Hiramatsu Lab.

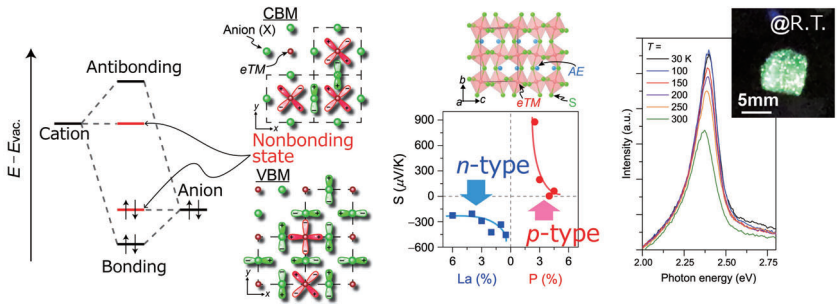
Creation of novel functional materials from ubiquitous elements and inorganic materials

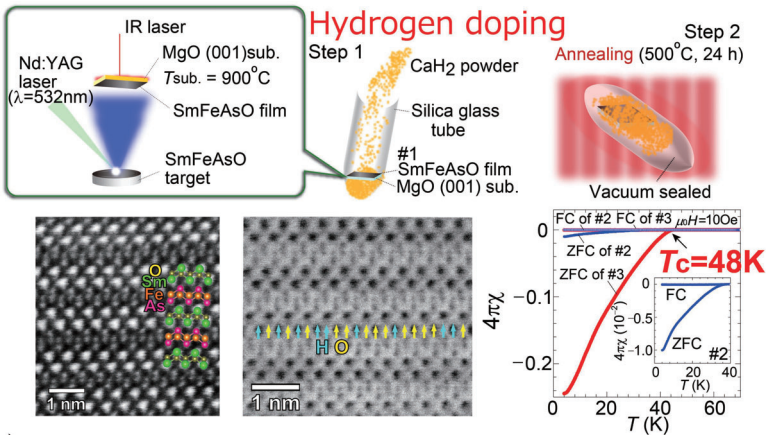
Division of Unexplored Materials Exploitation, Laboratory for Materials and Structures

http://www.msl.titech.ac.jp/member/profile/hiramatsu.html

- Creation of new materials based on original design concepts
- Origin and enhancement of T_c in Fe-based superconductors
- Materials design and exploration of functional semiconductors
- Detection and determination of role of hydrogen in solids

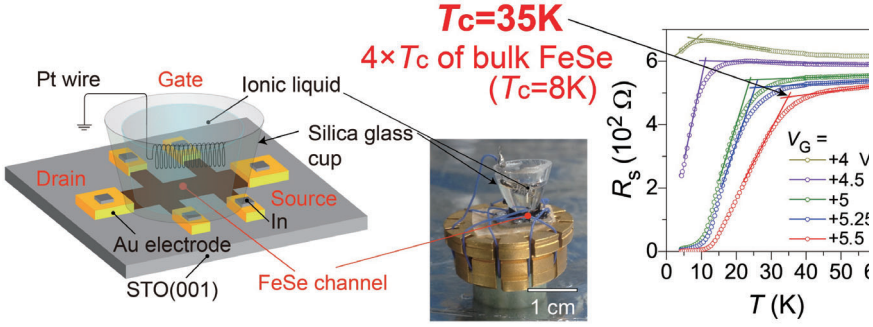
Our research target is to create new materials that drastically improve our society and/or trigger a hot trend in worldwide research.





H-doped Fe-based high-T_c superconductor epitaxial films

- Unique H-doping method
- Determination of H sites by STEM

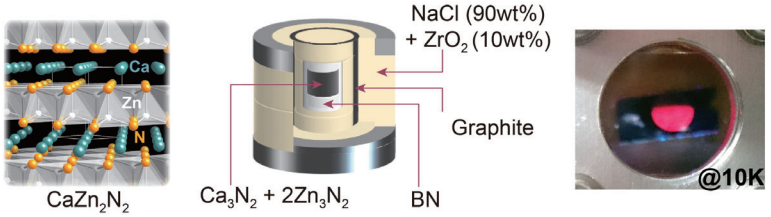


Field-induced high-T_c superconductivity using EDLT structure

- Extremely high-density carrier-doping with ionic liquid
- 4 times higher T_c than that of the bulk

Materials design of new light-emitting semiconductors

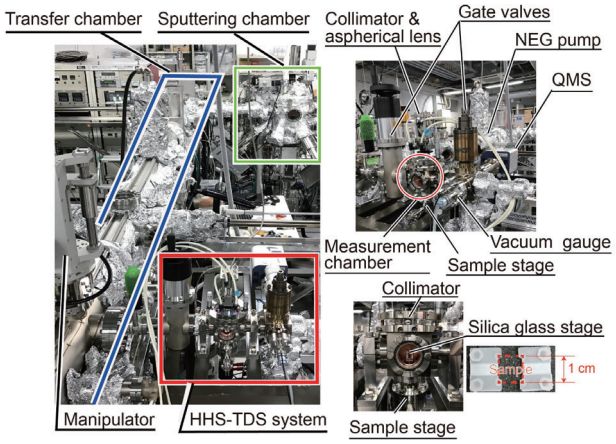
- Chemical design based on original concepts
- Validation from first-principles calculation & experiments



Novel nitride semiconductors for photovoltaic applications

- Exploration using materials informatics
- High-pressure synthesis

(Collaboration with Oba Lab.)



Highly hydrogen sensitive TDS

- Development of analysis instrument with the highest H-detectable sensitivity (Patent submitted)
- Examination of role of H in solids