

Marios S. Valavanides

Position: **Professor** (*Hydraulics and Flow in Porous Media*)
Department of Civil Engineering, University of West Attica
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Citizenship: Greek

Studies

- 1998 **PhD (Fluid Mechanics)**, University of Patras, Dept of Chemical Engineering, Laboratory of Physicochemical Hydrodynamics & Transport Phenomena. PhD Thesis title: "*Macroscopic Theory of Two-phase Flow in Porous Media based on Integration of Pore Scale Phenomena*". Supervisor: Prof. A.C. Payatakes. <http://thesis.ekt.gr/11044>
- 1991 **Postgraduate Specialization in Composite Materials**, University of Patras, Dept. of Mechanical & Aerospace Engineers, Lab. of Applied Mechanics. "*Damage Tolerance in Advanced, Thermoplastic Composite Aerospace Constructions*".
- 1989 **Engineering Diploma in Mechanical Engineering**, University of Patras.

Teaching

Undergraduate, UNIWA: Fluid Mechanics, Hydraulics, Experimental Hydraulics, Irrigation-Drainage, Construction Equipment. *Army Corps of Engineers*: Fluid Mechanics & Applied Hydraulics
Postgraduate, Hellenic Open Univ.: Construction Project Management

Research

A. Interests

Fluid mechanics and, in particular, physics and multi-scale modelling of two-phase flow in porous media, continuum mechanics and mechanics of composite materials. Research activities are focused on the development of the *DeProF* theory for two-phase flow in porous media. Research efforts are towards the recovery of universal, flow-rate dependent, relative permeability and energy efficiency maps for two-phase flow in porous media, the development of a normative methodology for the effective characterization of flows (capillary/viscous) and pore networks and implementation in practical applications (R/SCAL). (ImproDeProF project: <http://users.uniwa.gr/marval/ImproDeProF.html>)

B. Expeditions

ImproDeProF: "Two-Phase Flow in Porous Media: Improvement of the Mechanistic Model DeProF and Implementation in Practical Applications." Contractor: TEI Athens MIS 379389, Budget: 100,0k€, Duration 2012-2015, **Scientific Manager** M.S. Valavanides (<http://users.uniwa.gr/marval/ImproDeProF.html>)

C. International Collaborations

PML: Porous Media Lab, Inst. of Applied Mechanics, Dept. of Civil & Environmental Eng., University of Stuttgart, <https://www.mib.uni-stuttgart.de/institute/news/news/Research-visit-of-Prof.-Dr.-Marios-Valavanides/>, Visiting Researcher awarded 2 DAAD Fellowships, Res. Stays for Univ. Academics & Scientists, DAAD 57552335(2021), DAAD 57698956(2024)

PoreLab: Norwegian Center of Excellence (2017), NTNU and University of Oslo (UiO), focusing on the physics of porous media using experimental, theoretical and computational methods, ex-**International Collaborator**

Publication record (see appended PUBLICATION LIST A-D)

16 publications in international scientific journals (5 monographs, list A)
4 publications in books (list B)
17 publications in international conference proceedings (list C, selected)
>20 presentations in scientific conferences (list D, selected)
Citations / h-Index : Scopus, **242/8** google scholar, **460/11**

Invited presentations (9)

