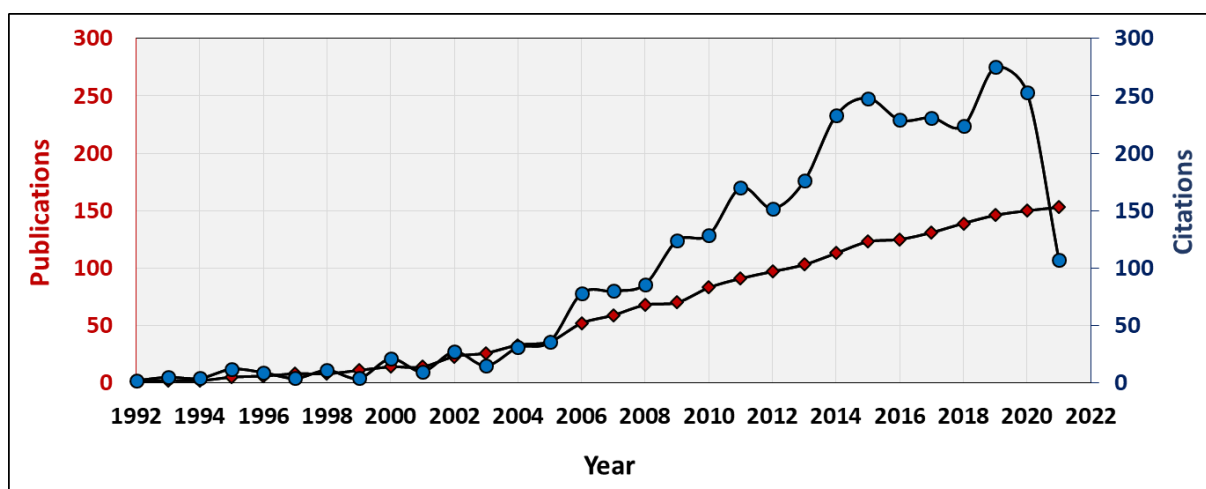


## Professor Theodoros Karapantsios

Prof. Theodoros Karapantsios has dedicated the last twenty years of his career in both doing and supervising research, in the field of chemical engineering. His main scientific interests are listed below:

- ☐ Intensification of heat exchange processes (boiling, condensation, evaporation, frying).
- ☐ Hydrodynamics & bubble dynamics in two phase flows (liquid degassing, bubble columns).
- ☐ Dynamics of multiphase systems: Bubble-bubble, bubble-particle interactions in mineral flotation systems.
- ☐ Stability enhancement and rheological behavior of emulsions and foams (food, cosmetics, detergents).
- ☐ Wettability of solid surfaces (upon treatment with biofilms, coatings, dyes), under normal and external body forces.
- ☐ Biofilms development and characterization (chemical, morphological, wetting).
- ☐ Rheological and physicochemical characterization of gas/liquid, liquid/liquid interfaces and thin liquid bridge.
- ☐ Water and wastewater quality control. Development of relevant treatment technologies.
- ☐ Development of innovative electrical, optical, wetting and acoustic measuring techniques.
- ☐ Development of medical diagnostic devices for assessment of blood circulation in the human body (diagnosis of Coronary Artery Disease and Decompression Sickness).
- ☐ Dynamics and rationalization of viral shedding in wastewater and sewerage piping networks.

Prof. Karapantsios has more than 160 publications in international scientific journals, he participated in more than 250 scientific conferences and he is the owner of 6 patents. During his academic career, he supervised 14 PhD and several more master and undergraduate theses. Moreover, he has coordinated/participated in more than 85 research projects. The research activity of Prof. Karapantsios as indicated by “Scopus” data base, is shown in the following graph.



### 1. Education

- 1987: Bachelor Degree in Chemical Engineering, Aristotle University of Thessaloniki, Greece.
- 1989: Master Degree in Chemical Engineering, University of Rochester, U.S.A.
- 1993: PhD Degree in Chemical Engineering, Aristotle University of Thessaloniki, Greece.

### 2. Academic Career

- 2015 – έως σήμερα: Professor, School of Chemistry, Aristotle University of Thessaloniki, Greece.
- 2010 – 2015: Associate Professor, School of Chemistry, Aristotle University of Thessaloniki, Greece.
- 2005 – 2010: Assistant, School of Chemistry, Aristotle University of Thessaloniki, Greece.
- 2001 – 2005: Lecturer, School of Chemistry, Aristotle University of Thessaloniki, Greece.
- 1995 – 2004: Research Associate, Department of Food Technology, A.T.E.I. of Thessaloniki, Greece.

