# **Marios S. Valavanides**

Position:	<b>Professor</b> (Hydraulics of	and Flow in Porous Media)	
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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: "<u>Macroscopic</u> <u>Theory of Two-phase Flow in Porous Media based on Integration of Pore Scale Phenomena</u>". Supervisor: Prof. A.C. Payatakes. <u>http://thesis.ekt.gr/11044</u>
- 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. <u>Interests</u>

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: <a href="http://users.uniwa.gr/marval/ImproDeProF.html">http://users.uniwa.gr/marval/ImproDeProF.html</a>)

#### 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, <u>https://www.mib.uni-stuttgart.de/institute/news/news/Research-visit-of-Prof.-Dr.-Marios-Valavanides/</u>, 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 prospectives" 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 12<sup>th</sup> Intern. Conference on Porous Media& Annual Meeting, Qingdao, China, Aug.31-Sep.4, 2020, https://events.interpore.org/event/23/page/154-minisymposia
- <u>Valavanides, M.S.</u>, Hansen, A., Burganos, V. N. "Simulation (lab, virtual) as a source of new knowledge" Minisymposium MS 1.12 in 8<sup>th</sup> International Conference on Porous Media& Annual Meeting, Cincinnati, Ohio, USA, May 9-12, 2016 <u>https://www.interpore.org/65-event-booking/8th-international-conference-on-porous-media-annual-meeting/375-minisymposia14-2</u>
- <u>Valavanides, M.S.</u>, Ioannidis, M.A., Tsakiroglou, C.D., Vizika, O. "Unconventional Modelling of Multi-Phase Flows in Porous Media" Minisymposium MS 1.03 in 7<sup>th</sup> International Conference on Porous Media & Annual Meeting, Padova, Italy, May 18-21, 2015 https://www.interpore.org/images/conferences/15Padova/minisymp\_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 nondestructive 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)

#### **PUBLICATION LIST**

#### A. International Scientific Journals

- A.1 Karadimitriou, N., <u>Valavanides, M.S.</u>, 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, <u>https://doi.org/10.30632/PJV64N5-2023a4</u>, 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, <u>https://doi.org/10.1007/s11242-023-02012-5</u>
- 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), <u>https://doi.org/10.1007/S11242-018-1026-1</u>
- A.4 Valavanides, M.S. 2018 "Oil fragmentation, interfacial surface transport and flow structure maps for twophase flow in model pore networks. Predictions based on extensive, DeProF model simulations." *Oil & Gas Science and Technology*, **73**(6), 1:36, (Q2), <u>https://doi.org/10.2516/ogst/2017033</u>
- A.5 <u>Kamvyssas, G.</u>, Valavanides, M.S., 2017. "Analytical Solution of the Saturated Flow Problem in 7-Spot, 2D Geometries" *Fresenius Environmental Bulletin*, **26**(9), 5523-5528, (Q3), <u>http://uniwa.gr/marval/publ/Kamvyssas\_Valavanides\_FEB\_26\_2017.pdf</u>
- A.6 <u>Valavanides, M.S.</u>, Daras, T. 2016 "Definition and Counting of Configurational Microstates in Steady-State Two-Phase Flows in Pore Networks" *Entropy*, **18** (054), (Q2), <u>http://dx.doi.org/10.3390/e18020054</u>
- A.7 <u>Valavanides, M.S.</u>, 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) <u>http://dx.doi.org/10.1016/j.petrol.2016.04.039</u>
- A.8 <u>Tsakiroglou, C.D.</u>, Aggelopoulos, C.A., Terzi, K., Avraam, D.G., Valavanides, M.S. 2015 "Steady-state twophase relative permeability functions of porous media: A revisit" *Int. J. of Multiphase Flow*, **73**, 34:42, (Q1),<u>http://dx.doi.org/10.1016/j.ijmultiphaseflow.2015.03.001</u>
- A.9 <u>Valavanides, M.S.</u>, 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), <u>http://dx.doi.org/10.1016/j.sbspro.2014.03.060</u>
- 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), <u>http://dx.doi.org/10.2516/ogst/2012056</u>
- A.12 Valavanides, M.S., <u>Payatakes, A.C.</u> 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), <u>http://dx.doi.org/10.1016/S0309-1708(00)00063-4</u>
- A.13 Valavanides, M.S., Constantinides, G.N., <u>Payatakes, A.C.</u> 1998 "Mechanistic Model of Steady-State Two-Phase Flow in Porous Media Based on Ganglion Dynamics" *Transport in Porous Media* **30**, 267:299, (Q1), <u>http://link.springer.com/article/10.1023/A%3A1006558121674</u>
- A.14 <u>Kyriaki, K.</u>, 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., <u>Polyzos, D.</u>, Valavanidis, M. 1993 "Constitutive relations of periodic laminated composites with anisotropic dissipation" *Archive of Applied Mechanics*, **64**, 32:43, (Q1) <u>http://dx.doi.org/10.1007/BF00792342</u>, <u>http://link.springer.com/article/10.1007%2FBF00792342</u>
- A.16 Polyzos, D., Valavanidis, M., <u>Paipetis, S.A.</u> 1991 "Dynamic Properties of Ellipsoidal Particle Composites". *Science and Engineering of Composite Materials*, **2**(1), 11:27, (Q2), <u>http://users.uniwa.gr/marval/publ/Polyzos etal SciEngCompMat 2 1991.pdf</u>
- B. Articles in Books

