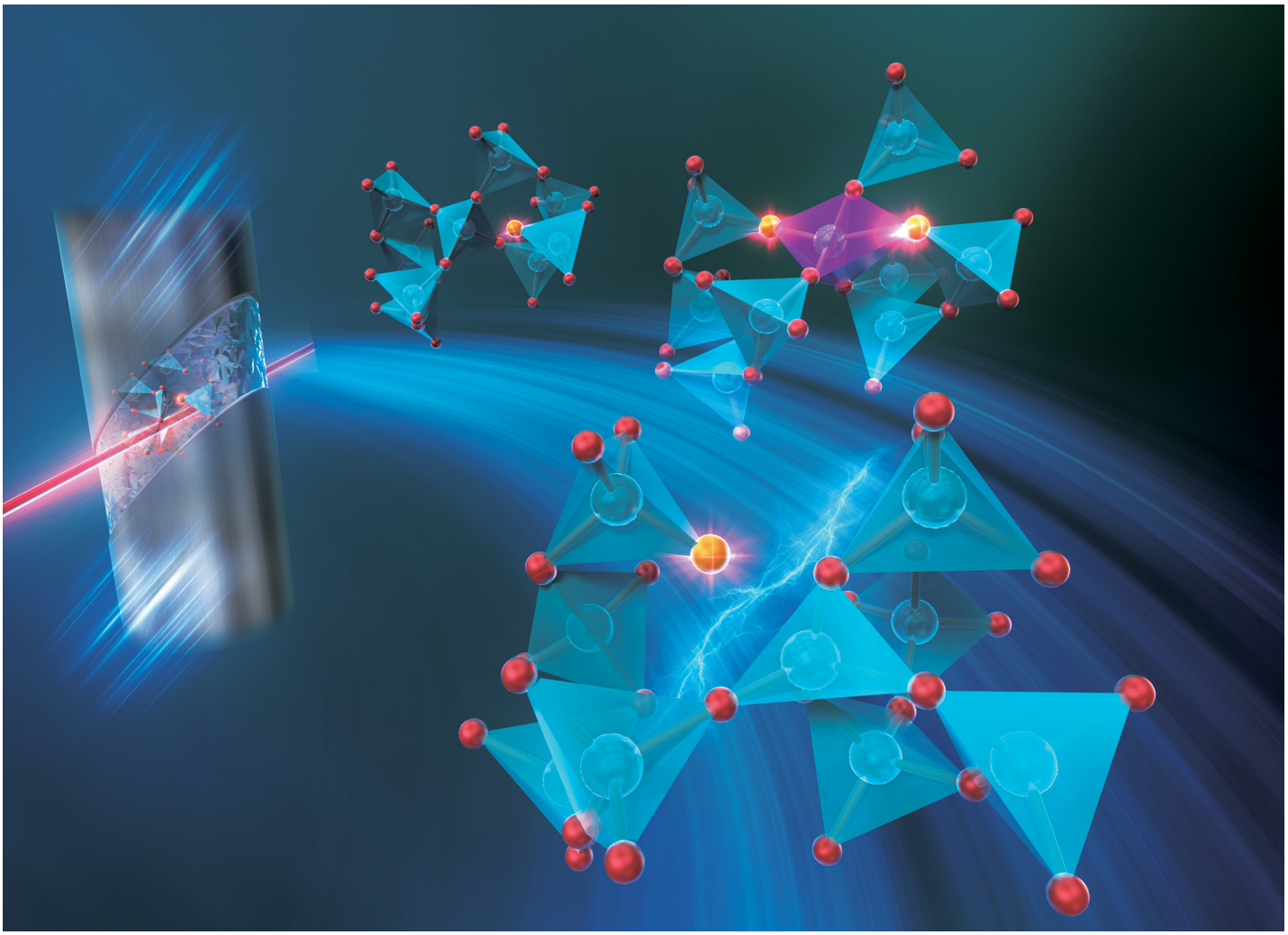

Showcasing research from Ceramics Materials Laboratory, Department of Materials Chemistry, The University of Shiga Prefecture, Hikone, Japan.

Deformability of Mg–aluminosilicate glass under high pressure and shear stress: dynamic coordination change of Al^{3+}

Room-temperature flow strongly influences glass deformation and fracture, but its atomic-scale mechanism has been difficult to probe experimentally. By combining shear deformation under confining pressure with multi-probe analyses using electromagnetic radiation from microwaves to X-rays, we found evidence that flow in high-strength aluminosilicate glass involves dynamic rearrangement of AlO_4 tetrahedra through transient higher-coordinated states. This provides new insight into the atomic mechanisms underlying glass deformation and fracture.

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