- 1995 – 2001: Guest Associate Professor, Department of Mechanical Engineering, University of Thessaly, Greece.
- 1995 – 2001: Research Associate, Department of Mechanical Engineering, T.E.I. of Central Macedonia, Serres, Greece.
- 1994 – 1995: Postdoctoral Researcher, Van der Waals-Zeeman Lab, University of Amsterdam, Netherlands.

### 3. Recent publications in international scientific journals

- Chondrou A., Karapantsios T.D., Kostoglou M., “Effect of width/height of the gap between piston and wall on the performance of a novel small volume emulsification device”, *Colloids and Surfaces A: Physicochemical & Engineering Aspects*, 2021, to be published.
- Kosheleva R.I., Karapantsios T.D., Kostoglou M., Mitropoulos A.C., “A novel device for in situ study of gas adsorption under rotation”, *Review of Scientific Instruments*, 92(4), 045106, 2021.
- Petala M., Dafou D., Kostoglou M., Karapantsios T.D., Kanata E., Chatziefstathiou A., Sakaveli F., Kotoulas K., Arsenakis M., Roilides E., Sklaviadis T., Metallidis S., Papa A., Stylianidis E., Papadopoulos A., Papaioannou N., “A physicochemical model for rationalizing SARS-CoV-2 concentration in sewage. Case study: The city of Thessaloniki in Greece”, *Science of the Total Environment*, 755, 142855, 2021.
- Kostoglou M., Karapantsios T.D., Evgenidis S.P., “On a generalized framework for turbulent collision frequency models in flotation: The road from past inconsistencies to a concise algebraic expression for fine particles” *Advances in Colloid and Interface Science*, 284, 102270, 2020.
- Gkotsis P.K., Evgenidis S.P., Karapantsios T.D., “Associating void fraction signals with bubble clusters features in co-current, upward gas-liquid flow of a non-Newtonian liquid”, *International Journal of Multiphase Flow*, 131, 103297, 2020.
- Recupido F., Toscano G., Tatè R., Petala M., Caserta S., Karapantsios T.D., Guido S., “The role of flow in bacterial biofilm morphology and wetting properties”, *Colloids and Surfaces B: Biointerfaces*, 192, 111047, 2020.
- Gkotsis P.K., Evgenidis S.P., Karapantsios T.D., “Influence of Newtonian and non-Newtonian fluid behaviour on void fraction and bubble size for a gas-liquid flow of sub-millimeter bubbles at low void fractions”, *Experimental Thermal and Fluid Science*, 109, 109912, 2019.
- Vlachou M.C., Efstathiou C., Antoniadis A., Karapantsios T.D., “Micro-grooved surfaces to enhance flow boiling in a macro-channel”, *Experimental Thermal and Fluid Science*, 108, 61–74, 2019.
- Ríos-López I., Petala M., Kostoglou M., Karapantsios T.D., “Sessile droplets shape response to complex body forces”, *Colloids and Surfaces A: Physicochemical and Engineering Aspects*, 572, 97–106, 2019.
- Oikonomidou O., Evgenidis S.P., Schwarz C.J., van Loon J.J.W.A., Kostoglou M., Karapantsios T.D., “Degassing of a decompressed flowing liquid under hypergravity conditions”, *International Journal of Multiphase Flow*, 115, 126–136, 2019.
- Vlachou M., Lioumbas J., Kostoglou M., David K., Chasapis D., Schwarz C., van Loon J.J.W.A., Karapantsios T.D., “Subcooled flow boiling in horizontal and vertical macro-channel under Earth-gravity and hyper-gravity conditions”, *International Journal of Heat and Mass Transfer*, 133, 36–51, 2019.
- Evgenidis S.P., Karapantsios T.D., “Gas-liquid flow of sub-millimeter bubbles at low void fractions: Void fraction prediction using drift-flux model”, *Experimental Thermal and Fluid Science*, 98, 195–205, 2018.
- Ríos-López I., Evgenidis S.P., Kostoglou M., Zabulis X., Karapantsios T.D., “Effect of initial droplet shape on the tangential force required for spreading and sliding along a solid surface”, *Colloids and Surfaces A: Physicochemical and Engineering Aspects*, 549, 164–173, 2018.
- Giakisikli G., Trikas E., Petala M., Karapantsios T.D., Zachariadis G., Anthemidis A., “An integrated sequential injection analysis system for ammonium determination in recycled hygiene and potable water samples for future use in manned space missions”, *Microchemical Journal*, 133, 490–495, 2017.

