



Beitrag ID: 73

Typ: **Invited talk**

## Ruthenium-Chlorine hybridization in $\alpha$ -RuCl<sub>3</sub>

*Mittwoch, 8. Oktober 2025 09:00 (30 Minuten)*

In the last decade,  $\alpha$ -RuCl<sub>3</sub> has been extensively studied as a possible realization of the Kitaev quantum spin liquid state. However, the Kitaev model alone is insufficient to describe the magnetism in the material, and additional off-diagonal terms and Heisenberg interactions are known to be present. In addition, it is necessary to account for longer-range interactions arising from the itinerant aspect of electrons in this system. It has been known for some time that third-neighbour interactions are required to stabilize the zigzag magnetic order in this system. A recent modelling of the neutron magnetic form factor also found a substantial hybridization of Ru and Cl ions. In order to directly probe the role of chlorine in the magnetic ground state of  $\alpha$ -RuCl<sub>3</sub>, we have carried out resonant elastic X-ray scattering (REXS) measurements at the Cl K-edge. We observed resonant enhancement of the magnetic Bragg peaks, indicating the presence of a magnetic moment on the Cl site. The temperature dependence of the resonant Bragg peaks matches that of the Ru edge, suggesting a similar magnetic origin. Our measurements provide evidence for the importance of Cl covalency to magnetism in  $\alpha$ -RuCl<sub>3</sub>.

**Autoren:** HORSLEY, Ezekiel (University of Toronto); WANG, Jiaming (University of Toronto); KIM, Subin (University of Toronto); SEARS, Jennifer (Brookhaven National Laboratory); FRANCOUAL, Sonia (DESY); NELSON, C. S. (Brookhaven National Laboratory); KIM, Young-June (University of Toronto)

**Vortragende(r):** KIM, Young-June (University of Toronto)

**Sitzung Einordnung:** Frustrated spin systems

**Track Klassifizierung:** Frustrated spin systems