

Aristotle University of Thessaloniki (AUTH)

School of Chemistry,
Division of Chemical Technology
Thessaloniki, Greece

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PERSONAL DETAILS

Date of Birth : 20th October 1977
Place of Birth : Thessaloniki, Greece
Nationality : Greek
Marital status : Married, one child
Military service : Completed (Aug. 2006/07)

EDUCATION

Doctor of Philosophy, Chemical Engineering, Multiphase Flows – AUTH, March 2006.

Dissertation: Study of stratified co-current gas-liquid downflow in slightly inclined pipes,
Three member committee: Prof. S.V. Paras, Prof. A.I. Karabelas, Prof. N. Andritsos.

Master of Science, Environmental Catalysis – Greek Open University, Sept. 2009.

Dissertation: Future Trends in Potable water treatment, Supervisor: Prof. P. Samaras.

Diploma in Chemical Engineering (3rd in 110) – AUTH, July 2001.

Dissertation: Local velocities inside the gas phase in counter current two-phase flow in a narrow vertical channel. Supervisor: Prof. S.V. Paras.

CAREER

Research Fellow – Team manager: 2009 - present

Funded by European Space Agency and supported by AUTH, School of Chemistry, Division of Chemical Technology; in co-operation with Prof. T.D. Karapantsios.

Management of COST Action MP1106: 2012 – present

Funded by European Commission supported by AUTH, School of Chemistry, Division of Chemical Technology; in co-operation with Prof. T.D. Karapantsios.

Leader of Early Stage Researchers Group of COST Action MP1106: 2012 – 2016

AUTH, School of Chemistry, Division of Chemical Technology.

Engineering Consultancy: 2007 - 2009

Consultancy at the firm HYETOS (www.hyetos.gr); in matters concerning Design of Water, Wastewater and Solid waste Treatment Plants, Modeling of Hydraulic Works and Environmental Processes, Environmental Assessments, Project Inception, Application and Management:

PROJECTS LIST

As a Research Fellow – Team manager: 2009 - present

AUTh, School of Chemistry, Division of Chemical Technology; in co-operation with Prof. T.D. Karapantsios.

- Projects:
1. Influence of gravity conditions on mass and heat transfer in porous media. (**European Space Agency** TRP, ESTEC/22470/09/NL/Cbi, 2009), 2009-2012, Budget: 200k€.
Responsibilities: Designing an experimental apparatus capable of studying the coupled heat and mass transport phenomena during heating (with hot oil) a liquid saturated porous material. Experiments were performed in terrestrial and hypergravity levels (up to $9g_{\text{earth}}$) at the Large Diameter Centrifuge locating at the facilities of ESA/ESTEC Noordwijk. Experiments included simultaneous monitoring of the bubble dynamics on the porous surface and temperature recordings below the porous surface.
 2. Influence of gravity conditions on mass and heat transfer in porous media, Phase II. (Composer of the proposal) (**European Space Agency** CCN to /22470/09/NL/Cbi, 201), 2012-2014, Budget: 240k€.
Responsibilities: Designing a special experimental apparatus capable of studying the coupled heat and mass transport phenomena during heating a liquid saturated porous material in microgravity environment. Experiments will be performed during an ESA founded Parabolic Flight Campaign (Apr. 2014).
 3. Highly efficient flow boiling macro-structured/ macro-porous channels. (**European Space Agency** NPI, 4000106405/12/NL/PA, 2012), 2012-2016, Budget: 180k€.
(Composer of the proposal)
Responsibilities: Designing and performing experiments concerning the flow boiling over modified surfaces at various hyper-gravity levels. Co-supervising and advising a PhD student.
 4. Multiscale Analysis of Boiling. (**European Space Agency** CCN 1 ESA-AO-2004-PCP-111/ELIPS-2), 2013-2016
Budget: 90k€.
Responsibilities: Modeling the bubble dynamics (e.g. bubble detachment, bubble rising velocity) during the boiling over porous surfaces, using both commercial and custom-made codes.
 5. Active Deformable micro-Cutters with Nano-Abrasives - ADCnano - GSRT, Cooperation II, founded by the European Social Fund - ESF.

During the Management of COST Action MP1106: 2012 - 2016

- Action: Smart and green interfaces: from single bubbles/drops to industrial, environmental and biomedical applications (ESF/COST CGA-MP1106), (European Cooperation in the Field of Scientific & Technical Research 2012),
Budget (estimated): 0.9M€.
Responsibilities: As **Grant Holder**: Preparation of all meetings, training schools and short term missions, their planning, invitations, issuing minutes and reports, executing all relevant payments to the final beneficiaries (i.e. more than 120 scientists-members of our Action) according to the applicable COST reimbursement rules, and the equivalent management of the COST financial instruments.