- Valavanides, M.S. 2022 "Flow Dependent Relative Permeability Scaling for Steady-State Two-Phase Flow in Porous Media: Laboratory Validation on a Microfluidic Network" SFB1313 Pretty Porous Science Lecture #18, University of Stuttgart, April 21
- Valavanides, M.S. 2019 "The DeProF theoretical framework for two-phase flows in porous media - Energy efficiency, critical flows, flow rate dependent rel-perm scaling" Pore Scale Physics Seminar, Shell Technology Center Amsterdam, Amsterdam, NL, Nov. 29.
- Valavanides, M.S. 2019 "A new theoretical framework for two-phase flow in porous media – Recent advances and perspectives" SFB1313 guest Lecture, Univ. Stuttgart, Germany, Nov. 26.
- Valavanides, M.S. 2019 "Recent advances in the DeProF theoretical framework for two-phase flows in porous media - Where we stand and where we could go" invited PoreLab group lecture, NTNU, Trondheim, Norway, Febr. 2019.
- Valavanides, M.S. 2018 "Recent advances and new challenges in the development of the DeProF tentative theory on steady-state, two-phase flow in porous media" invited lecture, Dept. of Fundamental Physics, Faculty of Physics, University Barcelona, Spain, May 14-17
- Valavanides M.S. 2016 "Recent advances and new challenges in the development of the DeProF tentative theory on steady-state, two-phase flow in porous media." Utrecht University, Faculty of Geosciences, Dept. of Earth Sciences, Utrecht, NL, Oct. 17-20
- Valavanides, M.S. 2016 "Multi-phase flows in porous media: Recent advances and new challenges in the development of the DeProF theory for steady-state flow" Colloquium invited lecture, Institutt for Fysikk, NTNU, Trondheim, Norway, March 18
- Valavanides, M.S. 2014 "Recent Advances and New Challenges in the DeProF Theory for Steady-State Two-Phase Flow in Porous Media" Shell Amsterdam Centennial Conference "Rock & Fluid Physics: Academic and Industrial Perspectives" Amsterdam, NL, Sept. 15-17
- Valavanides, M.S. 2014 "Recent Advances and New Challenges in the DeProF Theory for Steady-State Two-Phase Flow in Porous Media" Invited research lecture, Environmental Engineering Department, Technical University of Crete, Chania, Greece, Dec. 18

Research expeditions, leader (1)

2012-2015 **ImproDeProF**: "Two-Phase Flow in Porous Media: Improvement of the Mechanistic Model DeProF and Implementation in Practical Applications." ARCHIMEDES III (grant contract NSRF-EDULL), Contractor: TEI Athens MIS 379389 Budget: 100,0 k€

Scientific Manager M.S. Valavanides

(<http://users.uniwa.gr/marval/ImproDeProF.html>)

Organisation of International conferences (3)

- Tsakiroglou, C., Valavanides, M.S., Vizika, O., Li, Q. "Innovative Methods for Characterization, Monitoring, and In-Situ Remediation of Contaminated Soils and" **Minisymposium MS 1.18** in 12th Intern. Conference on Porous Media & Annual Meeting, Qingdao, China, Aug.31-Sep.4, 2020, <https://events.interpore.org/event/23/page/154-minisymposia>
- Valavanides, M.S., Hansen, A., Burganos, V. N. "Simulation (lab, virtual) as a source of new knowledge" **Minisymposium MS 1.12** in 8th International Conference on Porous Media & Annual Meeting, Cincinnati, Ohio, USA, May 9-12, 2016 <https://www.interpore.org/65-event-booking/8th-international-conference-on-porous-media-annual-meeting/375-minisymposia14-2>
- Valavanides, M.S., Ioannidis, M.A., Tsakiroglou, C.D., Vizika, O. "Unconventional Modelling of Multi-Phase Flows in Porous Media" **Minisymposium MS 1.03** in 7th International Conference on Porous Media & Annual Meeting, Padova, Italy, May 18-21, 2015 https://www.interpore.org/images/conferences/15Padova/minisymposium_abstracts/MS_1_3.pdf

Participation in industrial innovation projects (7)

Management of RTD Projects (3)

- 2003-2006 - HERON (FORTH Photonics Hellas SA grant contract GSRT - HP-2) "Industrial research project for the development and certification of innovative diagnostic spectral imaging devices" Budget: 442,3 k € - Industrial research for the development of innovative diagnostic devices based on FORTH Photonics proprietary Spectral Imaging Technologies
- 2003-2005 - PRAXE B (FORTH Photonics Hellas SA grant contract GSRT - 03 PRAXE 11) "Commercialization of research results activities leading to the design, development, production and commercial exploitation of diagnostic imaging technologies, devices and systems", Budget: 2.094,4 k € - Implementation of start-up and business development plan

- 2004-2005 - SMART R&D Project (FORTH Photonics LTD contract DTI/SMART - LOT/031/428 Subcontractors: Imperial College STM and FORTH Photonics Hellas SA) "Optical Biopsy Colposcope", Budget: € 137,9 k€ - Feasibility study to assess the performance of proprietary dynamic spectral imaging technology for medical applications.

