**Global Research Outreach\_2025\_Call for proposal**

**Theme: Next Generation Catalyst**

**- Sub-Theme: Adaptive Catalysts for Environmental Applications**

**Adaptive catalysts** represent an emerging class of materials capable of dynamically modulating their catalytic properties in response to external stimuli such as light, electric fields, temperature, pressure, and pH. This inherent adaptability presents a valuable opportunity to tune reaction pathways and switch between catalytic processes depending on operating conditions. Such flexibility has the potential to drive innovative solutions in complex and dynamic reaction environments commonly encountered in industrial settings.

**Environmental technologies** can particularly benefit from adaptive catalysts, which must maintain performance across diverse conditions - including varying energy sources, reactants, and climate scenarios.  To fully leverage this potential, in-depth mechanistic studies are required to identify and control the key gas-surface interactions that govern multiple reaction channels.

**This call** **seeks proposals** targeting advanced surface reaction processes and catalyst innovation, with the goal of establishing a 'one catalyst, multiple reactions' paradigm for next-generation catalysis.

Scope of Applicable Topics (Non-limiting Examples):

* Single Catalytic Systems for the Decomposition of Multiple Greenhouse Gas Species
* Chemical Dynamics Analysis in Plasma-Catalyst Coupled Systems
* Adaptive Catalysts for CO2 Conversion, Nitrogen Fixation, and Hydrogen Production from Various Feedstocks

※ *The topics are not limited to the above examples and the participants are*

*encouraged to propose the original idea.*

※ *Funding: Up to USD 150,000 per year*