As **Early Stage Researchers Group Leader**: Coordinating a group of 30 young researchers and providing knowledge and experience in a diversity of science related matters.

During Engineering Consultancy: 2007 - 2009

Consultancy at the firm HYETOS; Selected projects in matters concerning Design of Water, Wastewater and Solid waste Treatment Plants, Modeling of Hydraulic Works and Environmental Processes, Environmental Assessments, Project Inception, Application and Management:

- Projects:
1. Atmospheric dispersion modeling of the fugitive particulate matter from overburden dumps with numerical and integral models, 2008, *Budget: 15k€.*
 2. Design of pneumatic waste conveyance system in the city of Grevena, 2008, *Budget: 150k€.*
 3. Design of medium scale waste biological systems, 2009-2012, *Budget: 120k€.*
 4. Soil Sustainability (So.S) - Soil Sustainable Management in a Mediterranean River basin based on the European Soil Thematic Strategy, (LIFE07 ENV/GR/000278), *Budget: 1.5M€.*

GRANTS AND AWARDS

- 2012: Honorable grand for excellent academic performance as young researcher by the Research Committee of AUTH.
- 2004-2006: Research Scholarship for Basic Research, "Heracleus" General Secretariat of Research and Sciences, *Budget: 40k€.*
- 2002-2004: Scholarship for Ph.D. students given under successful exams in "Computational Dynamics", Greek Institute of State Scholarships.
- 2004: Honorable grand for excellent young Ph.D students by the Research Committee of AUTH.
- 2003: "Marie Curie Fellowship", Continuation of research in Trondheim, Norway, Norwegian University of Science and Technology (NTNU); Supervisor, Prof. O. J. Nydal.
- 2001-2002: "CYCLOP" Scholarship, Chemical Process Engineering Research Institute (CPERI).
- 1998-1999: Honorable distinction for the academic performance, by the National Technical Chamber of Greece,
- 1996-1997: Honorable distinction for the academic performance during the 1st year of studies, by the National Foundation of Scholarships.

TEACHING AND ADVISING (2ND SUPERVISOR)

I. AUTH, School of Chemistry, Division of Chemical Technology:

Co-advisor of the following Ph.D and M.Sc. thesis:

- Thesis:
1. Maria Vlachou, Ph.D., Highly efficient flow boiling macro-structured/ macro-porous channels, 2012-2016.
 2. Angelos Zamanis, M.Sc., A novel rapid test for oil quality determination, 2012-2013.
 3. Ariadni Chatzidafni, M.Sc., Study of two-phase bubble flow with Electrical Resistance Techniques, 2009-2010.

II. AUTH, Department of Chemical Engineering, Section of Analysis, Design and Control of Chemical Processes:

Co-advisor of the following thesis:

- Thesis:
1. Christos Kolimenos, Diploma Thesis, Surfactant induced effects on co-current gas-liquid flow in slightly inclined pipes, 2006-2007.
 2. Ariadni Chatzidafni, Diploma Thesis, Liquid layer characteristics in gas-liquid up-flow in slightly inclined pipes: Effect of surfactant additives, 2005-2006.

Teaching Assistant:

While being a Ph.D. student (2001-2006), I taught the following undergraduate courses:

1. Multiphase flows,
2. Measurements in Chemical Engineer Processes,
3. Chemical Engineering Laboratory II,
- 4 & 5. Technical-Economical Design of Chemical Plants I & II.

PATENT

1. Rapid test for frying oil rejection, *submitted*.
2. Rotary Fryer, *pending*.

LANGUAGES

Greek : Native speaker
English : Fluently

International Journals

Prepared and to be shortly submitted:

1. Lioumbas, J.S., Kostoglou, M. & Karapantsios, T.D. "Transport phenomena during the heating of a liquid-saturated porous medium", *International Journal of Heat and Mass Transfer*.
2. Lioumbas, J.S., Karapantsios, T.D. "Bubble Dynamics during Frying", *Physics of Fluids*.
3. Lioumbas, J.S., Karapantsios, T.D. "Bubble Dynamics during Boiling in Porous Media", *International Journal of Multiphase Flows*.
4. Lioumbas, J.S., Karapantsios, T.D. "Frying in Space", *International Journal of Multiphase Flows*.

