

# Marios S. Valavanides

Position: Associate Professor  
Department of Civil Engineering, University of West Attica  
Campus 1, Ag. Spyridonos, GR-12210 Athens, Greece,  
+30 210 5387205 & +30 697 4090258  
[marval@uniwa.gr](mailto:marval@uniwa.gr) [http://users.uniwa.gr/marval/index\\_en.html](http://users.uniwa.gr/marval/index_en.html)

Citizenship: Greek

Other Position: Adjunct Assoc. Professor (since 2005), Hellenic Open University (HOU), School of Science and Technology, Faculty of Construction Eng. Management (MSc)

## 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 **Eng. Diploma in Mechanical Engineering**, University of Patras.

## Teaching activities

Undergraduate, TEI A: Fluid Mechanics, Applied Hydraulics, Irrigation, Construction Equipment  
Postgraduate, Hellenic Open Univ.: Construction Project Management

## Research activities

### 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 the universal, 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. (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

**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 ([www.porelab.no](http://www.porelab.no)), **International Collaborator** (<https://porelab.no/international-collaborators/>)

## 1. Publication record (see appended PUBLICATION LIST W, A-D)

6 working papers (list W)  
15 publications in international scientific journals (4 monographs, list A)  
5 publications in books (list B)  
15 publications in international conference proceedings (list C)  
> 20 presentations in scientific conferences (list D, selected)  
Citations / h-Index : scopus, **158/6** google scholar, **325/8**

## 2. Invited presentations (5)

- 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 of Barcelona, 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 Norges Teknisk-Naturv. Univ. (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
- 3. Research expeditions, leader (1)**  
 2012-2015 ARCHIMEDES III (grant contract NSRF-EDULL)  
 Contractor: TEI Athens MIS 379389 Budget: 100,0 k€,  
**ImproDeProF:** “Two-Phase Flow in Porous Media: Improvement of the Mechanistic Model DeProF and Implementation in Practical Applications.”  
 Scientific Manager M.S. Valavanides (<http://users.uniwa.gr/marval/ImproDeProF.html>)
- 4. Organisation of International conferences (2)**
- Valavanides, M.S., 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 <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 Modeling 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](https://www.interpore.org/images/conferences/15Padova/minisymp_abstracts/MS_1_3.pdf)
- 5. 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 in detecting & identifying non-invasively cervical abnormalities including cervical neoplasias and cancer.

#### Commercialization of RTD results (4)

- 2002-2003 FORTH Photonics. Feasibility studies on the development of new system applications of proprietary spectral imaging technologies.
- 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 and competitive intelligence; design & implementation of start-up business plan; mediation of venture capital funding, etc.
- 2000-2001 IRC HF/FORTH. Feasibility study to attract strategic partners for a joint venture with the QNC UNIFORM (Quasi Natural Consolidation of unconsolidated or poorly consolidated oil Formations) technology developers, ICE-HT/FORTH and NTNU
- 1998-2000 IRC HF/FORTH Technology transfer consultant. Market research, evaluation of market potential and dissemination of research results.

#### **6. Prizes and Awards.**

1991-1996 post graduate scholarship, Foundation of Research and Technology Hellas / Institute of Chemical Eng. & High Temperature Processes (ICE-HT/FORTH)

#### **7. Funding received so far**

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

#### **8. 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 18 graduate theses at TEI Athens

#### **9. Reviewer**

*Scientific Journal*, Publisher (Q ranking SCIMAGO)

*Materials*, MDPI (Q2), *Energies*, MDPI (Q1); *Computation*, MDPI; *Sustainability*, MDPI (Q2); *Transport in Porous Media*, Springer (Q1); *Entropy*, MDPI (Q2); *Intl. Journal of Oil, Gas and Coal Technology*, Inderscience (Q2); *SPE Reservoir Evaluation & Engineering Journal*, SPE (Q1)  
*Other*

- Federation of Greek Industries (FGI), appointed Referee at national committees, evaluations of grants applications for industrial RTD projects (2001-2002).
- IPMA, International Project Management Association, Assessor for IPMA Project Excellence Award Applications (2012)

#### **10. Academic evaluation committees**

Member in 13 Elective and 5 Recommendation Committees; evaluation of candidacies for academic positions (Lecturer, Assistant Professor) in Technological Educational Institutes.

