Project (2009-2011) (Scientist in charge: Dr. A. Stubos, NCSR Demokritos, Greece)
Activities; Design and setup of a High Performance Beowulf cluster for massively parallel simulations. Setup

of an operational weather and pollution forecasting parallel MM5-CMAQ system for the greater Athens area

4. "Innovation Pole of Western Macedonia-Energy Plus", General Secretariat of Research and Technology, Greek ministry of Development (2007-2008) (Scientist in charge: Dr. A. Stubos, NCSR Demokritos, Greece)
Activities; Design and setup of a High Performance Beowulf cluster for massively parallel simulations. Setup of an operational weather and pollution forecasting parallel MM5-CMAQ system for the greater Athens area

3. "ENVITRACER - Development of environmentally friendly tracer technology for improved reservoir description" ENK6-CT-2002-00602 (2002-2006) (Scientist in charge: Dr. A. Stubos, NCSR Demokritos, Greece)
Activities; Development of pore-network models for 2-phase flow and mass dispersion in porous media

2. "MAGIC/OR - Optimal Massive Gas Injection Conditions for Oil Recovery Enhancement by Diffusion in Fractured and Heterogeneous Reservoirs", Joule programme, Contract no. JOF3-CT95-0008
Activities; Theoretical and numerical study of enhanced oil recovery by gas injection in fractured reservoirs using pore-network modeling

1. "Experimental Study of oil recovery potential from backed bead cells saturated with volatile hydrocarbons", Research Grant by the Embirikion Foundation (2000-2002) (Scientist in charge: Prof. A. Boudouvis, NTUA, Greece)
Activities; Experimental study of drying curves and interface dynamics during the isothermal evaporation of volatile hydrocarbons in glass bead packings