- Evgenidis S.P., Kalić K., Kostoglou M., Karapantsios T.D., “Kerberos: A three camera headed centrifugal/tilting device for studying wetting/dewetting under the influence of controlled body forces”, *Colloids and Surfaces A: Physicochemical and Engineering Aspects*, 521, 38–48, 2017.

#### 4. Scientific monographs and translations

- Karapantsios T.D., “Conductive drying kinetics of pregelatinized starch thin films”, *J. Food Eng.*, 76, 477-489, 2006.
- Karapantsios T.D., Loukidou M.X. and Matis K.A., “Sorption kinetics”, *Oceanography; Meteorology; Physics and Chemistry; Water Law; and Water History, Art and Culture*, *Water Encyclopedia*, J. Lehr, editor-in-chief, vol. 4, pp. 564-569, Wiley, Hoboken, N.J., 2005.

#### 5. Patents

- Karapantsios T.D., Kostoglou M., Evgenidis S.P., Zamanis A., “A novel method for the determination of two fluids’ interfacial tension and the study of liquid/liquid and liquid/gas interface stability”, Hellenic Industrial Property Organisation, Patent Application No. GR20200100562, 16-09-2020.
- Karapantsios T.D., Evgenidis S.P., Zacharias K., Karagiannis G., “Non-invasive impedance spectroscopy device for early diagnosis of Coronary Artery Disease and method therefor”, European Patent Office, EP 3245947 A1, 2017.
- Karapantsios T.D., Evgenidis S.P., Zacharias K., Karagiannis G., “Innovative, non-invasive electrical impedance spectroscopy technique for prompt diagnosis of Coronary Artery Disease”, Hellenic Industrial Property Organisation, 1009123, 2016.
- Karapantsios T.D., Evgenidis S.P., Zacharias K., Mesimeris T., “Method for the detection and characterization of bubbles in liquids and device therefor, resp. system”, European Patent Office, 3005942 A1, 2016.
- Lioumbas J., Zamanis A., Karapantsios, T.D., “Rapid test for rejection of used oil by employing wicking in porous media”, Greek Patent Office, Patent Number 20140100445, 2014.

#### 6. Oral presentations in international scientific conferences and schools

- Recupido F., Petala M., Kostoglou M., Caserta S., Guido S., Karapantsios T.D., “Wetting properties of biofilms produced under well controlled shear flow conditions”, Biofilm9 (virtual) conference, Karlsruhe Institute of Technology (KIT), Germany, 29th September-1st October 2020. ORAL
- Karapantsios T.D., “Technology Development for Space Applications. The experimental work of Multiphase Dynamics Group (Chemistry Department, A.U.Th.)”, 3rd Chemistry Conference of Graduate & Undergraduate Students, Thessaloniki, Greece, November 22-23, 2019. ORAL
- Oikonomidou O., Evgenidis S., Schwarz C.J., van Loon J. J.W.A., Kostoglou M., Karapantsios T.D., “Bubbles forming under hypergravity accelerations due to the degassing of a liquid jet”, 26<sup>th</sup> ELGRA Symposium and General Assembly, Granada, Spain, September 24-27, 2019. ORAL
- Rios-Lopez I., Evgenidis S.P., Kostoglou M., Karapantsios T.D., “Droplet spreading & sliding on solid substrates under controlled body forces”, 8<sup>th</sup> Conference: Bubble and Drop, Sofia, Bulgaria, June 24-28, 2019. ORAL
- Argyropoulos C., Kostoglou M., Karapantsios T.D., “Experimental study of heat transfer and bubble dynamics during flow boiling at porous – coated surfaces. The role of pressure fluctuations”, 8th Conference: Bubble and Drop, Sofia, Bulgaria, June 24-28, 2019. ORAL
- Evgenidis S.P., Zacharias K., Karapantsios T.D., “In-Vivo Embolic Detector (I-VED): Technology for bubbles detection in living subjects”, Invited Research Seminar, Joint Department of Biomedical Engineering-UNC Chapel Hill & NC State University, February 4, 2019. ORAL
- Lioumbas J.S., Vlachou M.C., Oikonomidou O., Karapantsios T.D., “LDC as a tool to explore the role of buoyancy in bubbles related applications”, Hypergravity Workshop, ESA-ESTEC, Noordwijk, The Netherlands, January 25 – 26, 2018. ORAL
- Lioumbas J.S., Vlachou M.C., Oikonomidou O., Karapantsios T.D., “LDC as a tool to explore the role of buoyancy in bubbles related applications”, Hypergravity Workshop, ESA-ESTEC, Noordwijk, The Netherlands, January 25 – 26, 2018. ORAL