Commercialization of RTD results (4)

- 2002-2003 - FORTH Photonics. Feasibility studies on the development of new system applications of proprietary spectral imaging technologies for medical applications.
- 2000-2001 - IRC HF/FORTH. Feasibility study on the creation of the FORTH Instruments spin-off. Commercial evaluation of proprietary spectral imaging technology to biomedical diagnostics and non-destructive testing & analysis. Market research, competitive intelligence; design & implementation of start-up business plan; mediation of venture capital funding, etc.
- 1998-2001 - IRC HF/FORTH. Technology transfer consultant. Market research, evaluation of market potential and dissemination of research results.

Prizes and Awards.

- 1991-1996 post graduate scholarship, Foundation of Research and Technology Hellas / Institute of Chemical Eng. & High Temperature Processes (ICE-HT/FORTH)
- 2021 DAAD (German Academic Exchange Service) fellowship; Research Stays for Univ. Academics & Scientists, DAAD 57552335 (2021) at MIB/University of Stuttgart
- 2021 SPWLA (Soc. of Petrophysicists & Well Log Analysts) Annual Foundation Grant
- 2024 DAAD (German Academic Exchange Service) fellowship; Research Stays for Univ. Academics & Scientists, DAAD 57698956 (2024) at MIB/University of Stuttgart

Funding received so far

- 2012-2015 100,0 k€ ImproDeProF Project, <http://users.uniwa.gr/marval/ImproDeProF.html>

Supervising and mentoring activities

- 8/2016 PhD Assessment Committee Member, Dept. of Physics, NTNU, Norway
- 2005-present Supervised 39 MSc theses, Adjunct Professor, Hellenic Open University
- 2006-present Supervised 20 graduate theses at UNIWA/TEI Athens

Reviewer

Scientific Journal, Publisher (Q ranking SCIMAGO)

Energies, MDPI (Q1); *Oil & Gas Science and Technology*, Rev IFP Energies nouvelles (Q1); *Physics of Fluids* (Q1); *SPE Reservoir Evaluation & Engineering Journal*, SPE (Q1); *Transport in Porous Media*, Springer (Q1); *Water*, MDPI (Q1); *Computation*, MDPI (Q2); *Entropy*, MDPI (Q2); *Intl. J. Oil, Gas and Coal Technology*, Inderscience (Q2); *J. Hazardous, Toxic, and Radioactive Waste*, ASCE (Q2); *Materials*, MDPI (Q2); *Sustainability*, MDPI (Q2); *Water Resources Research*, AGU (Q1)

Academic evaluation committees

Member in 23 Review & Recommendation Committees; evaluation of candidacies for academic positions (Lecturer, Assistant and Associate Professors) in HEIs.

Work history

- 2018 – pres. Professor. University of West Attica (UniWA), Dept of Civil Engineering.
- 2021 – pres. Adjunct Professor. School of the Greek Army Corps of Engineers (STEAMX)
- 2006 - 2018 Assistant, then Associate Professor TEI Athens and University of West Attica, Dept of Civil Engineering.
- 2002 - 2006 Project Manager. FORTH PHOTONICS LTD & SA, a FORTH spin-off company developing innovative diagnostic imaging technologies.
- 1999 - 2002 Technology Transfer Consultant. FORTH/IRC HELP-FORWARD, and Federation of Greek Industries (FGI).
- 1997 - 1998 Research Assistant, FORTH/ ICE-HT.
- 2005 - 2021 Adjunct Professor, Hellenic Open University.

Scientific & Professional Affiliations

SPWLA - Society of Petrophysicists & Well Log Analysts (2021); CCS – Complex Systems Society (2018); SCA - Society of Core Analysts (2014); InterPore – International Society for Porous Media (2012); PM Greece - Network of Project Managers in Greece(2012); SPE - Society of Petroleum Engineers (2004); Hellenic Society of Rheology (1998); TEE - Hellenic Technical Chamber (1989)