#### **Work history**

##### Full time positions:

2015 - present Associate Professor. TEI Athens, Civil, Survey & GIS Eng. Dept.

2006 - 2015 Assistant Professor. TEI Athens, Civil Infrastructure Engineering Department.

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.

1991 - 1997 Post graduate student, FORTH/ ICE-HT.

##### Part-time (on contract) positions:

2005 - present Adjunct Professor, Hellenic Open University.

2003 - 2006 Adjunct Professor, TEI Athens.

1998 Scientific Collaborator /Lecturer, TEI Patras.

## Scientific & Professional Affiliations

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); Hellenic Technical Chamber (1989)

## PUBLICATION LIST

### W. Working papers

- W.1 Valavanides, M.S., Kamvyssas, G. 2019 “Effective permeability of periodically layered sandstones based on homogenization theory” working paper, *J. of Applied Geophysics*. [http://users.uniwa.gr/marval/publ/Valavanides\\_Kamvyssas\\_JAG\\_2019.pdf](http://users.uniwa.gr/marval/publ/Valavanides_Kamvyssas_JAG_2019.pdf)
- W.2 Valavanides, M.S., Skouras, E.D. 2019 “Integration of true-to-mechanism, flow dependent relative permeability maps into FEM solvers to investigate complex, two-phase, field-scale flows in porous media”, *Transport in Porous Media*, [http://users.uniwa.gr/marval/publ/Valavanides\\_Skouras\\_TIPM\\_2019.pdf](http://users.uniwa.gr/marval/publ/Valavanides_Skouras_TIPM_2019.pdf)
- W.3 Valavanides, M.S. 2019 “Taxonomy of steady-state two-phase flows in porous media”, *Frontiers in Physics*, special issue “Physics of Porous Media” [http://users.uniwa.gr/marval/publ/Valavanides\\_FrontiersPhys\\_2019.pdf](http://users.uniwa.gr/marval/publ/Valavanides_FrontiersPhys_2019.pdf)
- W.4 Valavanides, M.S. 2019 “True to mechanism, flow dependent relative permeability scaling for steady-state 2-phase flows in porous media”, *Transport in Porous Media*, [http://users.uniwa.gr/marval/publ/Valavanides\\_TiPM\\_2019.pdf](http://users.uniwa.gr/marval/publ/Valavanides_TiPM_2019.pdf)
- W.5 Valavanides, M.S. 2018. “The Structure and Distribution of Configurational Microstates in Steady-State Two-Phase Flows in Model Pore Networks”, *Entropy*, [http://users.uniwa.gr/marval/publ/Valavanides\\_Entropy\\_2019.pdf](http://users.uniwa.gr/marval/publ/Valavanides_Entropy_2019.pdf)
- W.6 Valavanides, M.S. 2019 “Steady-State Two-Phase Flow in Pore Networks: A multi-scale, inherently complex self-organizing process”, Springer special volume “*Physics of Self-Organization*”, editor Georgy Y. Georgiev. [http://users.uniwa.gr/marval/publ/Valavanides\\_Springer\\_2019.pdf](http://users.uniwa.gr/marval/publ/Valavanides_Springer_2019.pdf)

### A. International Scientific Journals

- A.1 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), pp. 42-99, (Q1), <https://doi.org/10.1007/S11242-018-1026-1>
- A.2 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 – Rev IFP Energies nouvelles* **73** (6), pp. 1-36, (Q2), <https://doi.org/10.2516/ogst/2017033>
- A.3 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](http://uniwa.gr/marval/publ/Kamvyssas_Valavanides_FEB_26_2017.pdf)
- A.4 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.5 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.6 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.7 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](http://users.uniwa.gr/marval/publ/Valavanides_Skouras_FEB_23_11_2014.pdf)
- A.8 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.9 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.10 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.11 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.12 Kyriaki, K., Polyzos, D., Valavanides, M. 1997 "Low-frequency scattering of coated spherical obstacles" *Journal of Engineering Mathematics*, **31**, 379:395 (Q2)
- A.13 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.14 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](http://users.uniwa.gr/marval/publ/Polyzos_etal_SciEngCompMat_2_1991.pdf)