Accepted for publication/published:

5. M. C. Vlachou, J. S. Lioumbas, T. D. Karapantsios, "Heat transfer enhancement in boiling over modified surfaces: A critical review", *Interfacial Phenomena and Heat Transfer*, 0303 (2016)
6. Lioumbas, J.S., Georgiou, E. & Karapantsios, T.D. "Effect of below CMC surfactant concentration on free foam drainage " *Journal of Colloid and Interface Science*.
7. Lioumbas, J.S. & Karapantsios, T.D. "Bubble dynamics during the heating of a liquid-saturated porous medium", *International Journal of Heat and Mass Transfer*.
8. Kostoglou, M., Lioumbas, J.S. and Karapantsios, T.D. 2014 "Inverse population balance treatment of bubble coalescence in foams", *Journal of Colloid and Interface Science*.
9. Lioumbas, J.S., Chatzidafni, A. & Karapantsios, T.D. 2014 "Spatial Considerations on Electrical Resistance Tomography Measurements", *Measurement Science and Technology*, 25 055303.
10. Lioumbas, J.S. & Karapantsios, T.D. 2014, "Effect of Increased Gravitational Acceleration in Potato Deep-Fat Frying", *Food Research International*, Vol. 55, pp. 110-118. (Score in Scopus Altmetric in 1/10/2014: 204)
11. Lioumbas, J.S., Zamanis, A. & Karapantsios, T.D. 2013, "Towards a wicking rapid test for rejection assessment of reused fried oils: Results and analysis for extra virgin olive oil", *Journal of Food Engineering*, 119, pp. 260-270.
12. Lioumbas, J.S., Krause, J. & Karapantsios, T.D. 2013, "Hypergravity to explore the role of buoyancy in boiling in porous media", *Microgravity Science and Technology*, vol. 25, no. 1, pp. 17-25.
13. Lioumbas, J.S., Ampatzidis, C. & Karapantsios, T.D. 2012, "Effect of potato deep-fat frying conditions on temperature dependence of olive oil and palm oil viscosity", *Journal of Food Engineering*, vol. 113, no. 2, pp. 217-225.
14. Lioumbas, J.S. & Karapantsios, T.D. 2012, "Effect of Potato Orientation on Evaporation Front Propagation and Crust Thickness Evolution during Deep-Fat Frying", *Journal of Food Science*, vol. 77, no. 10, pp. E297-E305.
15. Lioumbas, J.S. & Karapantsios, T.D. 2012, "Evaporation front compared with crust thickness in potato deep-fat frying", *Journal of Food Science*, vol. 77, no. 1, pp. E17-E25.
16. Lioumbas, J.S., Kostoglou, M. & Karapantsios, T.D. 2012, "On the capacity of a crust-core model to describe potato deep-fat frying", *Food Research International*, vol. 46, no. 1, pp. 185-193.
17. Lioumbas, J.S., Kostoglou, M. & Karapantsios, T.D. 2012, "Surface water evaporation and energy components analysis during potato deep fat frying", *Food Research International*, vol. 48, no. 1, pp. 307-315.
18. Kakosimos, K., Assael, M.J., Lioumbas, J.S. & Spyridis A.S. 2011, "Atmospheric dispersion modelling of the fugitive particulate matter from overburden dumps with Numerical and Integral Models", *Atmospheric Pollution Research*, 2, 24-33.
19. Lioumbas, J.S., Kolimenos, C. & Paras, S.V. 2009, "Liquid layer characteristics in gas-liquid flow in slightly inclined pipes: Effect of non-ionic surfactant additives", *Chemical Engineering Science*, vol. 64, no. 24, pp. 5162-5172.

20. Lioumbas, J.S., Mouza, A.A., Paras, S.V. & Karabelas, A.J. 2007, "Liquid layer characteristics in stratified gas-liquid downflow: A study of transition to wavy flow", *Heat Transfer Engineering*, vol. 28, no. 7, pp. 625-632.
21. Lioumbas, J.S., Mouza, A.A. & Paras, S.V. 2006, "Effect of surfactant additives on co-current gas-liquid downflow", *Chemical Engineering Science*, vol. 61, no. 14, pp. 4605-4616.
22. Lioumbas, J.S., Paras, S.V. & Karabelas, A.J. 2005, "Co-current stratified gas-liquid downflow-Influence of the liquid flow field on interfacial structure", *International Journal of Multiphase Flow*, vol. 31, no. 8, pp. 869-896.
23. Lioumbas, I.S., Mouza, A.A. & Paras, S.V. 2002, "Local velocities inside the gas phase during counter-current two-phase flow in a narrow vertical channel", *Chemical Engineering Research and Design*, vol. 80, no. 6, pp. 667-673.

