

## Publications by Marios S. VALAVANIDES

(*corresponding author*)

### W. Working papers

- W.1 Valavanides, M.S., Kamvyssas, G., Zarikos, I. 2019 “Effective, absolute permeability of periodically layered sandstones based on homogenization theory”, *Journal of Applied Geophysics*, [http://users.uniwa.gr/marval/publ/Valavanides\\_etal\\_JAppGeoph\\_2020.pdf](http://users.uniwa.gr/marval/publ/Valavanides_etal_JAppGeoph_2020.pdf)

### 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](http://users.uniwa.gr/marval/publ/Karadimitriou_etal_Petrophysics2023.pdf)
- A.2 Valavanides, M.S. 2022 “Flowrate Dependency of Steady-State Two-Phase Flows in Pore Networks: Universal, Relative Permeability Scaling Function and System Characteristic Invariants” *Transport In Porous Media*, on-line publ. <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” *Transport in Porous Media* **123**(1), pp. 42-99, <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 – Rev IFP Energies nouvelles* **73**(6), pp. 1-36, <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), pp. 5523-5528, [http://users.uniwa.gr/marval/publ/Kamvyssas\\_Valavanides\\_FEB\\_26\\_2017.pdf](http://users.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), pp. 1-28, <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**, pp. 181-201, <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" *International Journal of Multiphase Flow* **73** pp. 34-42, <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), pp. 2847-2851, [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.10 Valavanides, M.S. 2014 “Portfolios as off-equilibrium processes: similarities and affinities” *Procedia – Social and Behavioral Sciences* **119** pp. 539-548, <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), pp.787-804, <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), pp. 385-407, [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**, pp.267-299, <http://dx.doi.org/10.1023/A:1006558121674>
- A.14 Kyriaki, K., Polyzos, D., Valavanides, M. 1997 “Low-frequency scattering of coated spherical obstacles” *Journal of Engineering Mathematics* **31**, pp. 379-395, <http://dx.doi.org/10.1023/A:1004242312322>
- A.15 Paipetis, S.A., Polyzos, D., Valavanidis, M. 1993 “Constitutive relations of periodic laminated composites with anisotropic dissipation” *Archive of Applied Mechanics*, **64**, pp 32-43, <http://dx.doi.org/10.1007/BF00792342>
- A.16 Polyzos, D., Valavanidis, M., Paipetis, S.A. 1991 “Dynamic Properties of Ellipsoidal Particle Composites” *Science and Engineering of Composite Materials* **2**(1), pp. 11-27, <https://doi.org/10.1515/SECM.1991.2.1.11>,

## 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 (CMWR 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. pp. 239-243, ISBN 9058091236, A.A Balkema, 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, pp. 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* (Editors): “Mathematical Methods in Scattering Theory and Biomedical Technology”, ISBN 0582368049, Addison Wesley Longman Ltd, *Pitman Research Notes in Mathematics Series*, No 390, pp. 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. Organization of Symposia

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*, 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*, Padova, Italy, May 18-21, [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)

### D. Conference Proceedings

#### International Conferences:

- D.1. 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>
- D.2. Valavanides, M.S., M.S., 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\\_PSCCE\\_P478.pdf](http://users.uniwa.gr/marval/publ/Valavanides_etal_2022_PSCCE_P478.pdf)
- D.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 63<sup>rd</sup> Annual Logging Symposium*, 0054, Stavanger, Norway, Jun 11-15, DOI: 10.30632/SPWLA-2022-0054, [http://users.uniwa.gr/marval/publ/Valavanides\\_etal\\_2022\\_SPWLA63\\_0054c.pdf](http://users.uniwa.gr/marval/publ/Valavanides_etal_2022_SPWLA63_0054c.pdf)
- D.4. 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”, *The International Symposium of the Society of Core Analysts SCA2019, E3S Web of Conferences* **146**, 03002, <https://doi.org/10.1051/e3sconf/202014603002>
- D.5. Valavanides, M.S. 2018 “True to mechanism, flow dependent relative permeability scaling for steady-state 2-phase flows in porous media”, paper SCA2019-066, *Society of Core Analysts Symposium - SCA2018*, Trondheim, Norway, Aug. 27-30, [http://users.uniwa.gr/marval/publ/Valavanides\\_SCA2018\\_066.pdf](http://users.uniwa.gr/marval/publ/Valavanides_SCA2018_066.pdf)
- D.6. Valavanides, M.S. 2018 “The taxonomy of steady-state two-phase flows in porous media”, paper SCA2019-123, *Society of Core Analysts Symposium - SCA2018, Trondheim, Norway, Aug. 27-30*, [http://users.uniwa.gr/marval/publ/Valavanides\\_SCA2018\\_123.pdf](http://users.uniwa.gr/marval/publ/Valavanides_SCA2018_123.pdf)
- D.7. Valavanides, M.S. 2016 “Oil fragmentation, interfacial surface transport and flow structure maps for two-phase flow in porous media” paper 34 *Dynamics of Evolving Fluid Interfaces 2016*, Lyon, France, Oct. 12-13, [http://users.uniwa.gr/marval/publ/Valavanides\\_DEFI\\_2016\\_abstr.pdf](http://users.uniwa.gr/marval/publ/Valavanides_DEFI_2016_abstr.pdf)
- D.8. 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)

