

VASILIS BONTOZOGLOU

Professor of Transport Phenomena and Process Equipment

Home address

Tsitsilianou 1
382 22 Volos, Greece

Tel: (+30 24211) 01121

Work address

University of Thessaly
Dept. of Mechanical Engineering
Pedion Areos
383 34 Volos, Greece

Tel: (+30 24210) 74069
Fax: (+30 24210) 74050
e-mail: bont@mie.uth.gr

Education

Doctoral Degree (Ph.D.) in Chem. Eng.:
Master's Degree (M.S.) in Chem. Eng.:
Diploma in Chem. Eng.:

University of Illinois at U-C, Oct. 1988
University of Illinois at U-C, Oct. 1986
University of Thessaloniki, March 1982

Expertise

Transport Phenomena, Multiphase Flows, Computational & Experimental Fluid Dynamics, Analysis and Design of Process Equipment. Respiratory Flows and Particle Transport, Renewable Energies (Biomass, Geothermal).

Professional record

May 1993 -	Department of Mechanical Engineering, University of Thessaly
Sept. 1988 - April 1993	Researcher, Chemical Process Engineering Research Institute (CPERI), Thessaloniki, Greece
Sept. 1984 - Sept. 1988	Teaching/Research assistant Univ. of Illinois at Urbana-Champaign, USA

Publications in Refereed Journals

1. V. Bontozoglou & T. J. Hanratty 1988 Effects of finite depth and current velocity on large amplitude Kelvin-Helmholtz waves. *J. Fluid Mech.*, **196**, 187-204.
2. V. Bontozoglou & T. J. Hanratty 1989 Wave height estimation in stratified gas-liquid flows. *AIChE J.*, **35**, 1346-1350.
3. V. Bontozoglou & T. J. Hanratty 1990 Capillary-gravity Kelvin-Helmholtz waves close to resonance. *J. Fluid Mech.*, **217**, 71-91.
4. V. Bontozoglou, M. Kaliadasis, & A. I. Karabelas 1991 Inviscid free-surface flow over a periodic wall. *J. Fluid Mech.*, **226**, 189-203.
5. V. Bontozoglou 1991 Weakly nonlinear Kelvin-Helmholtz waves between fluids of finite depth. *Intl. J. Multiphase Flow*, **17**, 509-518.
6. V. Bontozoglou 1991 Large amplitude Kelvin-Helmholtz waves in gas-liquid flows. *Intl. J. Multiphase Flow*, **18**, 307-311.
7. V. Bontozoglou & A. I. Karabelas 1991 Numerical calculation of simultaneous absorption of H₂S and CO₂ in aqueous hydroxide solutions. *Ind. Eng. Chem. Res.*, **30**, 2598-2603.
8. N. Andritsos, V. Bontozoglou & T. J. Hanratty 1992 Transition to slug flow in horizontal pipes. *Chem. Eng. Comm.*, **118**, 361-385.
9. V. Bontozoglou & A. I. Karabelas 1993 Simultaneous absorption of H₂S and CO₂ in NaOH solutions. Experimental and numerical study of the performance of a short-time contactor *Ind. Eng. Chem. Res.*, **32**, 165-172.

