



NANOTECHNOLOGY SEMINARS

Engineering Functional Materials for Real-World Applications: Biosensing, Gas sensing and Energy Storage

Wednesday, 6th May 2026

10:30 am

Aula E4 | Piso -1 | ETS de Ingenieros Industriales y de Telecomunicación

ABSTRACT: This talk will present recent advances in the design and engineering of functional materials for real-world applications, with a focus on biosensing, gas sensing, and energy storage. The work highlights the development of nanostructured materials, including metal oxides, carbon-based composites, and hybrid nanoarchitectures, tailored to achieve enhanced electrical, catalytic, and surface properties.

In the field of biosensing, emphasis will be placed on the integration of these materials into electrochemical platforms for the detection of clinically relevant biomarkers, enabling sensitive, low-cost, and portable diagnostic solutions. Strategies such as surface engineering, nanoheterojunction design, and the use of catalytic nanomaterials will be discussed as key approaches to improve sensitivity, selectivity, and stability.

For gas sensing applications, the presentation will explore the use of semiconductor metal oxides and nanostructured heterojunctions for the detection of gases and volatile organic compounds (VOCs). Particular attention will be given to the role of morphology control, and surface functionalization, as well as to strategies for enhancing selectivity and response under real operating conditions.

In energy storage, recent progress in the development of nanostructured materials for supercapacitors will be addressed, focusing on improving charge storage capacity, cycling stability, and energy density through controlled composition and architecture.

Overall, the talk will discuss the challenges and opportunities in translating functional materials from laboratory-scale research to practical applications, with emphasis on scalability, sustainability, and the development of cost-effective technologies with real societal impact.



THE SPEAKER:

Dr. Talita Mazon is a Senior Technologist at the Centro de Tecnologia da Informação Renato Archer (CTI), Brazil, with a background in Chemistry (B.Sc. - 1994, M.Sc - 1997., and Ph.D. - 2001) and expertise in materials science and nanotechnology. Her research focuses on the design and synthesis of advanced functional materials, including nanostructured metal oxides, ceramic systems, and carbon-based composites. She has extensive experience in developing electrochemical biosensors for the detection of clinically relevant biomarkers, as well as in integrating these materials into portable, low-cost diagnostic platforms. She has authored over 45 scientific publications in peer-reviewed journals. Her work also encompasses energy storage and environmental applications, including nanomaterials for supercapacitors, gas sensors and photocatalytic systems for pollutant degradation. Prof. Mazon has coordinated and participated in several national and international research projects and collaborates closely with academic and industrial partners. Her research aims to bridge the gap between fundamental materials development and real-world technological applications, contributing to innovation in health, energy, and environmental solutions.