- D.9. 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)
- D.10. 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)
- D.11. Valavanides, M.S., Totaj, E., Tsokopoulos, M. 2015 "Retrospective examination of relative permeability data on steady-state two-phase flow in porous media" *INASE 2015 conferences - Mechanics, Materials, Mechanical & Chemical Engineering*, Barcelona, Spain, April 7-9, <http://www.inase.org/library/2015/books/bypaper/MMMCE/MMMCE-17.pdf> , [http://users.uniwa.gr/marval/publ/Valavanides\\_etal\\_MMMCE2015.pdf](http://users.uniwa.gr/marval/publ/Valavanides_etal_MMMCE2015.pdf)
- D.12. 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** pp. 147-154, <http://dx.doi.org/10.1063/1.4905973>,
- D.13. Valavanides, M.S. 2014 "Operational Efficiency Map and Flow Characterization for Steady-State Two-Phase Flows in Porous Media" paper SCA2014-047, *Society of Core Analysts Symposium - SCA2014*, 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)
- D.14. Tsakiroglou, C., Aggelopoulos, C.A., Terzi, K., Avraam, D.G., Valavanides, M.S. 2014 "Explicit correlation of the steady-state two-phase relative permeability functions of porous media with the local flow rates" paper SCA2014-041, *Society of Core Analysts Symposium - SCA2014*, Avignon, France, Sept. 8-14, [http://users.uniwa.gr/marval/publ/Tsakiroglou\\_etal\\_SCA2014-041.pdf](http://users.uniwa.gr/marval/publ/Tsakiroglou_etal_SCA2014-041.pdf) , [http://www.scaweb.org/assets/papers/2014\\_papers/SCA2014-041.pdf](http://www.scaweb.org/assets/papers/2014_papers/SCA2014-041.pdf)
- D.15. 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*, Prague, 21-24 May, [http://users.uniwa.gr/marval/publ/Valavanides\\_Kamvyssas\\_InterPore5\\_2013.pdf](http://users.uniwa.gr/marval/publ/Valavanides_Kamvyssas_InterPore5_2013.pdf)
- D.16. 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" paper 81, *7<sup>th</sup> GRACM International Congress on Computational Mechanics*, Athens, 30 June – 2 July 2011, [http://users.uniwa.gr/marval/publ/Valavanides\\_GRACM7\\_81\\_2011.pdf](http://users.uniwa.gr/marval/publ/Valavanides_GRACM7_81_2011.pdf)
- D.17. 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" paper 80, *7<sup>th</sup> GRACM International Congress on Computational Mechanics*, Athens, 30 June – 2 July 2011, [http://users.uniwa.gr/marval/publ/Valavanides\\_GRACM7\\_80\\_2011.pdf](http://users.uniwa.gr/marval/publ/Valavanides_GRACM7_80_2011.pdf)
- D.18. Valavanides, M.S. 2010 "Optimum Operating Conditions for Two-Phase Flow in Pore Network Systems: Conceptual Justification Based on Statistical Thermodynamics" SPE-135429-MS *2010 SPE Annual Technical Conference & Exhibition*, Florence, Italy, September 19-22, <https://doi.org/10.2118/135429-MS>, [http://users.uniwa.gr/marval/publ/Valavanides\\_SPE135429\\_2010.pdf](http://users.uniwa.gr/marval/publ/Valavanides_SPE135429_2010.pdf)
- D.19. 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-MS, 11<sup>th</sup> ADIPEC Abu Dhabi International Petroleum Exhibition & Conference, Abu Dhabi, United Arab Emirates, October 10-13, <https://doi.org/10.2118/88713-MS>, [http://users.uniwa.gr/marval/publ/Valavanides\\_SPE88173\\_2004.pdf](http://users.uniwa.gr/marval/publ/Valavanides_SPE88173_2004.pdf)