PUBLICATIONS

A. International Scientific Journals

- A.1 Karadimitriou, N., Valavanides, M.S., Mouravas, K., Steeb, H. 2023 "Flow Dependent Relative Permeability Scaling for Steady-State, Two-Phase Flow in Porous Media: Laboratory Validation on a Microfluidic Network" *Petrophysics* **64**(5), 656:679, <https://doi.org/10.30632/PJV64N5-2023a4>, http://users.uniwa.gr/marval/publ/Karadimitriou_etal_Petrophysics2023.pdf
- A.2 Valavanides, M.S. 2023 "Flowrate Dependency of Steady-State Two-Phase Flows in Pore Networks: Universal, Relative Permeability Scaling Function and System Characteristic Invariants" *Transport In Porous Media* **150** 521:557, <https://doi.org/10.1007/s11242-023-02012-5>
- A.3 Valavanides, M.S. 2018 "Review of steady-state two-phase flow in porous media: independent variables, universal energy efficiency map, critical flow conditions, effective characterization of flow and pore network" *Transp. in Porous Media*, **123** (1),42-99, (Q1), <https://doi.org/10.1007/S11242-018-1026-1>
- A.4 Valavanides, M.S. 2018 "Oil fragmentation, interfacial surface transport and flow structure maps for two-phase flow in model pore networks. Predictions based on extensive, DeProF model simulations." *Oil & Gas Science and Technology*, **73**(6), 1:36, (Q2), <https://doi.org/10.2516/ogst/2017033>
- A.5 Kamvyssas, G., Valavanides, M.S., 2017. "Analytical Solution of the Saturated Flow Problem in 7-Spot, 2D Geometries" *Fresenius Environmental Bulletin*, **26**(9), 5523-5528, (Q3), http://uniwa.gr/marval/publ/Kamvyssas_Valavanides_FEB_26_2017.pdf
- A.6 Valavanides, M.S., Daras, T. 2016 "Definition and Counting of Configurational Microstates in Steady-State Two-Phase Flows in Pore Networks" *Entropy*, **18** (054), (Q2), <http://dx.doi.org/10.3390/e18020054>
- A.7 Valavanides, M.S., Totaj, E., Tsokopoulos, M. 2016 "Energy Efficiency Characteristics in Steady-State Relative Permeability Diagrams of Two-Phase Flows in Porous Media" *Journal of Petroleum Science and Engineering*, **147**, 181:201, (Q1) <http://dx.doi.org/10.1016/j.petrol.2016.04.039>
- A.8 Tsakiroglou, C.D., Aggelopoulos, C.A., Terzi, K., Avraam, D.G., Valavanides, M.S. 2015 "Steady-state two-phase relative permeability functions of porous media: A revisit" *Int. J. of Multiphase Flow*, **73**, 34:42, (Q1), <http://dx.doi.org/10.1016/j.ijmultiphaseflow.2015.03.001>
- A.9 Valavanides, M.S., Skouras, E.D. 2014 "Rational well spacing for soil remediation processes" *Fresenius Environmental Bulletin*, **23** (11a), 2847:2851, (Q3), http://users.uniwa.gr/marval/publ/Valavanides_Skouras_FEB_23_11_2014.pdf
- A.10 Valavanides, M.S. 2013 "Portfolios as off-equilibrium processes: similarities and affinities" *Procedia – Social and Behavioral Sciences*, **119**, 539:548, (Q n/a), <http://dx.doi.org/10.1016/j.sbspro.2014.03.060>
- A.11 Valavanides, M.S. 2012 "Steady-State Two-Phase Flow in Porous Media: Review of Progress in the Development of the DeProF Theory Bridging Pore- to Statistical Thermodynamics- Scales" *Oil & Gas Science and Technology*, **67**(5), 787:804, (Q2), <http://dx.doi.org/10.2516/ogst/2012056>
- A.12 Valavanides, M.S., Payatakes, A.C. 2001 "True-to-Mechanism Model of Steady-State Two-Phase Flow in Porous Media, using Decomposition into Prototype Flows" *Advances in Water Resources*, **24** (3-4), 385:407, (Q1), [http://dx.doi.org/10.1016/S0309-1708\(00\)00063-4](http://dx.doi.org/10.1016/S0309-1708(00)00063-4)
- A.13 Valavanides, M.S., Constantinides, G.N., Payatakes, A.C. 1998 "Mechanistic Model of Steady-State Two-Phase Flow in Porous Media Based on Ganglion Dynamics" *Transport in Porous Media* **30**, 267:299, (Q1), <http://link.springer.com/article/10.1023/A%3A1006558121674>
- A.14 Kyriaki, K., Polyzos, D., Valavanides, M. 1997 "Low-frequency scattering of coated spherical obstacles" *Journal of Engineering Mathematics*, **31**, 379:395 (Q2)
- A.15 Paipetis, S.A., Polyzos, D., Valavanidis, M. 1993 "Constitutive relations of periodic laminated composites with anisotropic dissipation" *Archive of Applied Mechanics*, **64**, 32:43, (Q1) <http://dx.doi.org/10.1007/BF00792342>, <http://link.springer.com/article/10.1007%2FBF00792342>
- A.16 Polyzos, D., Valavanidis, M., Paipetis, S.A. 1991 "Dynamic Properties of Ellipsoidal Particle Composites". *Science and Engineering of Composite Materials*, **2**(1), 11:27, (Q2), http://users.uniwa.gr/marval/publ/Polyzos_etal_SciEngCompMat_2_1991.pdf

