

# Magnetic Ordering in $Ba_3RRu_2O_9$ ( $R = Tb, Tm$ )

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The Ru-based compounds are always interesting to study due to the spatially extended  $4d$ -orbitals and substantial spin-orbit coupling leading to a variety of interesting physical properties, like quantum spin liquid and orbital ordering [1,2]. The study becomes further interesting by combining Ru with rare earths ( $R$ ) owing to the interactions between  $4d$  and  $4f$  electrons leading to a complex magnetic order. Among the various  $4f$ - $4d$  systems, the  $Ba_3RRu_2O_9$  family of compounds have gained special interest owing to their diverse magnetic ground states ranging from ferromagnetic to antiferromagnetic depending upon the  $R$  atom [3,4]. In this talk, I will discuss magnetic ordering in polycrystalline  $Ba_3RRu_2O_9$  ( $R = Tb$  and  $Tm$ ) compounds using microscopic techniques of neutron diffraction and muon spin relaxation (MuSR), including their crystal structures, magnetometry results, and potential applications.

## References

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