10. G. Breyiannis, V. Bontozoglou, D. Valougeorgis & A. Goulas 1993 Large-amplitude interfacial waves on a linear shear flow in the presence of a current. *J. Fluid Mech.*, **249**, 499-519.
11. G. Breyiannis, V. Bontozoglou, D. Valougeorgis & A. Goulas 1994 An inviscid investigation of the initiation of roll waves in horizontal gas-liquid flows. *Intl. J. Multiphase Flow*, **20**, 957-967.
12. V. Bontozoglou & A. J. Karabelas 1995 Direct-contact steam condensation with simultaneous noncondensable gas absorption. *AIChE J.*, **41**, 241-250.
13. G. Papapolymerou & V. Bontozoglou 1997 Decomposition of NH₃ on Pd and Ir: comparison with Pt and Rh. *J. Molecular Catalysis A: Chemical*, **120**, 165-171.
14. V. Bontozoglou & G. Papapolymerou 1997 Laminar film flow down a wavy incline. *Intl. J. Multiphase Flow*, **23**, 67-79.
15. P. Tortopidis & V. Bontozoglou 1997 Mass transfer in gas-liquid flow in small-diameter tubes. *Chem. Eng. Sci.*, **52**, 2231-2237.
16. V. Bontozoglou & G. Papapolymerou 1998 Wall-triggered interfacial resonance in laminar gas-liquid flow. *Intl. J. Multiphase Flow*, **24**, 131-143.
17. G. Haidemenopoulos, N. Hasiotis, G. Papapolymerou, & V. Bontozoglou 1998 Hydrogen absorption into aluminum alloy 2024-T3 during exfoliation and alternate immersion testing. *Corrosion*, **54**, 73-78.
18. V. Bontozoglou 1998 A numerical study of interfacial transport to a gas-sheared wavy liquid. *Int. J. Heat Mass Transfer*, **41**, 2297-2305.
19. M. Vlachogiannis, V. Bontozoglou, Ch. Georgalas & G. Litinas 1999 Desalination by mechanical compression of humid air. *Desalination*, **122**, 35-42.
20. N. Malamataris & V. Bontozoglou 1999 Computer aided analysis of viscous film flow along an inclined wavy wall. *J. Comp. Phys.*, **154**, 372-392.
21. E. Haritidou, G. Papapolymerou, G. N. Haidemenopoulos, N. Hasiotis, & V. Bontozoglou 1999 Characterization of trapped hydrogen in exfoliation corroded aluminum alloy 2024. *Scripta Materialia*, **41**, 1327-1332.
22. V. Bontozoglou 2000 Laminar film flow along a periodic wall. *Computer Modeling Engng. & Sciences*, **1**, 129-138.
23. M. Vlachogiannis & V. Bontozoglou 2001 Observations of solitary wave dynamics of film flows. *J. Fluid Mech.*, **435**, 191-215.
24. M. Vlachogiannis & V. Bontozoglou 2002 Experiments on laminar film flow along a corrugated wall. *J. Fluid Mech.*, **457**, 133-156.
25. P. Vlasogiannis, G. Karagiannis, P. Argyropoulos & V. Bontozoglou 2002 Air-water two-phase flow and heat transfer in a plate heat exchanger. *Intl. J. Multiphase Flow*, **28**, 757-772.
26. N. Malamataris, M. Vlachogiannis & V. Bontozoglou 2002 Solitary waves on inclined films: Flow structure and binary interactions. *Phys. Fluids*, **14**, 1082-1094.
27. K. Serifi, N. Malamataris & V. Bontozoglou 2004 Transient flow and heat transfer phenomena in inclined wavy films. *Int. J. Thermal Sci.* **43**, 761-767.
28. N. Divinis, C. S. Panoutsos, A. C. Michels, M. C. Snee, R. deBruin, H. Th. Lotz, T. D. Karapantsios, M. Kostoglou & V. Bontozoglou 2004 Bubbles growing in supersaturated solutions at reduced gravity. *AIChE J.*, **50**, 2369-2382.
29. K. Argyriadi, K. Serifi & V. Bontozoglou 2004 Nonlinear dynamics of inclined films under low-frequency forcing. *Phys. Fluids*, **16**, 2457-2468.
30. M. Kostoglou, N. Divinis, T. D. Karapantsios & V. Bontozoglou 2005 Self-similar growth of a gas bubble induced by localized heating: the effect of temperature-dependent transport properties. *Chem. Eng. Sci.*, **60**, 1673-1683.
31. P. V. Petroyiannis, Al. Kermanidis, E. Kamoutsi, Sp. G. Pantelakis, V. Bontozoglou and G. N. Haidemenopoulos 2005 Evidence on the corrosion-induced hydrogen embrittlement of the 2024 aluminum alloy. *Fatigue & Fracture of Engng Materials & Structures*, **28**, 565-574.
32. K. Argyriadi, M. Vlachogiannis & V. Bontozoglou 2006 Experimental study of inclined film flow along periodic corrugations: The effect of wall steepness. *Phys. Fluids*, **18**, 012102:1-15
33. E. Kamoutsi, Sp. G. Pantelakis, V. Bontozoglou and G. N. Haidemenopoulos 2006 Corrosion-induced hydrogen embrittlement in aluminum alloy 2024. *Corrosion Science*, **48**, 1209-1224.

