



Doctoral Vacancy Announcement form

Research Topic Title: “Application of Advanced Oxidation Processes (AOPs) for the detoxification of cyanotoxin contaminated water”

No. of Openings: 1

Description: The presence and subsequently the removal of micropollutants like pesticides, hormones, medical drugs and naturally occurring toxic metabolites (cyanotoxins) from water resources comprises a challenge for the water and wastewater industry. In order to remove micropollutants in trace concentrations from water resources chemical oxidation technologies such as ozonation and advanced oxidation processes (AOPs) are increasingly used to treat different types of source water and wastewater. The aim of this thesis is to explore the potential application of various AOPs for the removal of a group of natural toxins produced from the toxic strains of cyanobacteria, commonly known as cyanotoxins. The study aims to determine the tested AOPs efficiency and energy demands, toxicity of end product and unveil the transformation products. This will be a collaborative project with the University of Gdansk in Poland (Prof. Hanna Mazur-Marzec).

Required Qualifications: Successful candidates must possess a Bachelor’s degree from an accredited University in Chemistry or Chemical Engineering or Biochemistry and/or a postgraduate degree (Master level) from an accredited University in the field of Environmental Chemistry, Analytical Chemistry, Toxicology, Environmental Science or Environmental Engineering. The candidates must be fluent in English. Previous experience in the above-mentioned research topic will be considered as an advantage.

Funding: N/A

Research Advisor:

Name/Surname: Maria G. Antoniou

Position: Associate Professor

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Doctoral Vacancy Announcement form

Research Topic Title: “Detection and removal of taste and odor compounds from surface waters contaminated with cyanobacterial harmful blooms (cyano-HABs)”

No. of Openings: 1

Description: Cyanobacteria (blue-green algae) are phototrophic microorganisms and represent an essential component of the food web in all aquatic ecosystems. However, certain strains of cyanobacteria have the ability to produce bioactive secondary metabolites along with taste and odor compounds that make the water unfit for use. Climate change and anthropogenic activities are major contributors towards the more frequent and prolonged appearance of cyanobacterial harmful blooms (Cyano-HABs) across the globe, adding further pressure on scarce fresh water supplies. In order to mitigate the effects of cyanobacteria and cyanotoxins measurements need to be taken at source. This study aims to apply advanced analytical techniques to identify taste and odor compounds (beyond the terpenoids geosmin and MIB) apply various physico-chemical methods for restoring cyanobacterial contaminated sites. This will be a collaborative project with the Technical University of Crete (Prof. Elia Psillakis).

Required Qualifications: Successful candidates must possess a Bachelor’s degree from an accredited University in Chemistry, Environmental Engineering, Chemical Engineering and/or a postgraduate degree (Master level) from an accredited University in the field of Environmental Chemistry, Analytical Chemistry, Environmental Science or Environmental Engineering. The candidates must be fluent in English. Previous experience in the above-mentioned research topic will be considered as an advantage.

Funding: N/A

Research Advisor:

Name/Surname: Maria G. Antoniou

Position: Associate Professor

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Doctoral Vacancy Announcement form

Research Topic Title: “Use of nanoparticles in Cells for Therapeutic Applications”

No. of Openings: 1

Description: Aims of the Project: Synthesis of nanoparticles in flow systems for therapeutic applications. Design of Au-based functionalised colloidal nanoparticles for cancer diagnosis and potential treatment. Study the effect of size and shape, and final morphology. Use of monometallic and bimetallic nanoparticles based on Au, Ag and Cu. Study the effect of stabiliser. Apply the synthesised nanoparticles for possible biomedical applications, such as: Targeted Drug Delivery, Enhanced Imaging, Therapeutic Agents Multifunctionality, Overcoming Drug Resistance and Personalized Medicine. CFD modelling on the formation of the AuNPs and mechanistic studies for cancer applications.

