

Curriculum Vitae

Personal Information:

School of Mineral Resources Engineering
Technical University of Crete
Akrotiri Chania 73100, Crete, Greece.

E-mail: eaioniou@isc.tuc.gr,
elef23@gmail.com
Tel: (+30) 28210-37692 (work),
(+30) 6932355099 (cell)

First Name, Family Name: **ELEFThERIA ANTONIOU, PhD**

Education:

- **Ph.D. in Chemical Engineering (2008)**, University at Buffalo, The State University of New York, Buffalo, NY, USA, PhD Supervisor: Professor Paschalis Alexandridis, Structure-Property Relationships in Associating Polymer Solutions
- **MEng in Chemical Engineering (2004)**, University at Buffalo, The State University of New York, Buffalo, NY, USA, Supervisor: Professor Paschalis Alexandridis
- **Diploma in Chemical Engineering (2001)**, National Technical University of Athens, Greece, Thesis Supervisor: Professor Nikolaos Markatos, Development of a New Equilibrium Model for the Solubility of H₂S or/and CO₂ in Aqueous Methyl-diethanolamine (MDEA) Solutions

Fellowships/Prizes/Awards:

2019 Excellence Research Grant (€120k); Hellenic Foundation for Research and Innovation (EΛIΔEK); “DEEPSEA - Bioremediation of hydrocarbon releases in deep sea” – project number 1510 – Role: Lead PI.

2016-2018, Research Scholar, **Grant Fellowship** "Assisting young scientists in prototyping innovative products by using cutting-edge technology", Stavros Niarchos Foundation (SNF) - International Hellenic University (**previously:** Technological Educational Institute of Eastern Macedonia and Thrace), "Biosurfactant production from marine hydrocarbon-degrading bacteria for combating oil spills" – Role: Lead PI

2016, **Award** for the idea "BioSurfer", Stavros Niarchos Foundation (SNF) - Technological Educational Institute of Eastern Macedonia and Thrace

2005, “Graduate Student **Excellence in Teaching Award**”, University at Buffalo

2006, Mark Diamond **Research Fund** (MDRF) Grant, Graduate Student Association, University at Buffalo

2006, **Conference Grant**, Graduate Student Association, University at Buffalo

2004, **Travel Grant**, NIST/NSF Center for High Resolution Neutron Scattering (CHRNS)

Current Position:

2021- to date, Laboratory Teaching Staff (LTS), Laboratory of PVT and Core Analysis, School of Mineral Resources Engineering, Technical University of Crete, Greece.

2019-2022, Independent Research Fellow, School of Environmental Engineering, Technical University of Crete, Greece, funded by the Hellenic Foundation for Research and Innovation (HFRI) “DEEPSEA”.

Previous Positions:

2013-2021, *Technical University of Crete*, School of Environmental Engineering, , Post-Doctoral Researcher

2010-2013, *Technical University of Crete*, School of Mineral Resources Engineering, Adjunct Lecturer/Researcher

2008–2010, *Foundation for Research and Technology Hellas (FO.R.T.H.)*, Polymer Group, Institute for Electronic Structure and Laser: Postdoctoral Researcher

2004-2008, *Research Foundation, University at Buffalo, The State University of New York, Buffalo, NY*: Research Assistant

2002-2008, *Department of Chemical & Biological Engineering, University at Buffalo, The State University of New York, Buffalo, NY*: Teaching Assistant

Sept. 2001 - June 2002, *Kalipsis*: Administrative Software Officer

Summer 1999, *Asprofos Engineering* (A "Hellenic Petroleum" Company): Intern

Summer 1998, "Kyknos" Food processing Company: Trainee Engineer

Summer 1997, "Ukrnafta" Central Research Laboratory, Ivano-Frankivsk, Ukraine: Trainee Engineer

Supervision of graduate students and postdoctoral fellows: 10 students and graduate students, 2010-2016, Technical University of Crete

5 undergraduate students, 2005-2008, University at Buffalo, The State University of New York

Research Experience

Technical University of Crete, School of Environmental Engineering, Biochemical Engineering and Environmental Biotechnology Laboratory (BEEB)