- D.20. 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”, [SCA2003-18](#), 2003 International Symposium of the Society of Core Analysts, Pau, France, 21-25 September, [http://users.uniwa.gr/marval/publ/Valavanides\\_Payatakes\\_SCA2003\\_18\\_2003.pdf](http://users.uniwa.gr/marval/publ/Valavanides_Payatakes_SCA2003_18_2003.pdf)
- D.21. 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-MS, 10<sup>th</sup> ADIPEC Abu Dhabi International Petroleum Exhibition & Conference, Abu Dhabi, United Arab Emirates, October 13-16, pp.379-387, <https://doi.org/10.2118/78516-MS>, [http://users.uniwa.gr/marval/publ/Valavanides\\_Payatakes\\_SPE78516\\_2002.pdf](http://users.uniwa.gr/marval/publ/Valavanides_Payatakes_SPE78516_2002.pdf)
- D.22. 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, <https://doi.org/10.3997/2214-4609.201406619>, [http://users.uniwa.gr/marval/publ/Valavanides\\_Payatakes\\_ECMORVI\\_1998.pdf](http://users.uniwa.gr/marval/publ/Valavanides_Payatakes_ECMORVI_1998.pdf).
- D.23. 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 - 5<sup>th</sup> 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>

#### National Conferences:

- D.24. Valavanides, M.S., 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 of Chemical Engineering PSCCE, Art. P-478, University of Patras, June, 2-4, [http://users.uniwa.gr/marval/publ/Valavanides\\_et al\\_2022\\_PSPM13\\_P478.pdf](http://users.uniwa.gr/marval/publ/Valavanides_et al_2022_PSPM13_P478.pdf)
- D.25. Valavanides, M.S. 2013 “Capillary vs Viscous Flow: Introduction of a Normative Methodology for Characterization of 2-Ph Flows in P.M.” *PSPM-6, 6<sup>th</sup> Panhellenic Symposium on Porous Media*, Kavala, Greece, September 9-10, [http://users.uniwa.gr/marval/publ/Valavanides\\_PSPM6\\_2013.pdf](http://users.uniwa.gr/marval/publ/Valavanides_PSPM6_2013.pdf)
- D.26. Valavanides, M.S., Kamvyssas, G., Totaj, E. 2013 “Retrospective Examination of Relative Permeability Data and Operational Efficiency Aspects for Steady-State 2-Ph Flow in Porous Media” *PSPM-6, 6<sup>th</sup> Panhellenic Symposium on Porous Media*, Kavala, Greece, Sept. 9-10, [http://users.uniwa.gr/marval/publ/Valavanides\\_et al\\_PSPM6\\_2013.pdf](http://users.uniwa.gr/marval/publ/Valavanides_et al_PSPM6_2013.pdf)
- D.27. Tsakiroglou, C., Aggelopoulos, C.A., Terzi, K., Avraam, D.G., M. Valavanides 2013 “Dependence of the Steady-State Relative Permeability Functions of Porous Media on Flow Rates: A Revisit” *PSPM-6, 6<sup>th</sup> Panhellenic Symposium on Porous Media*, Kavala, Greece, Sept. 9-10, [http://users.uniwa.gr/marval/publ/Tsakiroglou\\_et al\\_PSPM6\\_2013.pdf](http://users.uniwa.gr/marval/publ/Tsakiroglou_et al_PSPM6_2013.pdf)
- D.28. Valavanides, M.S., Skouras, E.D., Payatakes, A.C. 2009 “Energy efficiency optimization of two-phase flow processes near recovery wells in confined reservoirs, by implementation of the *DeProF* theory” *PSPM-4, 4<sup>th</sup> Panhellenic Symposium on Porous Media*, Patras, Greece, October 22-23, [http://users.uniwa.gr/marval/publ/Valavanides\\_et al\\_PSPM4\\_2009.pdf](http://users.uniwa.gr/marval/publ/Valavanides_et al_PSPM4_2009.pdf)