- Recupido F., Villano D., Toscano G., Tatè R., Petala M., Caserta S., Guido S., Karapantsios T.D., “Effect of Flow on Biofilm Formation and Morphology and Wetting Properties of *Pseudomonas fluorescens* Biofilms”, 1st Joint AgroSpace-MELiSSA Workshop, Rome, Italy, May 16-18, 2018. ORAL
- Rios-Lopez I., Evgenidis S., Kostoglou M., Zabulis X., Karapantsios T.D., “KERBEROS: An innovative device for studying wetting/spreading/sliding under controlled body forces”, 7th International Workshop Bubble and Drop Interfaces, B&D2017, June 26-30, 2017, Lyon, France KEYNOTE.
- Evgenidis S. P., Zacharias K., Mesimeris A., Karapantsios T.D., Mesimeris T., Karagiannis G., Stefanidou S., Kotsiou M., “In-Vivo Embolic Detector (I-VED): Research advancements on bubbles detection in living subjects“, Smart and Green Interfaces 2015 Conference jointly organized with COST MP1106 Annual Workshop, Belgrade, Serbia, March 30-April 1, 2015. ORAL

## **7. Research campaigns**

- European Space Agency parabolic flight campaigns in 1997, 1998, 1999, 2003, 2004, 2008, 2009, 2013, 2014, 2016, 2017.
- European Space Agency hypergravity campaigns in 2013, 2015, 2017.

## **8. Organizing international scientific conferences (head or member of organizing committee)**

- Member of Science committee, IPHT2017, Xian, May, 2017.
- Member of Bubbles & droplets 2017 steering committee, Lyon, 2017.
- “Smart and Green Interfaces 2016”, Athens, Greece, May 04 - 06, 2016 (President).
- Member of Science committee, IPHT2016, Novosibirsk, March, 2016.
- “22nd E.L.G.R.A. Symposium and General Assembly”, Corfu, Greece, September 29 – October 01, 2015 (President).
- “10th European Conference on Foams and Applications-EUFOAM 2014”, Thessaloniki, Greece, July 7-10, 2014 (President).
- “9th EUFOAM Conference”, Portugal, Lisbon, 8-11 July, 2012.
- “5th International workshop on Bubble and Drop Interfaces”, Cracow, Poland, 20-24 May, 2012.
- “11th International Congress on Engineering and Food”, Athens, Greece, 22-26, May, 2011.
- “8th EUFOAM Conference”, Bulgaria, Borovets, 13-16 July, 2010.
- “17th International Symposium on surfactants in solution (SIS2008)”, Berlin, August 17-22, 2008.
- “4th International Workshop”, Bubble and Drop Interfaces, Thessaloniki, Greece, 23-25 Sept, 2009 (President).
- “1st Training School of COST P21: The Physics of droplets on Physico-chemical and flow behavior of droplet based systems”, Capri, May 12-14, 2008.
- European Low Gravity Research Association (ELGRA) Biennial Meeting, Florence, Italy, 4-7 Sept., 2007.
- European Low Gravity Research Association (ELGRA) Biennial Meeting, Santorini, Greece, 21-23 Sept, 2005 (President).

## **9. Editorial board member of international scientific journals**

- Advances in Colloid and Interface Science, (Associate editor)
- Colloids Surfaces A: Physicochem. Eng. Aspect, Special issue B&D2009 Conference (guest editor)
- Microgravity Science & Technology, Special issue ELGRA 2005 Conference (guest editor)

## **10. Professional achievements**

- Vice President of Research Committee and Management of ELKE AUTH, 2021.
- Director of Chemical and Environmental Technology Lab, School of Chemistry, AUTH, 2020-2021.
- Coordinator of AUTH epidemiology group regarding the identification of SARS-CoV-2 viral load and mutations in Thessaloniki’s sewerage, March 2020.

- Coordinator of Work Group 4: Development & Sustainability of Research Infrastructures Committee, AUTH, 2019-2021.
- President of Interdepartmental Equipment Committee, AUTH, 2019-2021.
- Chairman of international conferences (ELGRA 2005; Bubble and Drop 2009, EUFOAM 2014, ELGRA 2015; Bubble and Drop 2019; 26th ELGRA Symposium and General Assembly) and member of the scientific committee of several others.
- Chair of COST action MP1106 in the domain of Materials, Physical and Nanosciences: Smart and green interfaces from single bubbles/drops to industrial, environmental and biomedical applications (European Cooperation in the Field of Scientific & Technical Research 2004), 2012-2016.
- Greek delegate in the European Space Agency Program Board on Human Spaceflight and Exploration (2010- present).
- Member of the Management Committee of the European Low Gravity Research Association since 1999, General Secretary 2005-2007 and Vice-President 2007-2009.
- Greek delegate in the Management Committee of Domain “Cooperation-Space” in European Union FP6 (2004-2006) and FP7 (2006-present).
- Member of nine (9) European Space Agency Topical Teams since 1996.

