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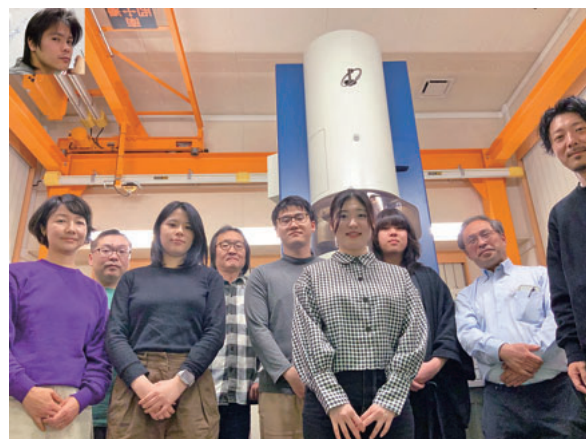
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Scope of Research

In the field of nanotechnology, the importance of high spatial resolution analysis of materials further increases. We study the structure and the electronic state of materials at atomic scale through direct imaging of atoms or molecules by (scanning) transmission electron microscopy ((S)TEM) combined with energy dispersive X-ray spectroscopy (EDS) and electron energy-loss spectroscopy (EELS), which gives the information of elemental and electronic state. And we are studying with the aim of establishing new analytical methods using electron microscopes and evaluating materials using these methods.

KEYWORDS

STEM
EELS
EDS
Elemental Mapping
Electronic State



Recent Selected Publications

Lin, I-C.; Haruta, M.; Nemoto, T.; Kurata, H., Isotropic Behavior of Oxygen Vibrations in PbTiO_3 Investigated by $\text{Ti L}_{2,3}$ -Edge Electron Energy-loss Spectroscopy, *Phys. Rev. B.*, **110**, [035109-1]-[035109-8] (2024).

Lin, I-C.; Haruta, M.; Nemoto, T.; Goto, M.; Shimakawa, Y.; Kurata, H., Extraction of Anisotropic Thermal Vibration Factors for Oxygen from the $\text{Ti L}_{2,3}$ -Edge in SrTiO_3 , *J. Phys. Chem. C.*, **127**(36), 17802-17808 (2023). Supplemental cover

Iwashimizu, C.; Haruta, M.; Nemoto, T.; Kurata, H., Different Atomic Contrasts in HAADF Images and EELS Maps of Rutile TiO_2 , *Microscopy*, **72**(4), 353-360 (2023). Editor's Choice

Haruta, M.; Kikkawa, J.; Kimoto, K.; Kurata, H., Comparison of Detection Limits of Direct-Counting CMOS and CCD Cameras in EELS Experiments, *Ultramicroscopy*, **240**, [113577-1]-[113577-6] (2022).

Haruta, M.; Nemoto, T.; Kurata, H., Sub-picometer Sensitivity and Effect of Anisotropic Atomic Vibrations on $\text{Ti L}_{2,3}$ -Edge Spectrum of SrTiO_3 , *Appl. Phys. Lett.*, **119**, [232901-1]-[232901-5] (2021). Featured Article