- D.29. Βαλαβανίδης, Μ.Σ., Παγιατάκης, Α.Χ. 1999 “Πρότυπο μόνιμης διασπαστικής ροής σε πορώδη μέσα βασισμένο σε αληθείς μηχανισμούς κλίμακας πόρων και ανάλυση σε αδρές πρότυπες ροές” 2<sup>ο</sup> Πανελλήνιο Επιστημονικό Συνέδριο Χημικής Μηχανικής, Θεσσαλονίκη 27-29 Μαΐου, Εκδόσεις Τζιόλα, ISBN 960-8050-00-6, σελ. 185-188, [http://users.uniwa.gr/marval/publ/Valavanides\\_Payatakes\\_PSXM2\\_1999.pdf](http://users.uniwa.gr/marval/publ/Valavanides_Payatakes_PSXM2_1999.pdf)
- D.30. Valavanidis, M., Polyzos, D., Paipetis, S.A. 1989 “Frequency Dependent Properties of Elastic Particle Composites” 2<sup>nd</sup> National Congress on Mechanics Hellenic Society of Theoretical and Applied Mechanics (HSTAM), Athens, June 29-July 1, [http://users.uniwa.gr/marval/publ/Valavanidis\\_etal\\_HSTAM2\\_1989.pdf](http://users.uniwa.gr/marval/publ/Valavanidis_etal_HSTAM2_1989.pdf)

## E. Presentations at Scientific Conferences (oral/poster)

### International Conferences

- E.1. 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.
- E.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
- E.3. Valavanides, M.S. 2016 “A new methodology for effective, two-phase flow characterization of pore network structures” *InterPore2016, 8<sup>th</sup> International Conference on Porous Media & Annual Meeting*, Cincinnati, OH USA, May 9-12. Book of abstracts, ISSN 2518-3826, <https://www.interpore.org/publications/conference-abstract-booklets>, [http://users.uniwa.gr/marval/publ/Valavanides\\_IPOR2016\\_1459.pdf](http://users.uniwa.gr/marval/publ/Valavanides_IPOR2016_1459.pdf)
- E.4. Valavanides, M.S., Tsakiroglou, C.D. 2015 “Systematic laboratory study of steady-state two-phase flow in porous media” *Abu-Dhabi Research Conference and Exhibition ADRAC 2015*, UAE, May 24-26
- E.5. Valavanides, M.S., Daras, T. 2015 “Configurational Entropy Maps for Steady-State Two-Phase Flows in Pore Networks implementing the DeProF model algorithm” *InterPore2015, 7<sup>th</sup> International Conference on Porous Media & Annual Meeting*, Padova, 21-24 May
- E.6. Skouras, E.D., Kalarakis, A.N., Valavanides, M.S., Burganos, V.N. 2015 “Integration of relative permeability maps for two-phase flow in porous media into FEM solvers to investigate complex field-scale flows” *InterPore2015, 7<sup>th</sup> International Conference on Porous Media & Annual Meeting*, Padova, 21-24 May
- E.7. 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 P2055 *InterPore2015, 7<sup>th</sup> International Conference on Porous Media & Annual Meeting*, Padova, 21-24 May, [http://users.uniwa.gr/marval/publ/Skouras\\_etal\\_IPOR2015\\_P2055.pdf](http://users.uniwa.gr/marval/publ/Skouras_etal_IPOR2015_P2055.pdf)
- E.8. Tsakiroglou, C.D., Aggelopoulos, C.A., Terzi, K., Avraam, D.G., Valavanides, M.S. 2015 “Analyzing the steady-state two-phase flow relative permeability functions of porous media in the terms of their dependence on capillary numbers: An experimental study” MS 1.03 P2056 *InterPore2015, 7<sup>th</sup> International Conference on Porous Media & Annual Meeting*, Padova, 21-24 May