34. N. Divinis, T. D. Karapantsios, R. deBruin, M. Kostoglou, V. Bontozoglou & J. C. Legros 2006 Lateral motion and interaction of dissolved gas bubbles growing over spherical and plate heaters. *Microgravity Science & Technology* **18**, 204-209.
35. N. Divinis, T. D. Karapantsios, R. deBruin, M. Kostoglou, V. Bontozoglou & J. C. Legros 2006 Bubble dynamics during degassing of dissolved gas saturated solutions at microgravity conditions. *AIChE J.*, **52**, 3029-3040.
36. J. Tihon, K. Serifi, K. Argyriadi & V. Bontozoglou 2006 Solitary waves on inclined films: Their characteristics and the effects on wall shear stress. *Exp. Fluids*, **41**, 79-89.
37. K. Ntampeglitis, A. Riga, V. Karayannis, V. Bontozoglou & G. Papapolymerou 2006 Decolorization kinetics of Procion H-ex1 dyes from textile dyeing using Fenton-like reactions. *J. Hazardous Materials*, **136**, 75-84.
38. V. Bontozoglou & K. Serifi 2008 Falling film flow along steep two-dimensional topography: The effect of inertia. *Intl. J. Multiphase Flow*, **34**, 734-747.
39. A. Wierschem, V. Bontozoglou, C. Heining, H. Uecker & N. Aksel 2008 Linear resonance in viscous films on inclined wavy planes. *Intl. J. Multiphase Flow*, **34**, 580-589.
40. T. D. Karapantsios, M. Kostoglou, N. Divinis & V. Bontozoglou 2008 Nucleation, growth and detachment of neighboring bubbles over miniature heaters. *Chem. Eng. Sci.*, **63**, 3438-3448.
41. A. Kavga, T. Panidis, V. Bontozoglou, S. Pantelakis 2008 Investigation of the Potential of Long Wave Radiation Heating to Reduce Energy Consumption for Greenhouse Heating. *Acta Hort.*, **801**, 741-748.1.
42. C. Heining, V. Bontozoglou, N. Aksel & A. Wierschem 2009 Non-linear resonance in viscous films on inclined wavy planes. *Intl. J. Multiphase Flow*, **35**, 78-90.
43. A. Kavga, T. Panidis, V. Bontozoglou, S. Pantelakis 2009 Infrared Heating of Greenhouses Revisited: An Experimental and Modeling Study. *Trans. ASABE*, **52**, 2055-2065.
44. M. Vlachogiannis, A. Samandas, V. Leontidis, V. Bontozoglou 2010 Effect of channel width on the primary instability of inclined film flow. *Phys. Fluids*, **22**, 012106.
45. V. Leontidis, J. Vatteville, M. Vlachogiannis, N. Andritsos, V. Bontozoglou 2010 Nominally two-dimensional waves in inclined film flows in channels of finite width. *Phys. Fluids*, **22**, 112106.
46. Ch. Tzotzi, M. Vlachogiannis, V. Bontozoglou, N. Andritsos 2011 Effect of fluid properties and pipe inclination on flow pattern in two-phase gas-liquid flows. *Ind. Eng. Chem. Res.*, **50**, 645-655.
47. P.-K. Nguyen, V. Bontozoglou 2011 Steady solutions of inertial film flow over strongly undulated substrates. *Phys. Fluids*, **23**, 052103.
48. A. Georgantaki, M. Vlachogiannis, J. Vatteville, V. Bontozoglou 2011 Measurements of liquid film flow as a function of fluid properties and channel width: Evidence for surface-tension-induced long-range transverse coherence. *Phys. Rev. E*, **84**, 026325.
49. A. Kavga, T. Panidis, V. Bontozoglou, S. Pantelakis 2012 Experimental investigation of the energy needs for a conventionally and an infrared-heated greenhouse. *Adv. Mech. Eng.*, **2012**, 789515.
50. A. Georgantaki, M. Vlachogiannis and V. Bontozoglou 2012 The effect of soluble surfactants on liquid film flow. *J. Phys.: Conf. Series*, **395**, 012165.
51. P.-K. Nguyen, M. G. Pradas, S. Kalliadasis and V. Bontozoglou 2013 Bound-state formation in interfacial turbulence: direct numerical simulations and theory. *J. Fluid Mech.*, **716** (R2), 1-11.
52. Z. Cao, M. Vlachogiannis and V. Bontozoglou 2013 Experimental evidence for a short-wave global mode in film flow along periodic corrugations. *J. Fluid Mech.*, **718**, 304-320.
53. G. Karapetsas and V. Bontozoglou 2013 The primary instability of falling films in the presence of soluble surfactants. *J. Fluid Mech.*, **729**, 123-150.
54. G. Karapetsas and V. Bontozoglou 2014 The role of surfactants on the mechanism of the long-wave instability in liquid film flows. *J. Fluid Mech.*, **741**, 139-155.
55. S. Chakraborty, P.-K. Nguyen, V. Bontozoglou and C. Ruyer-Quil, 2014 Extreme solitary waves on falling liquid films. *J. Fluid Mech.*, **745**, 564-591.
56. G. Karapetsas and V. Bontozoglou 2015 Non-linear dynamics of a viscoelastic film subjected to a spatially periodic electric field. *J. Non-Newtonian Fluid Mech.*, **217**, 1-13.
57. S. Georgakakou, K. Gourgoulianis, Z. Daniil and V. Bontozoglou 2016 Prediction of particle deposition in the lungs based on simple modeling of alveolar mixing. *Respir. Physiol. Neurobiol.*, **225**, 8-18.

