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v Ljubljani

Fakulteta *za kemijo*
in kemijsko tehnologijo

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VABILO NA PREDAVANJE
V OKVIRU DOKTORSKEGA ŠTUDIJA
KEMIJSKE ZNANOSTI / INVITATION TO THE
LECTURE WITHIN DOCTORAL PROGRAMME IN
CHEMICAL SCIENCES

Prof. Gianluca Li Puma

Environmental Nanocatalysis & Photoreaction Engineering,
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z naslovom / title:

Environmental nanocatalysis & photoreaction engineering for environmental remediation and production of renewable energy

v sredo, 13. 4. 2022 ob 15. uri / on Wednesday, 13. 4. 2022 at 15.00

v predavalnici 1 v 1. nadstropju Fakultete za kemijo in kemijsko tehnologijo, Večna pot 113 **/ in lecture room 1,** 1st floor at the Faculty of Chemistry and Chemical Technology, Večna pot 113

Vljudno vabljeni! / Kindly invited!

Abstract:

Photochemical, photoelectrochemical and bioelectrochemical systems are feasible and potentially low-cost methods for the removal of toxic contaminants, micropollutants and contaminants of emerging concern (ECs) from the environment. These include sub-ppm levels of cyano-toxins, estrogens, pharmaceuticals, illicit drugs, personal care products, pesticides and many other ECs, as well as heavy metals, dissolved biomass, viruses and toxic bacteria. The process of water detoxification can be coupled with the simultaneous recovery of valuable resources, the production of hydrogen or the generation of electricity to yield a sustainable approach for environmental remediation, renewable energy and resources production. In such processes, for example, artificial light or solar light energy may be harvested by a suitable semiconductor and/or plasmonic photocatalytic material, electrons, holes and excited radical species are generated, and these can in concert oxidize organic waste with simultaneous reduction of dissolved heavy metals to yield their metallic species, water to yield hydrogen, and in photoelectrocatalytic and bioelectrochemical systems an electrical current can be generated. In addition, electrochemically active bacteria (EAB) can be tailored in bioelectrochemical systems to favor the production of key-block chemicals from CO2 waste or renewable hydrogen.
In this presentation the challenges related to the synthesis of materials with high photon-harvesting efficiency or bioelectrochemical activity, the engineering, design and scale-up of such combined process, modeling aspects, laboratory and pilot-scale demonstration studies are presented to unfold new avenues for a sustainable approach to renewable energy production and environmental protection.