- E.9. Skouras, E.D., Kalarakis, A.N., Valavanides, M.S., Burganos, V.N. 2015 “Two-phase flow conductivity maps implementing FEM and Lattice-Boltzmann simulators in complex pore geometries” MS 1.03 P2057 *InterPore2015, 7<sup>th</sup> International Conference on Porous Media & Annual Meeting*, Padova, 21-24 May, [http://users.uniwa.gr/marval/publ/Skouras\\_etal\\_IPOR2015\\_P2057.pdf](http://users.uniwa.gr/marval/publ/Skouras_etal_IPOR2015_P2057.pdf)
- E.10. Valavanides, M.S. 2015 “Two-Phase Flow and Pore Structure Characterization by means of Effective Operational Efficiency Indices (A conceptual approach)”MS 1.03 P2059 *InterPore2015, 7<sup>th</sup> International Conference on Porous Media & Annual Meeting*, Padova, 21-24 May, [http://users.uniwa.gr/marval/publ/Valavanides\\_IPOR2015\\_P2059.pdf](http://users.uniwa.gr/marval/publ/Valavanides_IPOR2015_P2059.pdf)
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- E.12. 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, [http://users.uniwa.gr/marval/publ/Valavanides\\_GRCFTPM\\_2012.pdf](http://users.uniwa.gr/marval/publ/Valavanides_GRCFTPM_2012.pdf)
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- E.15. Valavanides, M.S., Payatakes, A.C. 2001 “Steady-State Fully-Developed Two-Phase Flow in Porous Media: Mechanistic Model and a Conjecture Concerning the Underlying Principle” HSR 2001 3<sup>rd</sup> International Meeting of the Hellenic Society of Rheology, Patras, Greece, June 10 – 14.
- E.16. Valavanides, M.S., Payatakes, A.C. 2001 “Prediction of Interstitial Macroscopic Characteristics of Two-Phase Flow in Porous Media Using the *DeProF* True-to-Mechanism Theoretical Model” European Geophysical Society XXVI General Assembly, Nice, France, March 25-30
- E.17. Valavanides, M.S., Payatakes, A.C. 2000 “True-to-Mechanism Model of Two-Phase Flow in Porous Media using Decomposition into Prototype Flows”*2000 Annual AIChE Meeting*, Los Angeles, CA, USA, Nov. 12-17.
- E.18. 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, Proctor Academy, Andover N.H., USA, August 2-7, (1998).

- E.19. Valavanides, M.S., Payatakes, A.C. 1998 “New Macroscopic Theory of Two-Phase Flow in Porous Media based on the Actual Pore-Scale Mechanisms”, *HSR 1998*, 2<sup>nd</sup> Meeting of the Hellenic Society of Rheology and International Symposium, Crete, Greece, Aug. 31-Sept. 2.
- E.20. 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 International Symposium OIL FIELD CHEMICALS*, Geilo, Norway, March 17-20
- E.21. 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 Two Phase Flow in Porous Media” *Gordon Research Conference on "Modeling of Flow in Permeable Media"* New Hampshire, Aug.10-14.

#### National Conferences

- E.22. Σκούρας, Ε.Δ., Παρασκευά, Χ.Α., Βαλαβανίδης, Μ.Σ., Καλαράκης, Α. Ν. Καλογήρου, Ι., Μαυρίδης, Κ. 2015 “Υπολογιστική Διερεύνηση Ροϊκού Πεδίου Βιολογικών Υγρών σε Κλινικά Σημαντικές Συνθήκες με Απλεγματικές Μεθόδους” 10<sup>ο</sup> Πανελλήνιο Συνέδριο Χημικής Μηχανικής, Εργασία 0280, ΠΑΤΡΑ, 4 - 6 Ιουνίου, 2015, <http://pesxm10.chemeng.upatras.gr/papers/15/280>
- E.23. Valavanides, M.S., Payatakes, A.C. “Energy Efficiency of 2ΦFlow in P.M. Processes — Correlation with Multiplicity of Internal Flow Arrangements (Preliminary Results)” *PSPM-4, 4<sup>th</sup> Panhellenic Symposium on Porous Media*, Patras, Greece, October 22-23, [http://users.uniwa.gr/marval/publ/Valavanides\\_Payatakes\\_PSPM4\\_2009.pdf](http://users.uniwa.gr/marval/publ/Valavanides_Payatakes_PSPM4_2009.pdf)

#### F. Conventions / Workshops / Forums

- F.1. Valavanides, M. 2003 “FORTHPHOTONICS: Industrial Research for the development and certification of innovative spectral imaging technology diagnostic systems” 2<sup>nd</sup> *Competitiveness Forum, Ministry of Development Gen. Secretariat of Research & Technology*, Athens, 2 December
- F.2. Valavanides, M.S. 2001 “Modes of Exploiting Mature Research Results and Innovation Financing”, *Micro & Nano Technology and Applications Technology Transfer and Business Partnership Event & Exploitation & Commercialisation of Research Results*, Thessaloniki, 15-16 November
- F.3. Valavanides, M.S. 2001 “Support actions for University spin-offs”, *IRC GOOD PRACTICE WORKSHOPS: Innovation Financing*, Innovation Relay Centres - Innovation Directorate - European Commission DG Enterprise, Cracow, Poland, 10-11 May
- F.4. Valavanides, M.S. 1999 “5<sup>th</sup> Framework Program & INCO ”Invited presenter, Eastern Mediterranean Engineers Convention, TCG/DEC, Heraklion, Crete, Greece, Nov. 25-28