B. Books / Articles in Books

- B.1 Valavanides, M. 2025 "*Experimental Hydraulics - Laboratory Reproduction and Analysis of Hydraulic Phenomena*" [Undergraduate textbook – in Greek]. Kallipos, Open Academic Editions, ISBN 978-618-228-282-3 <http://dx.doi.org/10.57713/kallipos-1033>
- B.2 Valavanides, M.S., Payatakes, A.C. 2002 "Comparison of Two-Phase Flow in 2-D and 3-D Pore Networks Using a True-to-Mechanism Theoretical Model (DeProF)" in S.M. Hassanizadeh et al. (Editors), *Computational Methods in Water Resources XIV*, ISBN: 0-444-50975-5 Elsevier
- B.3 Valavanides, M.S., Payatakes, A.C. 2000 "A true-to-mechanism model of steady-state two-phase flow in porous media, including the contribution of the motion of ganglia and droplets", in L.R. Bentley et al. (Editors): *Computational Methods in Water Resources XIII*, Vol. 1., 239:243, ISBN 9058091236, A. A. Balkema, Rotterdam, The Netherlands, http://users.uniwa.gr/marval/publ/Valavanides_Payatakes_CMWRXIII_2000.pdf
- B.4 Payatakes, A.C., Valavanides, M.S. 1998 "True-to-mechanism macroscopic theory of steady-state two-phase flow in porous media", in V.N. Burganos et al. (Editors): *Computational Methods in Water Resources XII*, Vol. 2, 3:10, ISBN 1-85312-653-5
- B.5 Payatakes A.C., Constantinides, G.N., Valavanides, M.S. 1998 "*Hierarchical Theoretical Models: An Informal Introduction*", in G. Dassios et al (Eds): *Mathematical Methods in Scattering Theory and Biomedical Technology*, ISBN 0582368049, Addison Wesley Longman Ltd, Pitman Research Notes in Mathematics Series, No390, 158:169, http://users.uniwa.gr/marval/publ/Payatakes_etal_PitmanRNMS_390_1998.pdf

