



## **AVVISO DI SEMINARIO**

Il giorno martedì 23 Giugno 2026, ore 11:30.

nell'Aula Pietro Gismondi

### **La Prof.ssa Emine Kayhan**

*Associate Professor of Inorganic and Physical Chemistry*  
Uşak University

Terrà un seminario dal titolo

# **“From Graphene to Gold: Functional Carbon Materials, Nanoparticle Synthesis, Biosensor Development, and Advanced Composites for Collaborative Research”**

Erasmus Mobility

## **Abstract**

This presentation outlines the research expertise and collaborative potential of **Emine Kayhan** (Assoc. Prof, Uşak University), spanning functional carbon nanomaterials, metal nanoparticle synthesis and functionalization, biosensor development, and advanced composite materials.

The central theme of this talk is the synthesis and functional engineering of carbon-based nanomaterials — from large-area, transparent graphene films grown by chemical vapor deposition (CVD) to graphene oxide and graphene quantum dots — and their integration into energy, sensing, and catalytic systems. This background encompasses palladium nanoparticles supported on chemically derived graphene for hydrogen generation,  $\text{CoFe}_2\text{O}_4$  and  $\text{Fe}_3\text{O}_4$  nanoparticles on carbon supports for lithium-ion and lithium-air batteries, and PdNi nanoparticles on  $\text{SnO}_2$ -C composites for electrocatalytic applications.

Building on this foundation, recent work focuses on graphene quantum dot-based optical biosensor systems for rapid and portable detection of foodborne pathogens such as *Salmonella* spp., developed within an active TÜBİTAK project. The presentation will also cover advances in composite materials engineering — including glass fiber-reinforced polyester composites with tailored flame-retardant and radiation-shielding properties — as well as photochromic bismuth tungstate ceramics synthesized under controlled temperature conditions.

The overarching aim of this presentation is to identify synergistic collaboration opportunities with researchers at Tor Vergata who study on complementary applications: our group brings expertise in nanomaterial synthesis and functionalization — carbon materials, metal and metal oxide nanoparticles, functional composites — while prospective partners may contribute in areas such as advanced biosensor fabrication, electrochemical characterization, device integration, dental or biomedical applications.

**Researchers interested in joint publications, Erasmus+ student exchanges, or co-supervised thesis projects are warmly invited to connect.**