Conference Proceedings

1. Lioumbas, J.S., Chatzidafni, A. & Paras, S.V. 2006, "Liquid layer characteristics in gas-liquid upflow in slightly inclined pipes: Effect of surfactant additives", CHISA 2006 - 17th International Congress of Chemical and Process Engineering.
2. Lioumbas, J.S. & Paras, S.V. 2006, "Effect of physical properties on co-current gas-liquid stratified downflow", CHISA 2006 - 17th International Congress of Chemical and Process Engineering.
3. Lioumbas, J.S., Paras, S.V. 2005 Effect of surfactant additives on liquid flow-field interaction with the interfacial structure in co-current stratified gas-liquid downflow. 3rd Intern. Workshop on Transport Phenomena with Moving Boundaries, Berlin, Germany.
4. Lioumbas, J., Nydal, O.J., Paras, S.V. 2004 Study of free falling liquid layer in inclined pipes: effect of diameter and inclination angle. 3rd Inter. Symposium on Two-Phase Flow Modeling and Experimentation, Pisa, Italy, pp. IV-2177.

Presentations (Talks & Posters)

5. M. C. Vlachou, J. S. Lioumbas, T. D. Karapantsios, "Flow boiling incipience in macro-channels: Working conditions that maximize heat removal" Smart and Green Interfaces Conference & COST MP1106 Annual meeting, Athens, Greece, May 4-6 (2016).
6. M. C. Vlachou, J. S. Lioumbas, T. D. Karapantsios, "Highly subcooled flow boiling in macro-channels: Effect of channel's height and orientation" poster, Smart and Green Interfaces Conference & COST MP1106 Annual meeting, Athens, Greece, May 4-6 (2016).
7. M. C. Vlachou, J. S. Lioumbas, C. David, T. D. Karapantsios, "Subcooled flow boiling in a rectangular macro-channel at high mass flow rates: Performance of horizontal and vertical orientation", poster & short oral, International Symposium and School for Young Scientists Interfacial Phenomena and Heat Transfer, Novosibirsk, Russia, March 2-4 (2016).
8. Lioumbas, A. Zamanis, G. Loywick, B. Brut-Cottan and T.D. Karapantsios, Effect of substrate topology on capillary rise in porous media, Smart and Green Interfaces Conference , 30. March-01. April 2015, Belgrade, Serbia.
9. M. C. Vlachou, J. S. Lioumbas, C. N. David, D. Chasapis, T. D. Karapantsios, "Heat transfer characteristics during subcooled flow boiling: Influence of inclination angle" oral, 6th International Conference on Bubble and Drop interfaces, Potsdam-Golm, Germany, July 6-10 (2015).
10. M. C. Vlachou, J. S. Lioumbas, T. D. Karapantsios, Flow boiling heat transfer as means of cooling in a rectangular macrochannel, Smart and Green Interfaces Conference , 30. March-01. April 2015, Belgrade, Serbia.
11. Vlachou M. C., Lioumbas J. S., David C. N., Chasapis D., Karapantsios T. D., Heat Transfer Characteristics During Subcooled Flow Boiling: Influence of Channel Inclination Angle, 6th Bubble and drop interfaces 6-10 July 2015, Potsdam-Golm Germany.
12. Lioumbas, J.S., E, Georgiou and Karapantsios, T.D. 2014 SURFACE SHEAR VISCOSITY IN FOAM FREE DRAINAGE: GLOBAL VS LOCAL MEASUREMENTS, EUFOAM, 7-10 July, Thessaloniki, Greece.
13. Lioumbas, J.S. and Karapantsios, T.D. 2014 INFLUENCE OF GRAVITY LEVEL TO OIL/VAPOUR FOAM STABILITY DURING FRYING, EUFOAM, 7-10 July, Thessaloniki, Greece.