Required Qualifications: Candidates should possess an undergraduate degree and postgraduate qualification at the Master level from accredited universities in chemical engineering, or any other related field. A strong background in computer programming using MATLAB, gPROMS, COMSOL Multiphysics or similar languages is required

Funding: n/a

Research Advisor:

Name/Surname: Achilleas Konstantinou

Position: Associate Professor

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Doctoral Vacancy Announcement form

Research Topic Title: “Computational Investigation of Microreactor Configurations for Hydrogen Production from Formic Acid/Hydrous Hydrazine Decomposition using a heterogeneous Catalysts”

No. of Openings: 1

Description: The need to replace fossil fuels with sustainable alternatives has been a critical issue in recent years. Hydrogen fuel is a promising alternative to fossil fuels because of its wide availability and high energy density. For the very first time, novel microreactor configurations for the formic acid decomposition will be studied using computational modelling methodologies. Computational fluid dynamics (CFD) will be utilised to develop the comprehensive heterogeneous microreactor models. The CFD modelling study begins with the development of a packed bed microreactor to validate experimental results, subsequently followed by the theoretical development of novel microreactor configurations to perform further studies. The detailed models developed in this work will provide an interesting insight into the intensification of the formic acid decomposition reaction, using a heterogeneous catalysts.

Required Qualifications: Candidates should possess an undergraduate degree and postgraduate qualification at the Master level from accredited universities in chemical engineering, or any other related field. A strong background in computer programming using MATLAB, gPROMS, COMSOL Multiphysics or similar languages is required

Funding: n/a

Research Advisor:

Name/Surname: Achilleas Konstantinou

Position: Associate Professor

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Doctoral Vacancy Announcement form

Research Topic Title: "Creating Local Ecosystems of Climate Innovation"

No. of Openings: 2

Description:

The aim of the research is to measure and analyze the effect of local traditions for the development of integrated regeneration practices for a sustainable future through innovation and entrepreneurship. Existing practices in South-East Europe (Greece, Croatia, Western Balkans, Cyprus) and the whole of the Middle East-North Africa (MENA region) will be studied and compared with more developed countries (Israel, Korea, USA, etc). Furthermore, the role of "champions" and of "regional development policies" will be an integral part of this research.

Required Qualifications:

Successful candidates should possess a Bachelor's and/or Master's degrees from an accredited University in Business and/or Management and/or Environmental Studies or in a relevant field. Should be willing to engage in interdisciplinary work on climate studies, engineering and innovation.

Funding: n/a

Research Advisor:

Name/Surname: Alexandros Charalambides

Position: Associate Professor

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Doctoral Vacancy Announcement form

Research Topic Title: “Energy and Meteorology”

No. of Openings: 2

Description: Electricity production from Photovoltaics (PVs) is heavily dependent on local meteorological phenomena, especially cloud type and cloud cover. Thus, in order to further promote the penetration of small-scale roof-top PVs in cities, the effect of clouds on PVs and the prediction of electricity production from these systems needs to be understood and any problems should be resolved. The current project addresses this topic and a software will be developed based on a novel methodology (patent pending) for the prediction electricity production from PVs.

Required Qualifications: Successful candidates should possess Bachelor’s and Master’s degrees from an accredited University in Mechanical or Electrical Engineering or Physics. They should have experience in computer software (Python/C++/Matlab/GIS/etc) and should be willing to engage in interdisciplinary work on energy and meteorology.

