

NOMATEN Hybrid Seminar

Location: NOMATEN seminar room (102)

gotomeeting room (for online): <https://meet.goto.com/NCBJmeetings/nomaten-seminar>

Seminar date: May 13th, 2025

Time: 1 PM (CEST)

Title: Heterogenous photocatalysis: from principles to applications

Speaker: Prof. Adriana Zaleska-Medynska

Speaker affiliation: Department of Environmental Technology, Faculty of Chemistry, University of Gdańsk

Abstract: In the last decade five main application pathways have been developed in heterogeneous photocatalysis, including: (i) air treatment, (ii) water treatment, (iii) hydrogen evolution, (iv) CO₂ photoconversion, and very recently (v) ammonia synthesis. These technologies are at different levels of maturity, from TRL 3-4 for ammonia synthesis and CO₂ photoconversion, through TRL 6-7 for hydrogen generation, up to TRL 9 for pollutants degradation.

These five directions mentioned above will be discussed from photocatalyst design and selection up to optimal reactors engineering.

Bio: Prof. dr hab. inż. Adriana ZALESKA-MEDYNSKA - Head of the Department of Environmental Technology and the Photocatalysis Group at the Faculty of Chemistry, University of Gdańsk, Poland. She has been conducting research in the field of heterogeneous photocatalysis for over 25 years, leading teams first at the Faculty of Chemistry, Gdańsk University of Technology and since 2012 at the University of Gdańsk. Her research is aimed on correlating the surface properties of new nanomaterials with their preparation method and photoactivity, explaining the mechanisms of photocatalytic reactions, as well as designing and testing prototype devices using photocatalytic reactions (including devices for air purification, deodorization and disinfection). In recent years, her research combines experimental chemistry with theoretical calculations, which allows predicting the structures of new nanomaterials and explaining the interactions between the surface of semiconductor materials and reagents.

Author and co-author of 214 papers, 1 book (<https://doi.org/10.1016/C2016-0-01872-7>), 16 chapters in books and monographs, 17 patents, 19 patent applications, over 400 short communications; h index = 48, total citations: > 9,400. She completed foreign internships in leading research units, including: University of Utah, Salt Lake City, USA (7 months, 1997 and 2 months, 2004), California Institute of Technology, USA (12 months in 2001-2002), University of California at Berkeley, USA (2 months, 2010-2011), Stanford University, USA (2 months, 2012), National Institute for Environmental Science, Tsukuba, Japan (short-term fellowship, 2013); Weizmann Institute, Israel (4 months, 2018). She gave lectures at Beijing Institute of Technology, Beijing, People's Republic of China (course for PhD students in School of Chemistry, 2015) and at Universidad de las Fuerzas Armadas, Ecuador (Erasmus Staff Training, course in heterogeneous photocatalysis for graduated students, 2019).

She managed research and development projects financed by the Ministry of Science and Higher Education (5), National Science Center (5), National Center for Research and Development (3), Norwegian Funds (2), EU Horizon (1, leader of UG tasks) and Voivodeship Fund for Environmental Protection (2). Supervisor of 22 PhD thesis (defended) and supervisor of Engineering and Master thesis (137 students at Faculty of Chemistry/ Gdansk University of Technology, Poland and Faculty of Chemistry/ University of Gdansk, Poland. Since December 2020, director of the Association of Daniel Fahrenheit Universities in Gdańsk. She's a serving as an expert in grant and grant report evaluation (National Science Center 2022, 2023 and 2024 and FWO W&T4 Fellowship (2022-2024 and 2025-2027)). From 2023, a member of the Gdańsk Entrepreneurship Council, member of the Strategy Council of the Pomeranian Territorial Forum and a member of the Climate Council established at the UN Global Compact Network Poland. Among others, awarded for applied research by Primum Cooperatio Award (2022) and got Minister's Award for organizational activity (1st degree individual award, 2024).