#### **11. Distinctions**

- Evgenidis S., Zacharias K., Karagiannis G., Karapantsios T.D.: Top 100 Entry in the “Create the Future 2017 Design Contest” among 1100 innovative engineering products from 60 countries, organized by Tech Briefs Media Group (publisher of NASA Tech Briefs and Aerospace & Defense Technology), for “Portable and Non-Invasive Electrical Device for the Diagnosis of Coronary Artery Disease (Cor-IS)”, 11 November, 2017.
- Karapantsios T.D., Award of Excellence from Aristotle University of Thessaloniki, 2015.

#### **12. Supporting early stage researchers**

- Complex Wetting Phenomena (CoWet), Marie-Curie Initial Training Network, GA No 607861, 67985/2013, 2014-2017).
- Smart and green interfaces: from single bubbles/drops to industrial/environmental/biomedical applications (ESF/COST Action CGA-MP1106/2012-2016).

#### **13. Development of innovative bioengineering prototypes**

- Novel electrical impedance spectroscopy device for Decompression Sickness diagnosis
- Portable, electrical impedance medical tool for early diagnosis of Coronary Artery Disease
- Space Fryer: Coriolis force frying device

#### **14. Coordinator/ partner in funded research projects**

- Innovative technologies and concepts for fine particle flotation: unlocking future fine-grained deposits and Critical Raw Materials resources for the EU (FineFuture), European Union’s Horizon 2020, GA No 821265, June 2019-June 2022.
- \*Stavros Niarchos Foundation (SNF) Scholarship (beneficiary: S. Evgenidis) for “Electrical Impedance Spectroscopy device for the diagnosis of Coronary Artery Disease (Cor-IS)”, Eastern Macedonia and Thrace Institute of Technology (EMaTTech), October 2016 – September 2018.
- \* Soft-Matter Dynamics, (ESA-MAP, 4000115113/15/NL/PG, ELIPS-4), 2016-2018
- \* Multiscale analysis of Boiling. (ESA-AO-2004-PCP-111/ELIPS-2, CCN2 4200020289, 49574/22-07-2011, 2015-2016)
- \*On-Line Ammonium Analyzer for water recycling systems, (ESA, TRP, AO/1-8029/14/NL/SFe), 2015-2016.
- Complex Wetting Phenomena (CoWet), Marie-Curie Initial Training Network, GA No 607861, 67985/2013, 2014-2017).
- \*Biocide management for long term water storage (ESA, TRP, 4000109529/13/NL/CP, 118993/2013, 2014-2015).

- \*Bubble Dynamics During Degassing of Liquids (ESA, NPI 4000108790/13/NL/PA, 87132/2013, 2013-2016).
- Enhanced condensers for microgravity (ENCOM), (ESA CCN2 to contract No. 4200020276, 110164/2012, 2011-2014).
- \*.Smart and green interfaces: from single bubbles/drops to industrial/environmental/biomedical applications (ESF/COST Action CGA-MP1106-1st year, 61372/2012, 2012-2013).
- \*Highly efficient flow boiling in macro-structured / macro-porous channels (ESA, NPI 4000106405/12/NL/PA, PFL-PTM/PA/gm/364.2012, 80775/2012, 2012-2015).
- \*Influence of gravity conditions on mass and heat transfer in porous media (ESA TRP, 22470/09/NL/CBi, 2009-2011).
- \*In-Vivo Embolic Detector-Phase I - IVa, (ESA GSTP CCN2 4000101764/10/NL/SFe, 41027/2013, 2013; ESA GSTP C4000101764/10/NL/SFe, 2010-2012; ESA GSTP CCN/6-18354/05/NL/PA, 2009-2010; ESA GSTP CCN/3-18354/05/NL/PA, 2006-2007; ESA GSTP RFQ/3-10938/04/NL/PA, 2004-2005.)
- \*Development of an electrical technique for the detection and characterization of bubbles in bubbly liquid flows. (Greek Ministry of Education & EuroDiving Trading Inc., PENED 2003, 03ED376/3403/19-01-2006, 2006-2009).