

Korea-EU Horizon Europe Researchers Networking Forum on Energy & Advanced Mobility

Jimun Yoo

Teamleader

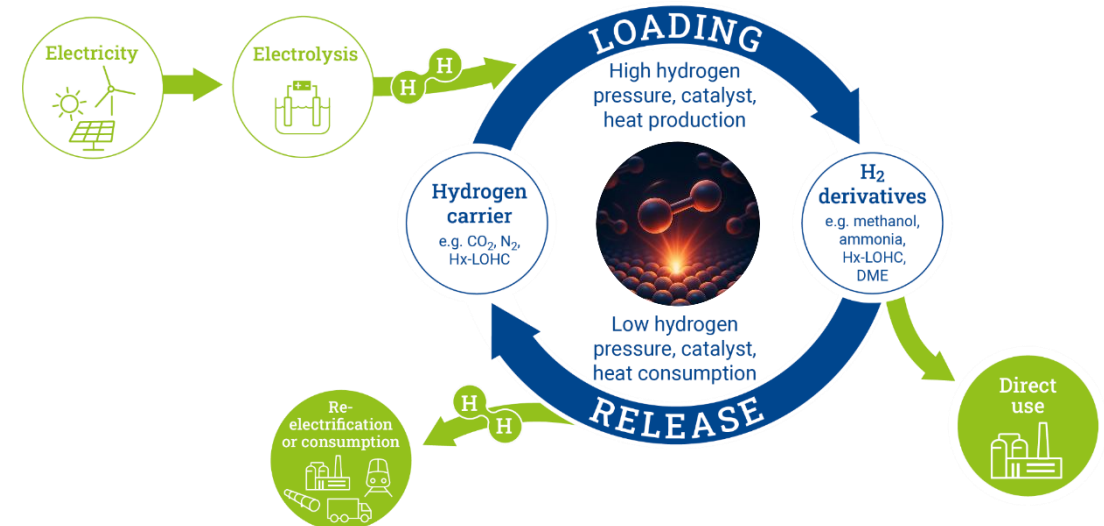
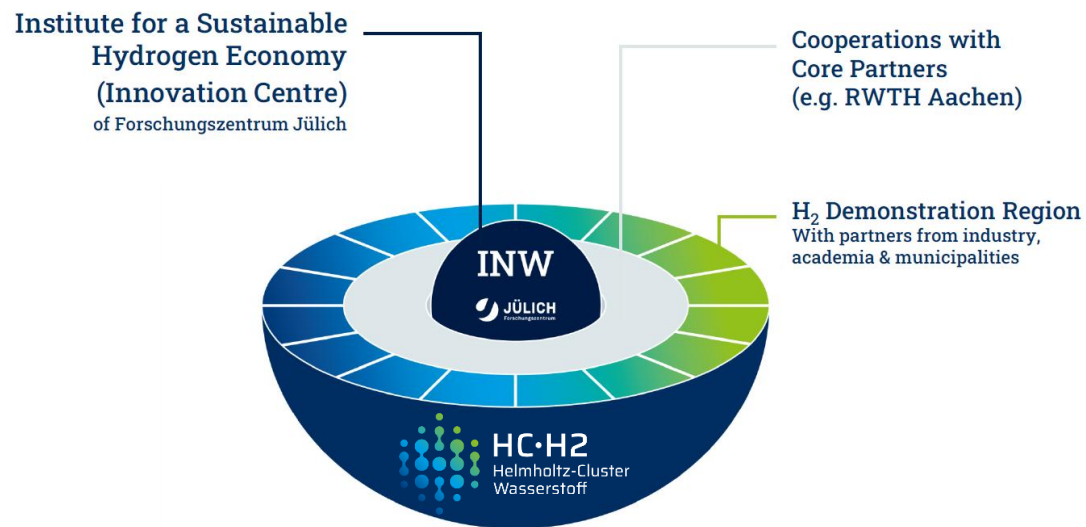
**Institute for a Sustainable Hydrogen Economy:
Catalytic Interface (INW-1) @ FZJ**

**Hydrogen, Battery,
Water Nexus**

1. Short Introduction of your Organization

Institute for a Sustainable Hydrogen Economy (INW)

- Helmholtz-Cluster Hydrogen (HC-H2): Largest *Structure Change* Project in NRW (~1 billion € funding until 2038)
- Hosted in Forschungszentrum Jülich (a part of Helmholtz Association): European largest interdisciplinary research center