58. A. Georgantaki, M. Vlachogiannis and V. Bontozoglou 2016 Measurements of the stabilisation of liquid film flow by the soluble surfactant sodium dodecyl sulfate (SDS). *Intl. J. Multiphase Flow*, **86**, 28-34.
59. K. Gourgoulanis, Z. Daniil, K. Athanasiou, S. Rozou and V. Bontozoglou 2017 Application of a one-dimensional computational model for the prediction of deposition from a dry powder inhaler. *J. Aerosol Medicine and Pulmonary Drug Delivery*, **30**, 435-443.
60. V. Bontozoglou 2018 The effect of adsorption modeling on the stability of surfactant-laden liquid film flow. *Acta Mechanica*, **229**, 535-547.
- 61.

Reviewer of Research Articles

Journal of Fluid Mechanics, Physics of Fluids, Chemical Engineering Science, Intl. Journal of Multiphase Flow, Acta Mechanica, AIChE Journal, ASME-Journal of Fluids Engineering, European Journal of Mechanics/B-Fluids, Nuclear Engineering and Design, Chemical Engineering Journal, Computers and Fluids, Respiratory Physiology and Neurobiology, Microfluidics and Nanofluidics, Chemical Engineering Research and Design, Afrika Matematika, Journal of Engineering Mathematics, Energy Conversion and Management, Physical Review E, International Journal of Thermal Sciences, Physical Review Fluids, Advances in Colloid and Interface Science, Chemical Engineering & Processing: Process Intensification, Flow Turbulence and Combustion

Distinctions

- 1986 University of Illinois, School of Chemical Sciences: Best Teaching Assistant Award
- 2004 ICHMT Conference on Transient Heat Transfer Phenomena: Best Oral Paper Award
- 2005 University of Thessaly, Dept. of Mechanical Engineering: Best Instructor Award
- 2006 University of Bayreuth, Germany: Visiting Professor
- 2006 University Paul Sabatier (IMFT), France: Visiting Professor
- 2007-14 Member of Eurotherm Committee, The European Society for Thermal Sciences and Heat Transfer
- 2007- Member of the Scientific Committee of International Conferences on multiphase flow, fluid mechanics and heat transfer: ExHFT-7 Krakow 28/6-3/7/2009, 6th European Thermal Sciences Conference Futuroscope 4-7/9/2012, ExHFT-8 Lisbon 16-20/6/2013, 9th Intl. Conf. on Multiphase Flow Florence 22-27/5/2016, ExHFT-9 Iguazu Falls 12-16/6/2017, ICMFHT'20 Lisbon 12-14/4/2020
- 2011- Member of Advisory Board, International Journal of Multiphase Flow (Elsevier)
- 2013- Member of Advisory Board, Acta Mechanica (Springer)
- 2013- Corresponding Member, International Information Center on Multiphase Flow, Japanese Society of Multiphase Flow
- 2016 University of Savoie, France: Visiting Professor
- 2019 University of Thessaly, Dept. of Mechanical Engineering: Best Instructor Award

Invited Talks

- «The method of perturbation expansions», Chemical Engineering, Univ. Thessaloniki 1989
- «Free surface flows», Chemical Engineering, Univ. Thessaloniki 1989
- «Linear stability analysis», Applied Physical Sciences, Univ. Thessaloniki 1989
- «Ideal flow of a liquid film on a periodic wall», CPERI, EKETA, Greece, 1992
- «Wall-triggered resonance in film flows», Chemical Engineering, University of Patras, 1996
- «Laminar film flow along a periodic wall», IUTAM Symposium on Nonlinear Waves -University of Notre Dame, USA, 1999.
- «Computer-aided analysis of the nonlinear evolution of inclined film flows», Institute of Chemical Process Fundamentals (ICPF) Prague, 2000.
- «Experiments on laminar film flow along a corrugated wall», INTAS Meeting, Eindhoven 2000.
- «Experiments and simulations on inclined film flow», CPERI, EKETA, Greece, 2001.

