



# A QUANTUM OF MATTER

## Solar Chemistry: a challenge for materials science

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**Wednesday November 2, 2022 - 14.00**  
**Aula B107 – Polo Ferrari (Povo 2), Povo**

Solar chemistry, where sunlight is employed to drive complex chemical reactions, showed in recent years the potential for a disruptive transformation of the chemical industry: from the accumulation of solar energy into the chemical bonds of clean fuels like hydrogen, to the photosynthesis of value-added products such as pharmaceuticals or hydrocarbons from CO<sub>2</sub>, to wastewater treatment and environmental remediation. At the heart of this transformation lies a series of challenges for materials physics and chemistry, which are called to deliver a novel generation of materials that are not only highly efficient, but also industrially scalable and environmentally compatible.

In this seminar, I will explore the main open issues in the field through case studies taken from my recent research: a photoelectrode design for photo-electrochemical cells producing hydrogen, solar wastewater remediation with ZnO photocatalysts, and the photosynthesis of a pharmaceutical product on a Fe-based catalysts.

### **Who is Michele Orlandi?**

Michele Orlandi received his PhD in Photochemistry & Photocatalysis from the University of Ferrara in 2010. After pursuing his research interests with post-doctoral fellowships both in academia and in the industry, he is now Assistant Professor (RTDB) in the Physics Department of the University of Trento. As a member of the IdEA (Hydrogen, Energy, Environment) lab, most of his research is focused on the design, fabrication and testing of materials for solar fuels production and solar wastewater treatments, with an emphasis on sustainable materials and processes.

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**A Quantum of Matter** is a series of events dedicated to the research in Physics of Matter that is carried out in the **Physics Department of the University of Trento**. The goal of **A Quantum of Matter** is to develop synergies and collaborations between research groups: for this reason, the seminars will focus not only on the results obtained, but also on the techniques employed by the groups and on the possible research themes that could be developed in partnership, leaving plenty of room for exchange of opinions and discussion.

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