UNIVERSITÀ DI TRENTO
Dipartimento di Ingegneria Industriale

DII Seminar

Can Green Chemistry technologies enables a new Circular Economy paradigm for food byproducts?

February 20th 2024, h. 11:00

Room A107, Polo Ferrari 1, Via Sommarive 9, Trento

Speaker: **Giovanni Perotto - Department of Nanophysics, Istituto Italiano di Tecnologia, Genova**

The food industry is responsible for 30% of total greenhouse gas emissions, and requires transformative technologies to join the battle against climate change. Reutilization of food waste and food byproducts, for example, is paramount to achieve UN Sustainable Development Goals. A circular economy paradigm is regarded as a possible sustainable way for valorization of the non edible waste and byproducts: they can become a new, renewable and sustainable source of raw materials, replacing fossil and non renewable sources, while also providing new value to the energy and labor used to produce those byproducts. The adoption of a circular economy model for biopolymers, requires the development of new enabling green chemistry technologies. The focus of my research activity has been the development of these technologies and in this seminar I will present the most recent results and an outlook for the future.

I divided food waste into three main categories: polysaccharides, proteins and hydrophobes. For each of the categories, I will show how the development of new green processes can repurpose food byproducts into materials with useful properties and how, the study of the structure-property relationship of food byproducts, can lead to the development of high performance materials that are fully obtained from valorization of waste.

This approach was at the heart of the valorization of vegetable byproducts to create 100% vegetable based biocomposite materials that could be used in applications like food packaging or as mulches for agriculture, and that was nominated as one of the 100 Circular Economy Stories by leading environmental association Legambiente. When sustainability metrics, such as LCA were used, this circular process provided some early evidence of the fact that it is environmentally favorable, when compared to the traditional and more assessed methods for the production of polyolefines.

Successful implementation of this approach will have huge and partially unexplored potential, with applications impacting many different fields, from the food sector (reduction of waste and new sustainable materials), to sustainable advanced technologies (new generation of green technological devices), to nanomedicine (new drugs, nutraceuticals and formulations) and I believe that it can lead to the development of a more sustainable society.

Info
Phone: +39 0461 282500
Email: dii.supportstaff@unitn.it

Local contact: andrea.dorigato@unitn.it

www.dii.unitn.it