14. Kostoglou, M., Lioumbas, J.S. and Karapantsios, T.D. 2014 INVERSE POPULATION BALANCE TREATMENT OF BUBBLE COALESCENCE IN FOAMS, EUFOAM, 7-10 July, Thessaloniki, Greece.
15. Lioumbas, J.S. and Karapantsios, T.D. 2014 Bubble dynamics and substrate thermalization during boiling in water saturated porous medium, Heat Transfer and Fluid Flow in Microscale V, 22-26 April, Marseilles, France.
16. Lioumbas, J.S. and Karapantsios, T.D. 2014 Capillary rise in porous media to set rejection criteria for reused fried oils, Smart and Green Interfaces Conference – COST MP1106, Marseille – April 22nd to 24th.
17. Vlachou, M., Lioumbas, J.S. and Karapantsios, T.D. 2014 Device for the study of highly efficient flow boiling heat transfer in a macro-channel, Smart and Green Interfaces Conference – COST MP1106, Marseille – April 22nd to 24th.
18. Lioumbas, J.S. and Karapantsios, T.D. 2013 Effect of gravity on heat and mass transfer phenomena during immersion of a water saturated porous matrix in hot oil, Smart and Green Interfaces Workshop, Prague, Czech Republic.
19. Lioumbas, J.S., Lestos, N. and Karapantsios, T.D. 2013 Effect of thermal gradients on heat and mass transfer phenomena during the immersion of a water saturated porous matrix in hot oil, Smart and Green Interfaces Workshop, Prague, Czech Republic.
20. Lioumbas, J.S. Krause, J., Toth, B., and Karapantsios, T.D. 2012 Boiling over water saturated porous matrix submerged in hot oil – Influence of hypergravity, ECI-8TH Lausanne, 3-7 June, 2012.
21. Lioumbas, J.S. and Karapantsios, T.D. 2012 Boiling over water saturated porous matrix submerged in hot oil - Influence of oil temperature, ECI-8TH Lausanne, 3-7 June, 2012.
22. Lioumbas, J.S. and Karapantsios, T.D. 2012 Triggerring buoyancy in boiling over porous media, 5th International Workshop on Bubble and Drop Interfaces 2012, 20- 24 May Krakow, Poland.
23. Lioumbas, J.S., Krause, J. and Karapantsios, T. 2011 Hypergravity to explore the role of buoyancy in boiling in porous media, ELGRA Biennial Symposium, Antwerp, Belgium.
24. Lioumbas, J.S., Kostoglou, M. and Karapantsios, T. 2011 Transient mass and heat transfer during potato deep fat frying – The effect of the oil type, frying load and initial frying temperature, 11th International Congress on Engineering and Food, Athens, Greece.
25. Lioumbas, J.S. and Karapantsios, T. 2011 Potato deep-fat frying. The role of buoyancy on heat and mass transfer phenomena, 11th International Congress on Engineering and Food, Athens, Greece.
26. Hatzidafni A., Evgenidis S., Lioumbas I., Karapantsios T.D., “Electrical resistance tomography in upward co-current bubbly flow”, 4th International Workshop Bubble and Drop Interfaces, B&D2009, jointly organized with COST P21 8th Management Committee and Working Groups, September 23-25, 2009, Thessaloniki, Greece.
27. Kakosimos, E.K, Assael, M.J., Lioumbas, J.S. and Spiridis, A.S. 2008 Atmospheric dispersion modeling of particulate matter from overburden dumps: the case of Amynaion’s mines, 6th GRA CM International Congress on Computational Mechanics, Thessaloniki, Greece.
28. Lioumbas, J.S., Mouza, A.A., Paras, S.V., Karabelas, A.J. 2005 Liquid layer characteristics in stratified gas-liquid downflow: A study of transition to wavy flow. 4th International Conference on Heat Transfer, Fluid Mechanics & Thermodynamics, Cairo, Egypt.
29. Lioumbas, J., Nydal, O.J., Paras, S.V. 2003 “Study of thin liquid layers”, Workshop of the Norwegian Multiphase Flow Group, Hitra, Norway.

SELECTED PRESS

1. “Astronaut Need Inspires Crispier French Fries”, Scope, MIT Graduate Program in Science Writing, Nov. 2012.
2. “French Fries in Space”, To Vima Science, Mar. 2013.
(<http://www.tovima.gr/science/article/?aid=496284>).
3. <http://www.bbc.com/future/story/20131219-can-astronauts-cook-fries>
4. <http://www.thetimes.co.uk/tto/news/uk/article3963344.ece+&cd=6&hl=en&ct=clnk&gl=gr>
5. <http://www.foodproductiondaily.com/Innovations/Fish-Chips-anyone-ESA-cooks-fries-in-space>
6. <http://gizmodo.com/sorry-astronauts-its-impossible-to-fry-food-in-zero-1490374837>
7. <http://www.eejournal.com/archives/fresh-bytes/science-says-jupiter-has-the-best-french-fries/>

8. <http://www.dailymail.co.uk/sciencetech/article-2521450/Scientists-cook-chips-anti-gravity-cosmonauts-dont-miss-snack-space.html>
9. <http://news.sciencemag.org/physics/2013/12/scienceshot-french-fries-jupiter>
10. http://www.huffingtonpost.com/2014/01/02/french-fries-jupiter-european-space-agency_n_4531906.html
11. http://www.repubblica.it/scienze/2014/01/01/news/patate_fritte_giove-74902247/