

## Multi/Inter-Disciplinary Research Program Carbon-Neutral Energy-Fueled Society



CO<sub>2</sub> in Earth and Ocean

→ Production, Storage, and Distribution

→ Risk Management of CCS

**Efficient** Hydrogen **Storage Materials** 

Hydrogen Structural **Materials** (compatible with hydrogen)

**Next Generation Fuel Cells** (novel materials and devices)

**Optimum and Intelligent Material Transformations** (waste-free)

**Solar H Production Artificial Photosynthesis** 

> **Thermophysical** properties (H<sub>2</sub>, CO<sub>2</sub>)

**Storage** (long term

behavior of CO<sub>2</sub> stability)

CO<sub>2</sub> Separation

& Concentration

(low energy

separation)

CO, Geological

**Understanding Interface-gas reactions** 

absorption, adsorption, dissolution, diffusion, reaction, conduction, etc.

Matter **Spatial scale** molecular -- earth, ocean

Nanoseconds - - - decades

**Temporal scale** 

**Mechanics** 

Oceanic **Science** 

Macro

Geo-Science

CO, Ocean Sequestration (CO<sub>2</sub>/Oceanturbulence interaction)

Biomimetics

Chemistry

**Atomic** 

**Physics** 

Materials Science