- Bioremediation of hydrocarbon releases in deep sea - DEEPSEA
- Biosurfactant production from marine hydrocarbon-degrading bacteria for combating oil spills - BioSurfer
- In situ oil burning as a mitigation tool for marine oil-spills in terms of toxicity to the marine environment, a mesocosm experiment, funded by the European Union and codenamed as "BurnImpact"
- Production (using marine bacterial), isolation (extraction), and characterization (TLC, FTIR, LC-MS) of biosurfactants
- Oil biodegradation enhancement in the sea with the use of bacterial biofilm

Technical University of Crete, School of Mineral Resources Engineering, Hydrocarbons Chemistry and Technology Research Unit

- Optimization of Light Cycle Oil (LCO) using Solvent Extraction as affected by Temperature and Solvent to Feed Ratio
- Chemical Analysis of Petroleum fractions: Open Column Chromatography (OCC), Gas & Liquid Chromatography (GC, HPLC), Infrared Spectroscopy with Fourier transform (FTIR)
- Upgrade process optimization of used lubricating oils with catalytic hydrogen-treatment

Foundation for Research and Technology, HELLAS (FO.R.T.H.), Institute of Electronic Structure and Laser (I.E.S.L.) -Polymer Group

Dynamics of Soft-Colloids

- Depletion effect studies of star - linear polymer blends using light scattering
- Polymer/inorganic nanocomposites characterization in organic solvents
- Interfacial Rheology, Langmuir Isotherms

University at Buffalo, The State University of New York, Department of Chemical and Biological Engineering

Structure-property relationships in polymer solutions

- Investigated using rheological measurements solution properties of polysaccharides (structure, association, newtonian fluids) as affected by temperature, solvent quality, and polymer molecular weight.

Interactions between solvent, polymer, protein and/or surfactant molecules in aqueous solution

- Studied surfactant self-assembly as affected by the presence of cyclodextrins, which have the ability to complex with part of the surfactant.
- Examined polymer-protein interactions using the small angle neutron scattering (SANS) technique to obtain nanostructure information.

Thermodynamics and structure in solutions containing polymers and/or surfactants

- Used Light Scattering and Vapor Pressure Osmometer to obtain structural properties.
- Determined the surface energy properties of various liquids using contact angle measurements.

Research management

- Supervised the work of four undergraduate researchers.
- Provided lab training to new undergraduate and graduate students.
- Laboratory Safety Coordinator.

National Technical University of Athens, Greece, Department of Chemical Engineering
Senior-year diploma thesis:

- Modeled the equilibrium of a gas absorption column used to purify refinery toxic gases in the framework of a joined-project between the university and Asprofos Engineering S. A. The column used MDEA to absorb H₂S or/and CO₂ in its different stages. Experimental data from the literature were modeled to conclude in a general equation that described the solubility of H₂S or/and CO₂ in aqueous MDEA solutions.

Teaching Activities:

Adjunct Lecturer, School of Mineral Resources Engineering, Technical University of Crete, Greece

Unit Operations (Spring '10, '11, '12, '13, teaching & Lab session)

Fossil Fuels (Fall '10, '11, '12, teaching & Lab session)

Organic Geochemistry (Spring '10, '11, '12, teaching & Lab session)

Teaching Assistant, Department of Chemical & Biological Engineering, University at Buffalo, The State University of New York, USA

MAE 204, Thermodynamics (Fall '07, Summer '05, '06, '07)

CE 457/527 Colloid & Surface Phenomena (Spring '05, '06)

CE 212, Introduction to Chemical Engineering (Fall '02, '03, '04, '05)

CE 304, Chemical Engineering Thermodynamics (Spring '03)

WORKSHOPS

September 2009, 12th European School on Rheology, Laboratory of Applied Rheology and Polymer Processing of the Katholieke Universiteit Leuven, Leuven, Belgium

September 2008, Neutron Scattering – Laboratory Course, Jülich, Germany

PUBLICATIONS (in peer reviewed Journals)

Mandalenaki, A.; Kalogerakis, N.; Antoniou, E. “Production of high purity bio-surfactants using heavy oil residues as carbon source” *Energies* 2021, submitted.