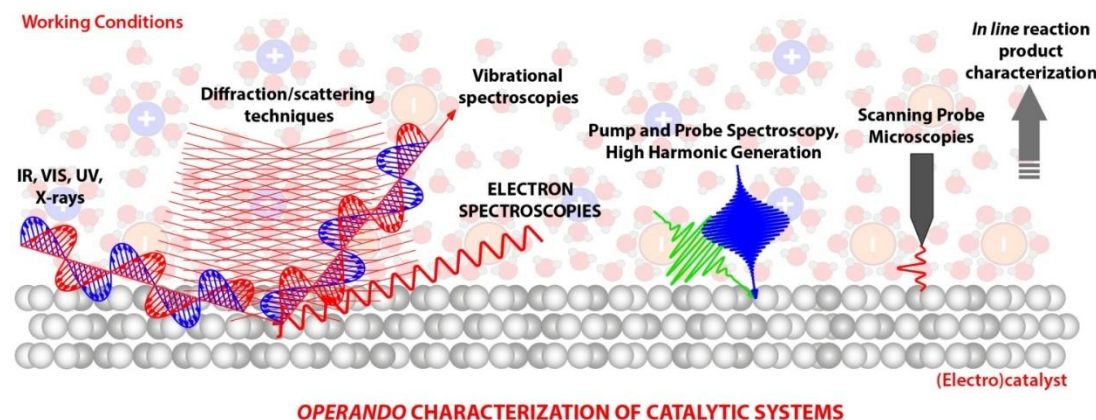
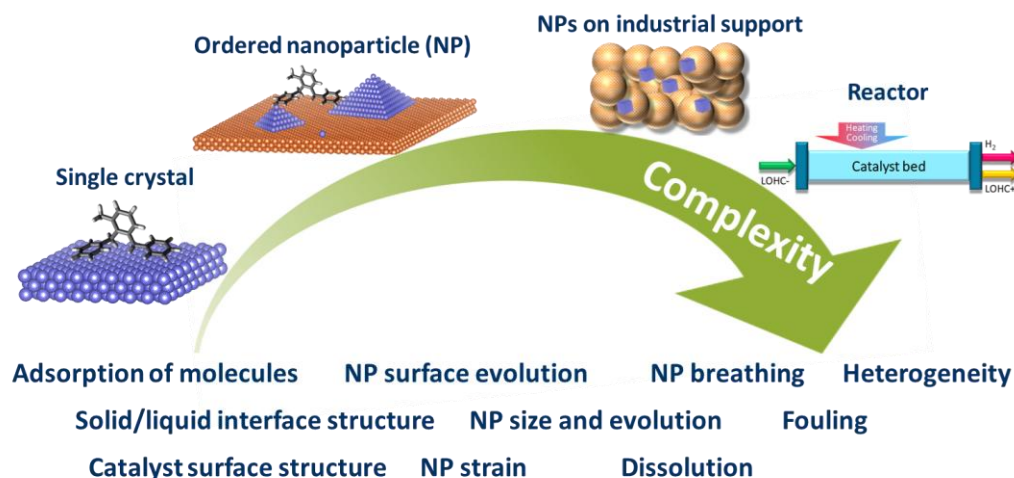


Chemical Hydrogen Storage through Catalysis

2. Expertise: *Operando* interface analyses

What do we want to achieve?

Cross-scale characterization of functional solid-molecule interface in *operando*



J. Phys. D: Appl. Phys. 2021, 54, 173001

Methods: X-ray scattering, spectroscopy, microscopy @ laboratory, synchrotron, FEL X-ray sources **under reaction conditions**

Foundational and scalable understanding across scales → Rational design of and new concepts for improved materials

3. Your Project Idea

Multi-modal *operando* characterization on electrified dynamic solid-liquid interface

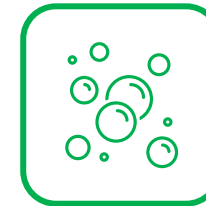
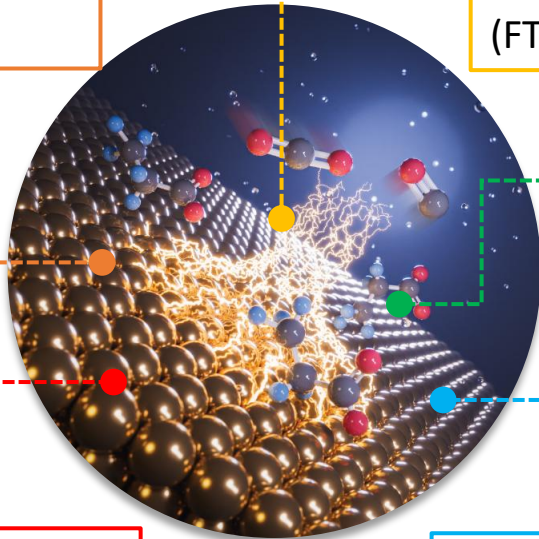
❖ **Electronic structure change**
: X-ray photoelectron/
absorption spectroscopy

❖ **Molecular intermediate**
: Vibrational spectroscopy
(FT-IR, Raman)

❖ **Local heterogeneity**
: Scanning probe microscopy
(AFM, TERS)

❖ **Atomic structure evolution**
: X-ray scattering/diffraction

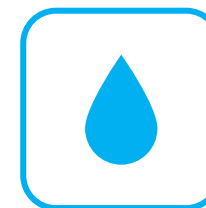
❖ **Degradation/Side reaction**
: Mass spectrometer



Hydrogen

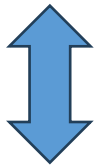
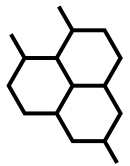


Battery



Water Nexus

Material



Device

5. Contact Details

❖ Institute for a Sustainable Hydrogen Economy: Catalytic Interface (INW-1)



Prof. Dr. Hans-Georg Steinrück
Director of INW-1
h.steinrueck@fz-juelich.de



Dr. Jimun Yoo
Teamleader, Catalytic Interface (INW-1)
j.yoo@fz-juelich.de