- B.1 Valavanides, M.S., <u>Payatakes, A.C.</u> 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.2 Valavanides, M.S., <u>Payatakes, A.C.</u> 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, <a href="http://users.uniwa.gr/marval/publ/Valavanides Payatakes CMWRXIII">http://users.uniwa.gr/marval/publ/Valavanides Payatakes CMWRXIII</a> 2000.pdf
- B.3 <u>Payatakes, A.C.</u>, Valavanides, M.S. 1998 "True-to-mechanism macroscopic theory of steady-state twophase 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.4 <u>Payatakes A.C.</u>, Constantinides, G.N., Valavanides, M.S. 1998 "<u>Hierarchical Theoretical Models: An</u> <u>Informal Introduction</u>", 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) "Flowdependency 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, https://doi.org/10.5281/zenodo.14215069
- C.3 <u>Valavanides, M.S.</u>, 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, <u>http://users.uniwa.gr/marval/publ/Valavanides\_etal\_2022\_SPWLA63\_0054c.pdf</u>
- C.4 <u>Valavanides, M.S.</u>, Karadimitriou, N., Steeb, H. 2022 "Interstitial Flow Instabilities During Steady-State Two-Phase Flow in Microfluidic Pore Network Models", *13<sup>th</sup> 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 PSXM13 P478.pdf
- C.5 <u>Valavanides, M.S.</u>, 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, <u>http://users.uniwa.gr/marval/publ/Valavanides\_SCA2018-067.pdf</u>
- 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 <u>Skouras, E.D.</u>, 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, <u>http://users.uniwa.gr/marval/publ/Skouras\_etal\_FEMLB\_COMSOL2015.pdf</u>
- C.9 <u>Valavanides, M.S.</u>, 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<sup>™</sup> Earth Science Module" COMSOL 2015 Conference, Grenoble, France, Oct. 14-16 <u>http://users.uniwa.gr/marval/publ/Valavanides\_etal\_COMSOL2015.pdf</u>
- C.10 <u>Valavanides, M.S.</u>, 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., <u>Valavanides, M.S.</u> 2015 "Number of Microstates and Configurational Entropy for Steady-State Two-Phase Flows in Pore Networks" *AIP Conf. Proc.***1641**, 147:154, <u>http://dx.doi.org/10.1063/1.4905973</u>

- 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, <u>http://users.uniwa.gr/marval/publ/Valavanides\_SCA2014-047.pdf</u>
- C.13 Valavanides, M.S. 2010 "Optimum Operating Conditions for Two-Phase Flow in Pore Network Systems: Conceptual Justification Based on Statistical Thermodynamics" <u>SPE-135429</u>, 2010 SPE Annual Technical Conference & Exhibition, Florence, Italy, Sept. 19-22, http://users.uniwa.gr/marval/publ/Valavanides SPE135429 2010.pdf
- C.14 <u>Valavanides, M.S.</u>, Payatakes, A.C. 2004 "Wetting Film Effects on Steady-State Two-Phase Flow in Pore Networks using the *DeProF* Theoretical Model" <u>SPE-88713</u>, 11<sup>th</sup> 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 <u>Valavanides, M.S.</u>, 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, <u>http://users.uniwa.gr/marval/publ/Valavanides Payatakes SCA2003 18 2003.pdf</u>
- C.16 <u>Valavanides, M.S.</u>, Payatakes, A.C. 2002 "Effects of Pore Network Characteristics on Steady-State Two-Phase Flow Based on a True-to-Mechanism Model (*DeProF*)" <u>SPE-78516</u>, 10<sup>th</sup> ADIPEC Abu Dhabi International Petroleum Exhibition & Conference, Abu Dhabi, United Arab Emirates, October 13-16, 379:387, <u>http://users.uniwa.gr/marval/publ/Valavanides\_Payatakes\_SPE78516\_2002.pdf</u>
- C.17 Valavanides, M.S., <u>Payatakes, A.C.</u> 1998 "Prediction of the relative permeabilities for steady-state twophase flow in porous media, using a mechanistic-thermodynamic model", *ECMOR VI 6<sup>th</sup> European Conference on the Mathematics of Oil Recovery,* Peebles - Scotland, Sept. 8-11. <u>https://doi.org/10.3997/2214-</u> 4609.201406619,
- C.18 Valavanides, M. S., Constantinides, G. N., <u>Payatakes, A. C.</u> 1996 "Simulation of the Motion of Oil Ganglia in Consolidated Porous Media. Crowding Effects", ECMOR V, Proc. 5<sup>th</sup> European Conference on the Mathematics of Oil Recovery, Sep 1996, Leoben, Austria, cp-101-00032, ISBN: 3-9500542-0-0, <u>https://doi.org/10.3997/2214-4609.201406893</u>

#### 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, 11<sup>th</sup> 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*, 5<sup>th</sup> 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 <u>Skouras, E.D.</u>, Kalarakis, A.N., Valavanides, M.S., Burganos, V.N. 2015 "A Model for Spatiotemporary 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*, 7<sup>th</sup> *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 <u>Payatakes, A.C.</u>, 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 Hamshire, USA, Aug.3-7. Gordon Research Media, Andover N.H., USA, Aug. 2-7.
- D.7 <u>Payatakes, A.C.</u>, Avraam, D.G.,Constantinides, G.N. Valavanides, M.S. 1996 "Flow Regimes and Relative Permeabilities During Steady-State Two-Phase Flow in Porous Media" 7<sup>th</sup> Intern. Symposium Oil Field Chemicals, Geilo, Norway, March 17-20
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