Charalambous, G.; Fragkou, E.; Kormas, K.A.; De Menezes, A.B.; Polymenakou, P.N.; Pasadakis, N.; Kalogerakis, N.; Antoniou, E.; Gontikaki, E. “Comparison of hydrocarbon-

Eleftheria Antoniou

degrading consortia from surface and deep waters of the Eastern Mediterranean Sea: characterization and degradation potential" *Energies*, 2021, 14(8), 2246; <https://doi.org/10.3390/en14082246>.

Antoniou, E.; Nikolopoulou, M.; Daskalakis, M.; Pasadakis, N.; Kalogerakis, N. "Emulating Deep-Sea Hydrocarbon Releases in a High Pressure Bioreactor: Challenges and Innovations" 40th AMOP Technical Seminar on Environmental Contamination and Response 2017, Alberta, Canada. (paper)

Antoniou, E.; Fodelianakis, S.; Korkakaki, E.; Kalogerakis, N. "Biosurfactant production from marine hydrocarbon-degrading consortia and pure bacterial strains using crude oil as carbon source" *Front. Microbiol.*, April 2015, (6), article 274.

Fodelianakis, S.; Antoniou, E.; Mapelli, F.; Magagnini, M.; Nikolopoulou, M.; Marasco, R.; Barbato, M.; Tsiola, A.; Tsikopoulou, I.; Giaccaglia, L.; Mahjoubi, M.; Jaouani, A.; Amer, R.; Hussein, E.; Al-Horani, F.; Benzha, F.; Blaghen, M.; Malkawi, H.; Abdel-Fattah, Y.; Cherif, A.; Daffonchio D.; Kalogerakis, N. "Allochthonous bioaugmentation in ex situ treatment of crude oil-polluted sediments in the presence of an effective degrading indigenous microbiome" *J. Hazard. Mater.* 2015, 287, 78-86.

Fajalia, A. I.; Antoniou, E.; Alexandridis, P.; Tsianou, M. "Self-assembly of Sodium Bis(2-ethylhexyl) Sulfosuccinate in Aqueous Solutions: Modulation of Micelle Structure and Interactions by Cyclodextrins Investigated by Small-Angle Neutron Scattering" *J. Mol. Liq.*, 2015, 210, 125-135.

Pasadakis, N.; Antoniou, E.; Karonis, D. Optimization of Light Cycle Oil (LCO) Solvent Extraction: Impact of Temperature and Solvent to Feed Ratio, *Petrol. Sci. & Tech.* 2014, 32:21, 2566-2574.

Antoniou, E.; Voudouris, P.; Larsen, A.; Loppinet, B.; Vlassopoulos, D. ; Pastoriza-Santos, I.; Liz-Marzan, L. M. "Static and Dynamic Plasmon-Enhanced Light Scattering from Dispersions of Polymer-Grafted Silver Nanoprisms in the Bulk and Near Solid Surfaces" *J. Phys. Chem. C* 2012, 116, 3888-3896.

Antoniou, E.; Tsianou, M. "Solution Properties of Dextran in Water and in Formamide" *J. Appl. Polym. Sci.* 2012, 125, 1681-1692.

Karonis, D.; Pasadakis, N.; Antoniou, E. "Light cycle oil solvent extraction optimization: Impact of solvent, temperature, and solvent to feed ratio variation" *Fuel Preprints 2011 (ACS Division of Fuel Chemistry)*.

Antoniou, E.; Themistou, E.; Sarkar, B.; Tsianou, M.; Alexandridis, P. "Structure and Dynamics of Dextran in Binary Mixtures of a Good and a Bad Solvent" *Colloid and Polymer Science* 2010, 288, 1301-1312.

Antoniou, E.; Buitrago C. F.; Tsianou, M.; Alexandridis, P. "Solvent Effects on Polysaccharide Conformation" *Carbohydr. Polym.* 2010, 79, 380-390.

Antoniou, E.; Alexandridis, P. "Polymer Conformation in Mixed Aqueous Polar Organic Solvents" *Eur. Polymer J.* 2010, 46, 324-335.

Antoniou, E.; Themistou, E.; Tsianou, M.; Alexandridis, P. "Polysaccharide solution properties modulated by solvent mixtures" *Polymer Preprints* 2008, 49(2), 665, 236th ACS National Meeting, Philadelphia, PA, United States, 2008.

