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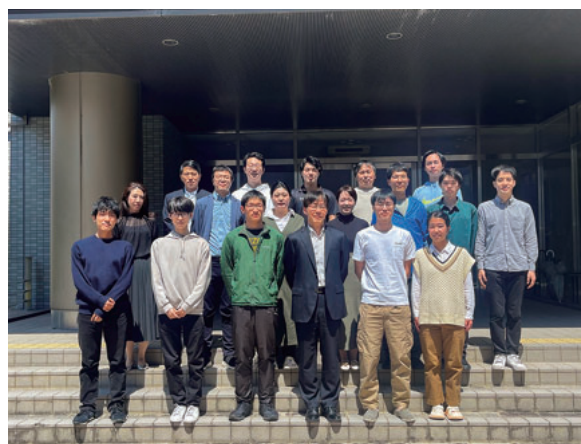
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Scope of Research

Transition metal oxides have a wide variety of interesting and useful functional properties, including electronic conduction, superconductivity, ferroelectricity, and ferromagnetism. In fact, some of these oxides are used in current electronic devices. Our research mainly focuses on perovskite-structured transition metal oxides with novel functional properties due to complex couplings between their lattices, charges and spins. We are currently exploring such functional oxides with advanced oxide-synthesis techniques such as high-pressure synthesis and epitaxial thin film growth.

KEYWORDS

Solid State Chemistry	Functional Metal Oxides
High Pressure Synthesis	Epitaxial Thin Film Growth
Heterointerface	



Recent Selected Publications

Shen, Y.; Ooe, K.; Yuan, X.; Yamada, T.; Kobayashi, S.; Haruta, M.; Kan, D.; Shimakawa, Y., Ferroelectric Freestanding Hafnia Membranes with Metastable Rhombohedral Structure down to 1-nm-thick, *Nat. Commun.*, **15**, 4789 (2024).

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Watanabe, R.; Goto, M.; Kosugi, Y.; Kan, D.; Shimakawa, Y., Oxygen Release and Incorporation Behaviors in BaFeO₃ Polymorphs with Unusually High-Valence Fe⁴⁺, *Chem. Mater.*, **36**, 2160-2112 (2024).

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