C. Conference Proceedings

- C.1 Mouravas, K., Karadimitriou, N., Dimitriadis, P., Giotis, A., Valavanides, M.S., Steeb, H. 2025 "Flow-dependency aspects in SCAL of steady-state two-phase flow in model pore networks", *2025 Annual Symposium Society of Core Analysts*, Aug. 25-28, Hanover, Germany, http://users.uniwa.gr/marval/publ/Mouravas_etal_SCA2025-1097.pdf
- C.2 Valavanides, M.S. 2024 "Asynchronous, virtual teaching of physical experiments in hydraulics: a paradigm in practice", *I-HE2024 Innovating Higher Education Conference 2024*, Limassol, Cyprus, Oct. 23-25, 71:79, *European Association of Distance Teaching Universities (EADTU)* ISBN 9789079730506, <https://doi.org/10.5281/zenodo.14215069>
- C.3 Valavanides, M.S., Karadimitriou, N., Steeb H. 2022 "Flow Dependent Relative Permeability Scaling for Steady-State, Two-Phase Flow in Porous Media: Laboratory Validation on a Microfluidic Network", *SPWLA 63rd Annual Logging Symposium*, 0054, Stavanger, Norway, June 11-15, DOI: 10.30632/SPWLA-2022-0054, http://users.uniwa.gr/marval/publ/Valavanides_etal_2022_SPWLA63_0054c.pdf
- C.4 Valavanides, M.S., Karadimitriou, N., Steeb, H. 2022 "Interstitial Flow Instabilities During Steady-State Two-Phase Flow in Microfluidic Pore Network Models", *13th Panhellenic Scientific Conference in Chemical Engineering* PSCCE, Art. P-478, University of Patras, June, 2-4, http://users.uniwa.gr/marval/publ/Valavanides_etal_2022_PSCCE_P478.pdf
- C.5 Valavanides, M.S., Mascle, M., Youssef, S., Vizika, O. 2020 "Steady-State Two-Phase Flow in Porous Media: Laboratory Validation of Flow Dependent Relative Permeability Scaling", *E3S Web of Conferences* 146, 03002, *The International Symposium of the Society of Core Analysts, SCA2019*, <https://doi.org/10.1051/e3sconf/202014603002>
- C.6 Valavanides, M.S. 2018 "Taxonomy of Steady-State Two-Phase Flows in Porous Media", *The International Symposium of the Society of Core Analysts, SCA2018-067*, Aug. 27-30, http://users.uniwa.gr/marval/publ/Valavanides_SCA2018-067.pdf
- C.7 Valavanides, M.S. 2018 "Universal, Flow Dependent Relative Permeability Scaling for Steady-State Two-Phase Flows in Porous Media", *The International Symposium of the Soc. of Core Analysts, SCA2018-060*, Aug. 27-30, http://users.uniwa.gr/marval/publ/Valavanides_SCA2018-060.pdf
- C.8 Skouras, E.D., Kalarakis, A.N., Valavanides, M.S., Burganos, V.N. 2015 "Two-Phase Flow Calculations in Pore Unit-Cells Implementing Mixed FEM/Lattice-Boltzmann Simulators" *COMSOL 2015 Conference*, Grenoble, France, Oct. 14-16, http://users.uniwa.gr/marval/publ/Skouras_etal_FEMLB_COMSOL2015.pdf
- C.9 Valavanides, M.S., Skouras, E.D., Kalarakis, A.N., Burganos, V.N. 2015 "Integration of Flow Dependent Relative Permeability Maps for Two-Phase Flow in Porous Media into the COMSOL Multiphysics™ Earth Science Module" *COMSOL 2015 Conference*, Grenoble, France, Oct. 14-16 http://users.uniwa.gr/marval/publ/Valavanides_etal_COMSOL2015.pdf
- C.10 Valavanides, M.S., Totaj, E., Tsokopoulos, M. 2015 "Retrospective examination of relative permeability data on steady-state two-phase flow in porous media", in N. Mastorakis et al. (Editors): *Proceedings of the International Conference on Mechanics, Materials, Mechanical Engineering and Chemical Engineering (MMMCE 2015)*, ISBN: 978-1-61804-295-8 Barcelona, Spain, April 7-9, http://users.uniwa.gr/marval/publ/Valavanides_etal_MMMCE2015.pdf

- C.11 Daras, T., Valavanides, M.S. 2015 "Number of Microstates and Configurational Entropy for Steady-State Two-Phase Flows in Pore Networks" *AIP Conf. Proc.* **1641**, 147:154, <http://dx.doi.org/10.1063/1.4905973>
- C.12 Valavanides, M.S. 2014 "Operational Efficiency Map and Flow Characterization for Steady-State Two-Phase Flows in Porous Media" paper SCA2014-047, *Intern. Symposium of the Society of Core Analysts*, Avignon, France, Sept. 8-14, http://users.uniwa.gr/marval/publ/Valavanides_SCA2014-047.pdf
- C.13 Valavanides, M.S. 2010 "Optimum Operating Conditions for Two-Phase Flow in Pore Network Systems: Conceptual Justification Based on Statistical Thermodynamics" [SPE-135429](#), 2010 *SPE Annual Technical Conference & Exhibition*, Florence, Italy, Sept. 19-22, http://users.uniwa.gr/marval/publ/Valavanides_SPE135429_2010.pdf
- C.14 Valavanides, M.S., Payatakes, A.C. 2004 "Wetting Film Effects on Steady-State Two-Phase Flow in Pore Networks using the DeProF Theoretical Model" [SPE-88713](#), 11th *ADIPEC Abu Dhabi International Petroleum Exhibition & Conference*, Abu Dhabi, United Arab Emirates, Oct. 10-13, 1:10, http://users.uniwa.gr/marval/publ/Valavanides_Payatakes_SPE88713_2004.pdf
- C.15 Valavanides, M.S., Payatakes, A.C. 2003 "Prediction of Optimum Operating Conditions for Steady-State Two-Phase Flow in Pore Network Systems Using the DeProF True-to-Mechanism Theoretical Model", paper SCA203-18, *Intern. Symposium of the Society of Core Analysts*, Pau, France, Sept. 21-25, http://users.uniwa.gr/marval/publ/Valavanides_Payatakes_SCA2003_18_2003.pdf
- C.16 Valavanides, M.S., Payatakes, A.C. 2002 "Effects of Pore Network Characteristics on Steady-State Two-Phase Flow Based on a True-to-Mechanism Model (DeProF)" [SPE-78516](#), 10th *ADIPEC Abu Dhabi International Petroleum Exhibition & Conference*, Abu Dhabi, United Arab Emirates, October 13-16, 379:387, http://users.uniwa.gr/marval/publ/Valavanides_Payatakes_SPE78516_2002.pdf
- C.17 Valavanides, M.S., Payatakes, A.C. 1998 "Prediction of the relative permeabilities for steady-state two-phase flow in porous media, using a mechanistic-thermodynamic model", *ECMOR VI 6th European Conference on the Mathematics of Oil Recovery*, Peebles - Scotland, Sept. 8-11. <https://doi.org/10.3997/2214-4609.201406619>.
- C.18 Valavanides, M. S., Constantinides, G. N., Payatakes, A. C. 1996 "Simulation of the Motion of Oil Ganglia in Consolidated Porous Media. Crowding Effects", *ECMOR V, Proc. 5th European Conference on the Mathematics of Oil Recovery*, Sep 1996, Leoben, Austria, cp-101-00032, ISBN: 3-9500542-0-0, <https://doi.org/10.3997/2214-4609.201406893>