Antoniou, E.; Tsianou, M.; Alexandridis, P. "Solvent Modulation of Polysaccharide Conformation" Extended Abstract, *AICHE 2008 Annual Meeting*, Philadelphia, Pennsylvania, United States, 2008, #443c - Self Assembly in Solution I. <http://www.nt.ntnu.no/users/skoge/prost/proceedings/aiche-2008/data/papers/P133290.pdf>

Antoniou, E.; Themistou, E.; Tsianou, M.; Alexandridis, P. "Solvent Effects on Polysaccharide Conformation" Extended Abstract, AIChE 2007 Annual Meeting, Salt Lake City, Utah, United States, 2007, #418c - Fundamentals of Interfacial Phenomena II.

Antoniou, E.; Tsianou, M.; Alexandridis, P. "Solution Properties of Polysaccharides in Water and Polar Organic Solvents" Polymer Preprints (ACS Division of Polymer Chemistry) 2005, 46(2), 532-533.

Alexandridis, P.; Tsianou, M.; Antoniou, E.; Katori, Y.; Singh, I.; Neelamegham, S. "Interactions between Fibrinogen and PEG Polymers: A Neutron Scattering Investigation" Polymer Preprints (ACS Division of Polymer Chemistry) 2005, 46(2), 1250-1251.

CONFERENCES

Antoniou, E.; Daskalakis, M.; Pasadakis, N.; Kalogerakis, N.; "Bioremediation of Hydrocarbon Releases in Deep Sea", 7th European Bioremediation Conference EBC-VII, Chania (Greece), June **2018** (oral presentation-ID385).

Antoniou, E.; Mandalenaki, A.; Kalogerakis, N.; "High Purity Biosurfactants Generated via a Novel Production Scheme using Heavy Oil Residues and their Role in Oil Remediation", 7th European Bioremediation Conference EBC-VII, Chania (Greece), June **2018** (poster-ID418).

Antoniou, E.; Chatzidakis, S.; Magiopoulos, I.; Pitta, P.; Zanaroli, G.; Kalogerakis, N.; "In Situ Oil Burning Impact on the Marine Shallow Waters - A Mesocosm Experiment", 7th European Bioremediation Conference EBC-VII, Chania (Greece), June **2018** (poster-ID419).

Daskalakis, M.; Kechagia, M.; Kokolakis, P.; Tzamara, A.; **Antoniou, E.;** Kalogerakis, N. "Oil Dispersant Efficiency in Subsea Application" 7th European Bioremediation Conference EBC-VII, Chania (Greece), June **2018** (poster-ID420).

Antoniou, E.; Mandalenaki, A.; Kalogerakis, N.; "Large scale microbial production of high purity bio-surfactants and their role in the bioremediation of petroleum hydrocarbons in the marine environment" The BioMicroWorld 2017 Conference, (Madrid (Spain), 18-20 October 2017 (oral presentation).

Antoniou, E.; Daskalakis, M.; Pasadakis, N.; Kalogerakis, N.; "Bioremediation of hydrocarbon releases under high pressure conditions", The BioMicroWorld2017 Conference, (Madrid (Spain), 18-20 October 2017 (poster).

Kalogerakis, G. C.; Ntinopoulos, D.; Triantafyllidi, E.I.; Syranidou, E.; **Antoniou, E.;** Partsinevelos, P.; Gotsis, A.D.; Karkanorachaki, K.; Kyparissis, S.; Fava, F.; Corvini, P. and Kalogerakis, N. "Fragmentation vs. biodegradation of weathered polyethylene plastic films in the marine environment", 10th ISEB, Barcelona, Spain, May **2016**

Antoniou, E.; Fodelianakis, S.; Kalogerakis, N. "Biofilm used as bioaugmentation-biostimulation pad for enhanced remediation of hydrocarbons in the marine environment" 6th European Bioremediation Conference, Chania, Crete, Greece **2015**, (Bio)-Technologies to Combat Marine Oil Spills (poster 403).

Antoniou, E.; Fodelianakis, S.; Kalogerakis, N. "Microbial production of biosurfactants and their role in the bioremediation of petroleum hydrocarbons in the marine environment" 6th European Bioremediation Conference, Chania, Crete, Greece **2015**, (Bio)-Technologies to Combat Marine Oil Spills (poster 404).

