UNIVERSITÀ DI TRENTO | Department of Physics

A Quantum of Matter

Bio-based macromolecular architecture: how to treasure natural molecules to develop new polymeric structures

Claudio Gioia
Department of Physics, University of Trento

Wednesday February 22, 2023 - 15.00
Aula B107 – Polo Ferrari (Povo 2), Povo

The recent advent of green chemistry is currently promoting an unprecedented effort to achieve new safe and sustainable materials, particularly shifting from petrol in favor of sustainable alternatives. Fortunately, Nature provides a variety of compounds presenting structures that can be exploited in chemistry and material science. In particular, by-products of the agroindustry constitute an outstanding opportunity to exploit cheap feedstocks for the creation of a promising pool of natural molecules. In material science, compounds such as polyphenols and lignin are extremely valuable as a source of natural aromatics able to confer pronounced thermo-mechanical performances. Furthermore, the presence of specific moieties in natural architectures can confer biocide or antioxidant behavior.
In this seminar, I will describe a general overview of a selection of my recent lines of research specifically designed to valorize the unique chemical structures of natural compounds, often through sustainable chemical modifications, to create novel functional macromolecular architectures.

Who is Claudio Gioia?
Claudio Gioia achieved his Ph.D. in Organic Chemistry at the Faculty of Industrial Chemistry of the University of Bologna in 2012, dealing with the development of enantioselective organocatalytic processes. He spent 6 years as a post-doc initially at the Department of Civil, Chemical, Environmental, and Materials Engineering of the University of Bologna, and subsequently at the Royal Institute of Technology (Stockholm), studying the synthesis of novel polymeric structures from natural feedstocks and wood components. In 2018 he achieved a Junior Assistant Professor position (RTDA) back at the University of Bologna, dealing with the valorization of agro-wastes for the production of novel macromolecular structures. Since September 2022 Claudio reached the position of Senior Assistant Professor (RTDB) in the bioorganic chemistry group at the Department of Physics of the University of Trento. His current lines of research deal with the chemical modification of lignocellulosic compounds to obtain new building blocks and monomers suitable for polymer science.

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.

---

https://qpm.physics.unitn.it/