

College of Engineering and Physics
Mechanical Engineering Department

An Introduction to Plasma-Chemical Kinetics

Speaker:

Dr. Ramses Snoeckx

Scientist & Project Leader

Plasma Technology for Energy and Environmental Solutions

Empa

Date: Wednesday: Sep 16, 2026

Time: 1:30 – 3:00 PM

Location: Building 63 – Room 362



Abstract:

This seminar introduces the fundamentals of plasma chemistry (and the tools available in literature), with a focus on how electron energy drives chemical reactivity in non-thermal plasmas. Participants will learn how the electron energy distribution function determines the fraction of energy transferred to different electron-impact processes, including attachment, vibrational excitation, electronic excitation, dissociation, and ionization. These processes generate a cocktail of reactive species that govern subsequent reaction pathways, highlighting how microscopic plasma-chemical kinetics influence macroscopic plasma process outcomes.

Bio:

Dr. Ramses Snoeckx is an interdisciplinary researcher developing sustainable solutions for the electrification and decarbonization of industrial processes at the interface of chemistry, physics, and engineering. He has been leading projects in the field of energy and environmental science at institutions such as KAUST and the ETH Domain, and has held visiting positions at University College London and Seoul National University. Currently, he serves as a Scientist and Project Leader at Empa, the Swiss Federal Laboratories for Materials Science and Technology.

Dr. Snoeckx is a pioneer in the non-equilibrium chemical kinetics and thermodynamics of electrically sustained reactive flows. By combining experiments and modeling, his research advances the underlying reactions of plasma processes for green applications. He received his PhD in Chemistry (2017) summa cum laude with the congratulations of the examination committee from the University of Antwerp and has written the reference work on plasma technology for CO₂ conversion.

In recognition of his early-career achievements in upcycling greenhouse gases, Dr. Snoeckx has been honored with the Young Investigator Award from the International Plasma Chemistry Society and the PSE Early Career Award from the European Committee on Plasma and Ion Surface Engineering.