Fodelianakis, S.; **Antoniou, E.**; Mapelli, F.; Magagnini, M.; Nikolopoulou, M.; Mahjoubi, M.; Jaouani, A.; Amer, R.; Hussein, E.; Al-Horani, F. A.; Benzha, F.; Blaghen, M.; Malkawi, H. I.; Abdel-Fattah, Y.; Cherif, A.; Daffonchio, D.; Kalogerakis, N. "Bioaugmentation of oil-polluted sediments and the implications for the invasion concept in microbial ecology" 6th European Bioremediation Conference, Chania, Crete, Greece **2015**, Biomonitoring and Bioremediation of Contaminated Sediments (oral 240).

Alexandridis, P.; Tsianou, M.; **Antoniou, E.**; Sarkar, B.; Ravi, V.; Bodratti, A. M.; "Solvent-modulated organization of amphiphilic polymers in solution and on surfaces" 20th International Symposium on surfactants in solution SIS2014, Coimbra Portugal, **2014**, P9.5 Polymeric & Polymerizable Surfactants (poster).

Antoniou, E.; Fodelianakis, S.; Kalogerakis, N. "Crude oil degradation enhancement by biofilm formation using marine hydrocarbon degrading bacterial consortia" International Conference MedRem-**2014**, Hammamet, Tunisia.

Fodelianakis, S.; **Antoniou, E.**; Mapelli, F.; Magagnini, M.; Nikolopoulou, M.; Mahjoubi, M.; Jaouani, A.; Amer, R.; Hussein, E.; Al-Horani, F. A.; Benzha, F.; Blaghen, M.; Malkawi, H. I.; Abdel-Fattah, Y.; Cherif, A.; Daffonchio, D.; Kalogerakis, N. "Ex-situ bioremediation of oil polluted sediment using different hydrocarbon degrading consortia isolated from the Mediterranean and the Red Sea" International Conference MedRem-**2014**, Hammamet, Tunisia.

Antoniou, E.; Korkakaki, E.; Kalogerakis, N. "Biosurfactant production from hydrocarbon degrading marine bacterial community" 5th National Mikrobiokosmos Conference **2012**, Athens, Greece (poster).

Korkakaki, E.; **Antoniou, E.**; Nikolopoulou, M.; Venieri, D.; Kalogerakis, N. "Biosurfactant production from an isolated marine bacterial community", Environmental Microbiology and Biotechnology Conference, Bologna, Italy **2012**.

Karonis, D.; Pasadakis, N.; **Antoniou, E.** "Light cycle oil solvent extraction optimization: Impact of solvent, temperature, and solvent to feed ratio variation" *Fuel Preprints* **2011** (ACS Division of Fuel Chemistry).

Antoniou, E.; Vlassopoulos, D. "Polymer/inorganic nanocomposites characterization in organic solvents and in the presence of polymer chains (depletion effects)", Topical Meeting "Synthesis and Surface Modification of Nanocolloids", Baiona, Spain, **2009**.

Antoniou, E.; Tsianou, M.; Alexandridis, P. "Solvent Modulation of Polysaccharide Conformation" Extended Abstract, AICHE 2008 Annual Meeting, Philadelphia, Pennsylvania, United States, **2008**, #443c - Self Assembly in Solution I. <http://www.nt.ntnu.no/users/skoge/prost/proceedings/aiche-2008/data/papers/P133290.pdf>

Tsianou, M.; Fajalia, A. I.; **Antoniou, E.**; Alexandridis, P. "Control of Self-Assembly by Molecular Recognition Between Hydrophobes and Cyclodextrins" Abstracts of Papers, AICHE 2008 Annual Meeting, Philadelphia, Pennsylvania, United States, **2008**, #509e - Self Assembly in Solution II.

Antoniou, E.; Themistou, E.; Tsianou, M.; Alexandridis, P. "Polysaccharide solution properties modulated by solvent mixtures" Abstracts of Papers, 236th ACS National Meeting, Philadelphia, PA, United States, 2008, POLY-633.