#### G. Technical Reports - Comments

- G.1. Valavanides, M.S., Totaj, E., Tsokopoulos, M. (2015) “Retrospective Examination of Relative Permeability Data on Steady-State 2-Ph Flow in Porous Media Transformation of Rel-PermData ( $k_{ro}$ ,  $k_{rw}$ ) into Operational Efficiency Data ( $f_{EU}$ )”



ImproDeProF /Archimedes III, project internal report  
<http://users.uniwa.gr/marval/ArchIII/retrorelperm.pdf>

G.2. Valavanides, M.S. (2013) “[Collection and Retrospective Examination of Relative Permeability Data on Steady-State 2-Phase Flow in Porous Media](#)” *Research Spotlight, InterPore Newsletters* **48**, *InterPore*<sup>TM</sup> – the International Society for Porous Media

G.3. Valavanides, M.S. (2013) “Comments on [Analysis of Fundamentals of Two-Phase Flow in Porous Media Using Dynamic Pore-Network Models: A Review by V. Joekar-Niasar and S. M. Hassanizadeh (2012) *Crit. Rev. Env. Sci. Tech.* 42:18 pp. 1895–1976]” manuscript submitted to *Crit. Rev. Env. Sci. Tech.*, unsolicited, [http://users.uniwa.gr/marval/publ/Valavanides\\_CommentsCREST\\_2013.pdf](http://users.uniwa.gr/marval/publ/Valavanides_CommentsCREST_2013.pdf)

## H. Invited Lectures

H1. Valavanides, M.S. 2022 “*Flow Dependent Relative Permeability Scaling for Steady-State Two-Phase Flow in Porous Media: Laboratory Validation on a Microfluidic Network*” *Pretty Porous Science Lecture #18* SFB1313 invited lecture, Institute of Applied Mechanics, Faculty of Civil and Environmental Engineering, University of Stuttgart, Germany, November 26, <https://www.sfb1313.uni-stuttgart.de/news/Pretty-Porous-Science-Lecture-18-Flow-Dependent-Relative-Permeability-Scaling-for-Steady-State-Two-Phase-Flow-in-Porous-Media-Laboratory-Validation-on-a-Microfluidic-Network-by-Marios-Valavanides/>

H2. Valavanides, M.S. 2019 “*A new theoretical framework for two-phase flows in porous media – Recent advances and perspectives*” SFB1313 invited lecture, Institute of Applied Mechanics, Faculty of Civil and Environmental Engineering, University of Stuttgart, Stuttgart, Germany, November 26, <https://www.sfb1313.uni-stuttgart.de/news/SFB-1313-Lecture-by-Marios-Valavanides/>

H3. 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, May14-17

H4. Valavanides, M.S. 2016 “*Development of the DeProF tentative theory for steady-state flow in porous media*” invited lecture, Dept of Earth Sciences/Faculty of Geosciences, Utrecht University (UU), Utrecht, The Netherlands, October 18, [http://users.uniwa.gr/marval/publ/Valavanides\\_UU\\_2016\\_ColloqSeriesPresent.pdf](http://users.uniwa.gr/marval/publ/Valavanides_UU_2016_ColloqSeriesPresent.pdf)

H5. 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, [http://users.uniwa.gr/marval/publ/Valavanides\\_NTNU\\_2016\\_GenPhysColloq.pdf](http://users.uniwa.gr/marval/publ/Valavanides_NTNU_2016_GenPhysColloq.pdf)

H6. 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

## I. Educational Notes

Valavanides, M.S. 2004 lecture notes on “*Development and Transfer of Technology & Know-how*” course (in Greek), Dept. of Shipbuilding Engineers, TEI Athens, [http://users.uniwa.gr/marval/publ/Valavanides\\_TT\\_2008.pdf](http://users.uniwa.gr/marval/publ/Valavanides_TT_2008.pdf)

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