D. Conference Presentations (oral, poster) - indicative, not extensive list

- D.1 Morfopoulos, A., Valavanides, M.S. 2019 "Correlations between cross-over and critical-flow conditions for steady-state, two-phase flows in porous media - Do they exist?" P978, *InterPore2019, 11th International Conference on Porous Media*, Valencia, Spain, May 6-10
- D.2 Valavanides, M.S. 2018 "A multi-scale, inherently complex self-organizing process: Steady-State Two-Phase Flow in Pore Networks" *CCS2018, 5th International Conference of the Complex Systems Society*, Thessaloniki, Greece, Sept. 23-28
- D.3 Valavanides, M.S. 2017 "Steady-state two-phase flow in porous media: independent variables, critical flow conditions, universal energy efficiency map and effective, flow and system characterization." *PoreLab Group Kick-off Meeting*, Oslo, Norway, Sept. 2017
- D.4 Skouras, E.D., Kalarakis, A.N., Valavanides, M.S., Burganos, V.N. 2015 "A Model for Spatiotemporal Varying Mass Transfer Problems During Two-Phase Flow Within Pore Networks, Based on the DeProF Model Description of the Flow Patterns" MS 1.03 P 2.055 *InterPore2015, 7th International Conference on Porous Media*, Padova, May 21-24
- D.5 Valavanides, M.S. 2012 "From Pore to Network to DeProF to aSaPP: Development of a Complete Theory for Steady-State Two Phase Flow in Porous Media, Spanning Pore- to Statistical Thermodynamics-Scales", *Gordon Research Conference on 'Flow and Transport in Porous Media'*, Les Diablerets, Switzerland, June 24-29.
- D.6 Payatakes, A.C., Valavanides, M.S. 1998 "True-to-Mechanism Macroscopic Theory of Steady-State Two-Phase Flow in Porous Media (Decomposition into Prototype Flow: DeProF)" *Gordon Research Conference on 'Modeling of Flow in Permeable Media'*, Plymouth State College, New Hampshire, USA, Aug.3-7. Gordon Research Media, Andover N.H., USA, Aug. 2-7.
- D.7 Payatakes, A.C., Avraam, D.G., Constantinides, G.N. Valavanides, M.S. 1996 "Flow Regimes and Relative Permeabilities During Steady-State Two-Phase Flow in Porous Media" 7th *Intern. Symposium Oil Field Chemicals*, Geilo, Norway, March 17-20
- D.8 Payatakes, A.C., Avraam, D.G., Valavanides, M.S. Constantinides, G.N. 1992 "Prediction of Transient and Steady-State Relative Permeabilities Based on the Experimental and Theoretical Analysis of 2-ph Flow in Porous Media" *Gordon Research Conference on "Modelling of Flow in Permeable Media"* New Hampshire, Aug. 10-14.