Antoniou, E.; Themistou, E.; Tsianou, M.; Alexandridis, P. "Dextran in polar solvents: Dilute solution viscometry" Abstracts of Papers, 236th ACS National Meeting, Philadelphia, PA, United States, **2008**, PMSE-194.

Antoniou, E.; Themistou, E.; Tsianou, M.; Alexandridis, P. "Solvent Effects on Polysaccharide Conformation" Extended Abstract, AICHE 2007 Annual Meeting, Salt Lake City, Utah, United States, **2007**, #418c - Fundamentals of Interfacial Phenomena II.

Antoniou, E.; Buitrago, C. F.; Tsianou, M.; Alexandridis, P. "Solution Properties of Polysaccharides in Water and Polar Organic Solvents" Abstracts of Papers, AICHE 2006 Annual Meeting, San Francisco CA, United States, **2006**, #462 - Self Assembly in Solution II. <http://aiche.confex.com/aiche/2006/techprogram/P74107.HTM>

Antoniou, E.; Tsianou, M.; Neelamegham, S.; Alexandridis, P. "Interactions between Fibrinogen and PEG Polymers in Aqueous Solution" Abstracts of Papers, AICHE 2006 Annual Meeting, San Francisco CA, United States, **2006**, # 204f - Self-Assembled Biomaterials. <http://aiche.confex.com/aiche/2006/webprogrampreliminary/Paper74221.html>

Antoniou, E.; Tsianou, M.; Alexandridis, P. "Solvent and Solute Effects on Aqueous Solution Properties of Associating Polymers" Abstracts of Papers, 230th ACS National Meeting, Washington, DC, United States, **2005**, COLL-023.

Antoniou, E.; Tsianou, M.; Alexandridis, P. "Solution Properties of Polysaccharides in Water and Polar Organic Solvents" *Polymer Preprints* (ACS Division of Polymer Chemistry) **2005**, 6(2), 532-533.

Alexandridis, P.; Tsianou, M.; **Antoniou, E.**; Katori, Y.; Singh, I.; Neelamegham, S. "Interactions between Fibrinogen and PEG Polymers: A Neutron Scattering Investigation" *Polymer Preprints* (ACS Division of Polymer Chemistry) **2005**, 46(2), 1250-1251.

PATENTS

Antoniou, E.; Kalogerakis, N.; International Hellenic University; Technical University of Crete; "Production Method of high purity Biosurfactants from marine bacteria that biodegrade heavy crude oil byproducts", #1009585, **2017**, Hellenic Industrial Property Organisation (OBI).

Kalogerakis, N.; Fodelianakis, S.; **Antoniou, E.**; Korkakaki, E.; "Production and application of a novel Bioaugmentation Pad for marine oil spills", #1008475, **2015**, Hellenic Industrial Property Organisation (OBI).

BOOK CHAPTERS

Antoniou, E.; Tsianou, M.; Alexandridis, P. "Dextran Solution Properties" chapter in *Dextran: Chemical Structure, Applications and Potential Side Effects*, Nova Science Publishers, Inc., **2014**, [ISBN: 978-1-62948-960-5](https://doi.org/10.1080/978-1-62948-960-5), pp. 1-30.

List of relevant previous projects or activities

RESEARCH PROJECT: Bioremediation of Crude Oil, Dispersant-Biosurfactant characterization, European Project **FP7 "KILL*SPILL – Integrated Biotechnological Solutions for Combating Marine Oil Spills – KAE 80724"** (2013-2017)

RESEARCH PROJECT: Biosurfactant Production-Isolation-characterization, European Project **FP7 "ULIXES - Unravelling and exploiting Mediterranean Sea microbial diversity and ecology for Xenobiotics' and pollutants' clean up - KAE 80398"** (2011-2014)

PROJECT: "Characterization of oil products of Motor Oil HELLAS, Corinth Refineries S.A., with chromatographic and spectroscopic methods for the needs of the European Regulation REACH 1907/2006" Funded by "Motor Oil HELLAS" (2010).

PROJECT: "Characterization of oil products of the Hellenic Petroleum S.A. with chromatographic and spectroscopic methods for the needs of the European Regulation REACH 1907/2006". Funded by the "Hellenic Petroleum S.A." (2010).