«Computer simulation of flow along corrugated walls», Dept. of Applied Mechanics, University of Bayreuth, Germany, 2005.

«Inertial effects in film flow along flat and deformed walls», Dept. of Physics & Dept. of Applied Mechanics, University of Bayreuth, Germany, 2006.

«Inertial effects in film flow over periodically corrugated walls», LIMSI-CNRS, Univ. de Paris-Sud.

«Inertial effects in film flow over periodically corrugated walls», Institute de Mechanique des Fluides (IMFT), Toulouse, France, 2006.

«Transport phenomena: Mathematics, physics or engineering?», 1st Hellenic Congress of Youth for the Physical Sciences, Kalabaka, Greece, 2007.

«Inertial effects in film flow along strongly deformed walls: Deep periodic corrugations and abrupt steps», 6th Intl. Congress of Industrial and Applied Mathematics, Minisymposium on Influence of boundary topographies on film and Couette flows, Zurich, 2007.

«Liquid film flow along flat and non-flat walls: Experiment and simulation», Marie-Curie ITN Multiflow, kick-off meeting, London, 2009.

«The effect of Kapitza number and channel width on liquid film flow», Intl. Conf. On Multiscale Complex Fluid Flows, Brussels, 2010.

«The role of the transverse dimension in the instabilities and transitions of inclined film flow», 82nd GAMM annual meeting, Graz 2011.

«Geometric modifications of inclined liquid film flow», Dept. of Mechanical Engineering, Technion, Haifa, 2011.

«The effect of geometric modifications on the primary instability of liquid film flow», Week of Science, UCM, Madrid, 2011.

«Geometric modifications of liquid film flow», Dept. of Mathematics, Imperial College, London, 2011.

«The primary instability of falling liquid films in the presence of soluble surfactants», 10th HSTAM Intl. Conf. in Mechanics, Chania, 2013.

«Stabilization of liquid film flow by soluble surfactants», GRD Ruissellement et films cisailles, ONERA et CMF, Toulouse, 2016.

«Geometric modifications of liquid film flows», GRD Ruissellement et films cisailles, ONERA et CMF, Toulouse, 2016.

«Inhalation of dry-powders: predictions, measurements, questions», Presentation to the CEO and the Research Department of ELPEN Pharmaceutical, Pikerimi, Athens, 2017.

«Modeling of air flow and particle transport in the lungs», Seminar, Pulmonology Clinic, Medical School of the University of Thessaly, Larisa, 2018.

«Mathematical models for the respiratory tract», New Generation of Inhalers, Scientific event organized by ELPEN Pharmaceutical, Thessaloniki, 2019.

Administrative Experience

Vice-Rector of Research and Development, University of Thessaly (2009-2012)

President, Research Committee of the University of Thessaly (2009-2012)

Director, Transport Processes & Process Equipment Laboratory (1993-)

Director, Energy Sector of the Mechanical Engineering Department (2004-2006)

Member, Senate of the University of Thessaly (1999-2002)

Head, Department of Mechanical Engineering (1999-2001)

Member of the Library Committee of the University of Thessaly (1994-)

Recent Funded Research Projects

- "Electrochemical sensors for flow measurements" EU/COST (2000-2003)
- "Wavy flow of liquid films under complicate conditions" EU/INTAS (2000-2003)
- "Design and development of a charcoal production kiln using biomass" General Secretariat of Research and Technology (GSRT), Greece (2002-2004)
- "Energy optimization of multiphase flows in petrochemical plants" GSRT, Greece (2003-2005)

- "Corrosion-induced hydrogen embrittlement of 2024 and 6013 aluminium alloys" AIRBUS, Germany (2003-2004)
- "Aeronautical application of wrought magnesium" EU/STREP (2005-2007)
- "Experimental and computational understanding of gas-liquid two-phase flows" Ministry of Education, Greece (2005-2007)
- "Multiscale complex fluid flows and interfacial phenomena" EU/PEOPLE-ITN (2009-2012)
- "Dynamics of electrically-induced flows of viscoelastic materials" GSRT, Greece (2012-2014)
- "Simulation of respiratory flows" ELPEN Pharmaceutical (2015-2016)
- "Simulation and pharmaceutical technologies for advanced patient-tailored inhaled medicines (SimInhale)" EU/COST (2015-2018)
- "In vitro in vivo correlations of inhaled drugs" ELPEN Pharmaceutical (2019-2020)