

Theme : Functional Oxide

- Sub Theme : Oxide Thin Films for Device Applications

Materials innovation, especially in oxides, would lead to overcome present technological limits and even to develop new types of electronic applications. More recently, advanced thin film deposition techniques for complex oxides also enable to explore new physics and functionalities with atomically controlled interfaces where versatile electronic applications appear. Coherent growth of oxide heterostructures is most likely to introduce new interface effects, and hence suppress or enhance some of materials properties which may in turn provide technological breakthrough.

We are aiming to understand materials properties in oxide thin films and eventually find a pathway to improve device performances. With a great help of innovative ideas and comprehensive understanding it would be expected to get over issues currently raised in semiconductor device applications.

- Ultra high-k epitaxial or polycrystalline dielectric thin film ($k > 1,000$, except ferroelectricity)
- Structural and/or ferro-to-paraelectric phase transition of oxide thin film
- New interfacial effect in multilayered oxide thin films (strain, atomic interdiffusion etc.)
- Crystallization of oxide thin film at moderate temperature, 400-500°C
- New functional oxide thin film for device applications

※ The topics are not limited to the above examples and the participants are encouraged to propose original idea.

※ Funding : Up to USD \$150,000 per year