

Il 4 Luglio 2022

alle ore 11.00

presso l'Aula Magna "Toraldò di Francia" dell'Edificio F
Area della Ricerca CNR di FIRENZE
Via Madonna del Piano 10, Sesto Fiorentino

il **Prof. Hyunwoong Park**
School of Energy Engineering
Kyungpook National University, Daegu
Repubblica di Corea

terrà il seguente seminario:

"Sunlight-Assisted Electrocatalytic CO₂ Conversion to Value Added
Chemicals Using Nanostructured Metals and Metal Oxides"

Si invitano tutti gli interessati a partecipare.

Dott. Lorenzo Zani
Ricercatore ICCOM

Dott. Francesco Vizza
Direttore ICCOM

Short Abstract:

Artificial photosynthesis of value-added chemicals from CO₂ and water has received renewed attention, and diverse technical solutions for high-efficiency and durability durable systems have been explored. Photoelectrochemical (PEC) systems have long been demonstrated to be technically viable with a number of semiconductor-photoanodes coupled to metal or metal oxide electrodes and photocathodes coupled to metal/metal oxide anodes. Although they are promising, however, these single absorbers (photoanode or photocathode) exhibit significantly lower efficiencies than the solar conversion limit and require external biases, primarily because of energy losses arising from overpotentials in the O₂-evolution and CO₂-reduction reactions. Recently, photovoltaic-assisted electrocatalytic (PV-EC) systems are considered alternatives to the conventional PEC systems while reporting significantly higher efficiencies than the PEC. In this study, we will show three types of photosystems (PEC, PV-EC, and PV-PEC tandem) with various metals and metal oxides electrodes synthesized in our group, and compare the systems in terms of solar-to-chemical conversion efficiency and durability. Finally, possible applications of the synthesized materials will be presented.

Biographic sketch:

Hyunwoong Park received a B.S. in Environmental Science at Hallym University in 1999 and a Ph.D. degree in Environmental Engineering at POSTECH (Pohang, Korea) in 2004. After postdoctoral research at the California Institute of Technology (Pasadena, California: 2006 – 2008), he moved to the School of Energy Engineering at Kyungpook National University (Daegu, Korea) as an assistant professor (2008) and was ten promoted to associate professor (2012) and full professor (2017). He has published over 170 papers in peer-reviewed journals, which have been cited over 13,700 times (h-index 60). He was awarded the Knowledge Creativity Award by the Ministry of Education, Science, and Technology, Korea (2012), the Best Paper Award by the Korean Electrochemical Society (2013), the SBS Foundation Fellow Award (2014), The Park Su-Moon Award of the Korean Electrochemical Society (2018), and the Kyungpook National University Academic Award (2018), and the Outstanding Reviewer Award for *Sustainable Energy & Fuels* (Royal Society of Chemistry, 2018). He served as the Editor of *Materials Science in Semiconductor Processing* (Elsevier, 2015-2019) and the Associate Editor of *Environmental Engineering Research* (Korean Society of Environmental Engineers, 2014-2018). He has served as the Editor of *Sustainable Horizons* (Elsevier) since 2021. He holds 13 patents.