#### B. Articles in Books

- B.1 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.2 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](http://users.uniwa.gr/marval/publ/Valavanides_Payatakes_CMWRXIII_2000.pdf)
- B.3 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.4 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](http://users.uniwa.gr/marval/publ/Payatakes_etal_PitmanRNMS_390_1998.pdf)

#### C. Conference Proceedings

- C.1 Valavanides, M.S. 2018 "The taxonomy of steady-state two-phase flows in porous media", [http://users.uniwa.gr/marval/publ/Valavanides\\_SCA2018\\_123.pdf](http://users.uniwa.gr/marval/publ/Valavanides_SCA2018_123.pdf)
- C.2 Valavanides, M.S. 2018 "True to mechanism, flow dependent relative permeability scaling for steady-state two-phase flows in porous media", [http://users.uniwa.gr/marval/publ/Valavanides\\_SCA2018\\_066.pdf](http://users.uniwa.gr/marval/publ/Valavanides_SCA2018_066.pdf)
- C.3 Valavanides, M.S. 2015 "ImProDeProF Project: Recent Advances and New Challenges in the development of the DeProF tentative theory for steady-state two-phase flow in porous media" SCinTE 2015, Athens, Nov. 5-7, [http://users.uniwa.gr/marval/publ/Valavanides\\_SCinTE\\_2015.pdf](http://users.uniwa.gr/marval/publ/Valavanides_SCinTE_2015.pdf)
- C.4 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, Oct. 14-16, [http://users.uniwa.gr/marval/publ/Skouras\\_etal\\_FEMLB\\_COMSOL2015.pdf](http://users.uniwa.gr/marval/publ/Skouras_etal_FEMLB_COMSOL2015.pdf)
- C.5 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, Oct. 14-16 [http://users.uniwa.gr/marval/publ/Valavanides\\_etal\\_COMSOL2015.pdf](http://users.uniwa.gr/marval/publ/Valavanides_etal_COMSOL2015.pdf)
- C.6 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](http://users.uniwa.gr/marval/publ/Valavanides_etal_MMMCE2015.pdf)
- C.7 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.8 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](http://users.uniwa.gr/marval/publ/Valavanides_SCA2014-047.pdf)
- C.9 Valavanides, M.S., Kamvyssas, G. 2013 "Operational Efficiency Map of Steady-State Two-Phase Flow in Porous Media Processes" *InterPore2013, 5<sup>th</sup> International Conference on Porous Media and Annual Meeting*, Prague, May 21-24

- C.10 Valavanides, M.S. 2011 "Implementation of the *DeProF* Theory for Steady-State Two-Phase Flow in Porous Media to Improve Mass Transfer Around Rectilinear Sinks/Sources" 7<sup>th</sup> GRACM International Congress on Computational Mechanics, Athens, 30 June – 2 July 2011
- C.11 Valavanides, M.S. 2011 "From Pore to Network to *DeProF* to *aSaPP*: Towards a complete description of steady-state two-phase flow in porous media, spanning pore- to statistical thermodynamics- scales" 7<sup>th</sup> GRACM International Congress on Computational Mechanics, Athens, 30 June – 2 July 2011
- C.12 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](http://users.uniwa.gr/marval/publ/Valavanides_SPE135429_2010.pdf)
- C.13 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](#), 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](http://users.uniwa.gr/marval/publ/Valavanides_Payatakes_SPE88713_2004.pdf)
- C.14 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](http://users.uniwa.gr/marval/publ/Valavanides_Payatakes_SCA2003_18_2003.pdf)
- C.15 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](#), 10<sup>th</sup> 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](http://users.uniwa.gr/marval/publ/Valavanides_Payatakes_SPE78516_2002.pdf)
- C.16 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 6<sup>th</sup> European Conference on the Mathematics of Oil Recovery, Peebles - Scotland, Sept. 8-11.
- C.17 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. 5<sup>th</sup> European Conference on the Mathematics of Oil Recovery, Leoben, Austria, pp. 355-364. ISBN:3-9500542-0-0 / 3950054200 Edited by Z.E. Heinemann, Mining University Leoben, Austria

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

- D.1 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.2 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.3 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*, 7<sup>th</sup> International Conference on Porous Media, Padova, May 21-24
- D.4 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.5 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.6 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" 7<sup>th</sup> Intern. Symposium Oil Field Chemicals, Geilo, Norway, March 17-20
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