Funding: n/a

Research Advisor:

Name/Surname: Alexandros Charalambides

Position: Associate Professor

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Doctoral Vacancy Announcement form

Research Topic Title: “Hydrogen Production Processes from Zero-Valent Metals and Their Use in Anaerobic Microbial Processes”

No. of Openings: 2

Description:

As part of this PhD research topic, the following will be studied:

- Methods for synthesizing zero-valent metals and their application in hydrogen production and CO₂ capture.
- Hydrogen production reactions using metals in aqueous conditions and in the presence of dissolved CO₂. Strategies to enhance reaction efficiency (e.g., removal of the passive layer, increase of specific surface area, etc.).
- Integration of hydrogen production processes with hydrogenotrophic and other autotrophic microorganisms for methane and acetic acid production.
- Use of zero-valent metals in anaerobic processes for the conversion of organic municipal waste into hexanoic and/or heptanoic acid.
- Application of zero-valent metals in anaerobic processes for wastewater treatment

Required Qualifications: Candidates must hold a recognized Bachelor's and Master's degree in Chemical Engineering, Biotechnology, Industrial Engineering, Chemistry, Biology, Environmental Engineering, or a related field. Additionally, they must have a satisfactory level of English proficiency.

Funding: Employment in the research project Caring Nature (Horizon) for one year, with a gross salary of €1,350 per month, with the possibility of renewal for an additional 6 months.

Research Advisor:

Name/Surname: Ioannis Vyrides

Position: Associate Professor

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Doctoral Vacancy Announcement form

Research Topic Title: “Understanding the dynamics of degrading microplastics in complex environmental conditions and settings”

No. of Openings: 1

Description: One of the grand challenges of our generation, and many to come, is understanding and mitigating the impact of microplastics on the environment and human health. As plastic pollution continues to escalate, driven by increasing production and inadequate waste management, microplastics have become pervasive contaminants in marine, freshwater, and terrestrial ecosystems. Their persistence, capacity to adsorb toxic substances, and potential for bioaccumulation raise critical concerns about long-term ecological and health consequences. Addressing this challenge requires a multidisciplinary approach that integrates advanced modeling, computational simulations, and experimental studies to unravel the complex mechanisms governing microplastic degradation, transport, and interactions with biological and chemical systems. By improving our understanding of these processes, we can develop more effective strategies for monitoring, predicting, and ultimately reducing the risks associated with microplastic pollution.

The doctoral opening will examine complex microscale phenomena of degrading microplastics, examining the effect of anisotropic particle geometries, surface degradation phenomena and environmental conditions, in fluidic or porous media. The balance between modelling, computational work and (microfluidic) experiments will be tuned according to the competences of the selected candidates.

The selected candidate will join an interdisciplinary research team with strong expertise in mathematical modeling, computational simulations, laboratory work and microplastic pollution research.

Required Qualifications: Candidates should possess a Bachelor’s and postgraduate degree of Master’s level from accredited Universities in Chemical Engineering, Chemistry, Bioengineering, Environmental Engineering, Applied Mathematics, Material Science, Physics or any other related field and to be fluent in English.



Cyprus
University of
Technology

Studies and
Student Welfare
Services

Funding:n/a

Research Advisor:

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Position: Associate Professor

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Doctoral Vacancy Announcement form

Research Topic Title: “Bioprocess Development for Waste Bioplastics Treatment

No. of Openings: 1

Description: Bioplastics, defined as the plastics which are either characterised as bio-based or biodegradable, currently hold significant interest as sustainable alternatives to their fossil-based counterparts. However, although biodegradable plastics are truly biodegradable only under industrial conditions, their leakage to the marine and terrestrial environment should be avoided given that the disposal of bioplastics could enhance the negative impact imposed by “white pollution”. The current Thesis will focus on developing novel bioprocesses for valorisation of major bioplastics, which will be applied without or following aging/pretreatment. Tailored innovative strategies based on microbial and enzymatic systems will be implemented. Molecular techniques (NGS, qPCR) will be applied to monitor the composition of the microbial communities formed as well as expression from specific genes that pertain to important metabolic pathways of the strains involved.

Required Qualifications: Candidates should possess a Bachelor’s and postgraduate degree of Master’s level from accredited Universities in Chemical Engineering, Chemistry, Biotechnology, Bioengineering, Biology, Environmental Engineering or any other related field and to be fluent in English.

