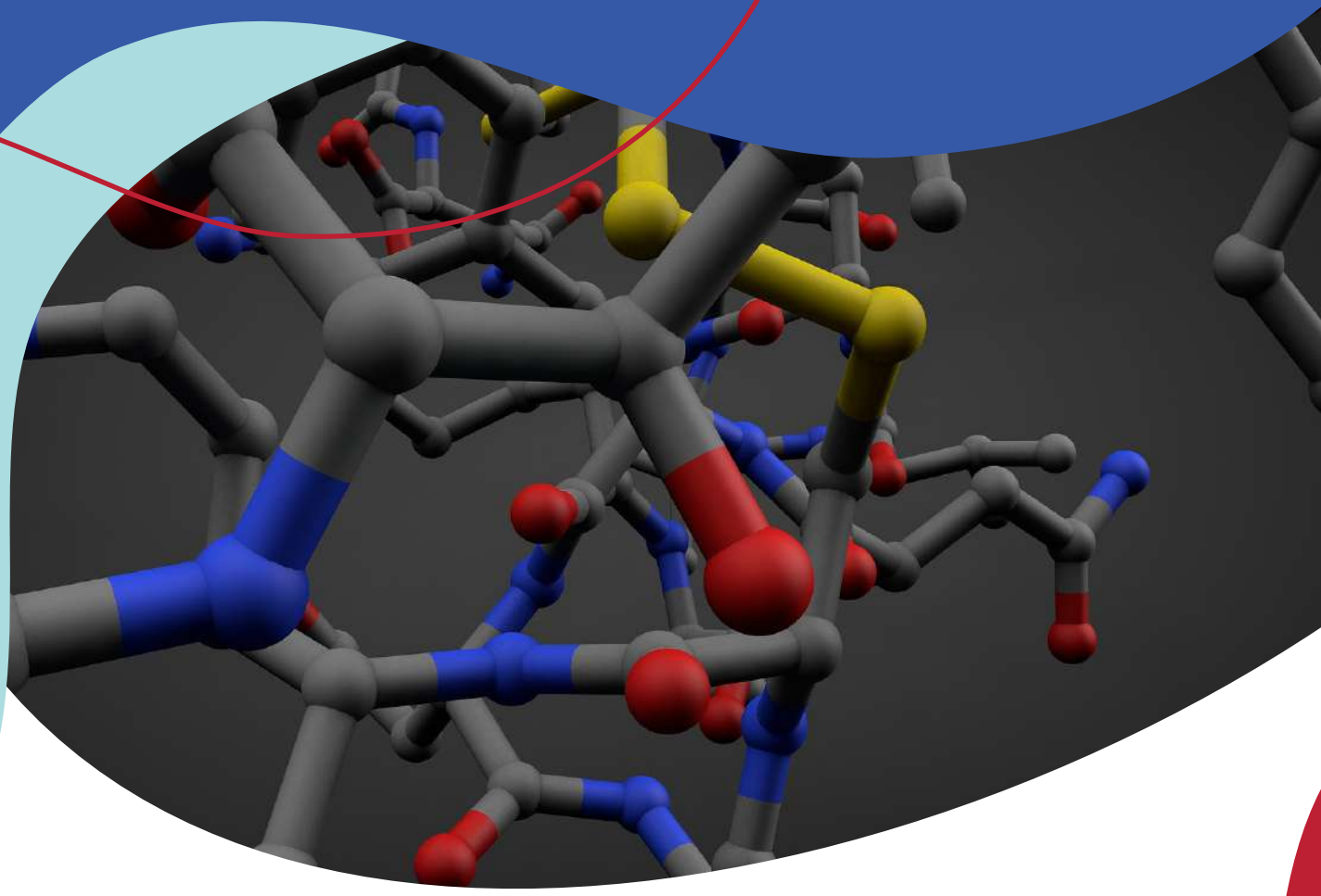
Politecnico di Torino

Department of Environment, Land and Infrastructure Engineering



ADVANCING MATERIALS BY USING FUNCTIONAL POLYMERS — IN BULK, ON SURFACES, OR AT PORE SITES

Dr. H. Samet Varol

July 13rd, 2022, from 10.00 a.m.

Politecnico di Torino - Corso Duca degli Abruzzi 24
Classroom Denina 1° Floor - DISAT

Registration form:
https://forms.office.com/r/mXUwLCXX6U

Wearing masks still reccomended

DR. H. SAMET VAROL

Short Bio:

Dr. H. Samet Varol received his MSc from Advanced Materials at Ulm University. He wrote his MSc thesis in the research group of Prof. K.Landfester at the Max Planck Institute for Polymer Research (MPIP-Mainz). In 2012, he started his PhD in the Molecular Spectroscopy Department of MPIP-Mainz, under the supervision of Prof. M.Bonn. After his PhD, he worked as a postdoctoral fellow in the same group for half a year. In 2018-2020, he worked as a postdoctoral fellow in the group of Prof. S.Seeger at the University of Zurich. Between 2020-2022, he worked as a postdoctoral fellow in the Smart Membranes Group of Prof. A.A.Brunsen in TU-Darmstadt. From Apr. 2022, he has been working on his independent project in TU-Darmstadt as a Career Bridging Fellow. Samet recently won a prestigious Feodor Lynen Fellowship from Alexander von Humboldt Foundation to perform his research at the University of Bologna for the next years.

ABSTRACT

In the history of producing stimuli-responsive materials, polymer technology has always been the primary choice. Therefore, in my talk, I will explain the importance of using functional polymers to produce materials in (i) nanocomposite, (ii) surface coating, and (iii) membrane applications. In the nanocomposite section, I will explain the role of molecular-level filler/polymer interaction and polymer chain alignment on the mechanics of the nanocomposites. In the surface coatings part of my talk, I will show how to architect different polysiloxane micro-and nanopatterns to make surfaces (super)antiwetting and introduce a new fluorescence staining method to study the liquid/polysiloxane interfaces. In the membrane section, I will discuss the role of the ligand-binding mechanism on ionic transport at the polymer functionalized hybrid nanopores. I will also introduce the recently won Alexander von Humboldt Fellowship project focusing on controlling ionic pore transport in flexible smart-gating membranes via mechano-gating.