Funding: n/a

Research Advisor:

Name/Surname: Michalis Koutinas

Position: Associate Professor

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Doctoral Vacancy Announcement form

Research Topic Title: “Mechanistic modelling of the separation of polydisperse liquid-liquid mixtures”

No. of Openings: 1

Description: Liquid-liquid mixtures are widely encountered in various engineering sectors, including the oil and gas, chemical, pharmaceutical, and food industries. Dispersed liquid-liquid mixtures naturally separate under the influence of gravity due to density differences. This tendency can be leveraged in the design of gravity settlers and in-line separators to enhance phase separation efficiency. Mechanistic models, which are mathematical representations of the underlying separation mechanisms, play a crucial role in predicting and optimising these processes. This work focuses on modelling the separation of polydisperse liquid-liquid mixtures in gravity settlers and horizontal pipes. Key mechanisms such as droplet settling, drop-drop coalescence, and drop-interface coalescence will be considered, with particular emphasis on polydisperse emulsions. The developed model will predict the evolution of the pure and dispersed layers over time. The successful candidate will be responsible for modifying and optimising existing models to account for polydispersity, enhancing predictive accuracy and broadening their applicability.

Required Qualifications: Successful candidates should possess Bachelor’s and Master’s degrees from an accredited university in Chemical Engineering, or a related field. A background in MATLAB, gPROMS, OpenFOAM, or similar software is required. Candidates must be fluent in English. Previous research experience in multiphase systems will be considered an advantage.

Funding: Tuition waiver in the form of a full scholarship according to the decisions of the 236th Session of the Rector's Council.

Research Advisor:

Name/Surname: Nikola Evripidou

Position: Lecturer

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Doctoral Vacancy Announcement form

Research Topic Title: “Addressing Uncertainty in the in-silico design of circular composite materials”

No. of Openings: 1

Description: Our ever-increasing waste production, averaging to about 5000kg per person and totalling 2.2 Billion tonnes across EU annually, requires accelerating our transition to a Circular Economy. At the heart of this endeavour lies waste valorisation, emphasized as a cornerstone for sustainable growth, by the European Union's Circular Economy Action Plan. A key challenge is addressing the uncertainty in material and morphological properties of materials derived from waste streams. In-silico design supports material development, by reducing trial-and-error experimentation. In the case of circular composite materials, in-silico material design requires addressing the uncertainty in material properties of constituents so that the uncertainty in the end-product is minimised and falls within acceptable QA standards. This doctoral work will combine homogenization techniques for composite materials, FEM simulations with Uncertainty Quantification techniques of Statistics, such as Bayesian and Monte Carlo methods. The successful candidate will extend current homogenization techniques to address the uncertainty in morphological shapes of reinforcing additives in composite materials and the material properties of the matrix and inclusions.

The selected candidate will join an interdisciplinary research team with strong expertise in in-silico material design, mathematical modelling, and computational simulations.

Required Qualifications:

We are seeking a highly motivated candidate with a strong interest in sustainable materials development within the framework of circular economy and a Bachelor's degree and postgraduate degree (Master's level) from an accredited University in **one or more** of the following areas:

- Chemical engineering
 - Mechanical engineering
 - Applied mathematics
 - Materials science,
- or a related field.



The ideal candidate will have experience in one or more of the following:

- Continuum mechanics modelling, homogenisation methods for composite materials
- Multi-scale modelling techniques, computational mechanics, particularly finite element methods (FEM),
- Statistical methods for uncertainty quantification, such as Bayesian inference and Monte Carlo simulations.

The successful candidate will demonstrate excellent problem-solving abilities, strong programming skills and proficiency in relevant software tools, effective communication skills, and a collaborative mindset to work within an interdisciplinary research team.

Previous experience (e.g., during the preparation of a diploma or Master thesis) in the above-mentioned research topic will be considered as an advantage.

Funding:

Depending on the candidate's expertise and qualifications, funding may be available.

Research Advisor:

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