



Contribution ID: 68

Type: Oral

## Imprinted emergent textures in amorphous rare-earth transition-metal ferrimagnets

*Tuesday, 7 October 2025 09:35 (25 minutes)*

Amorphous rare-earth transition-metal (RE-TM) ferrimagnets are workhorse materials in the field of spintronics. Developed chiefly for magneto-optical recording and bubble memories in the second half of the 20th century, they have remained at the forefront of the field, for example because they allow for ultrafast all-optical switching<sup>1</sup>, ultrafast current-driven domain wall motion<sup>2</sup>, and easy, gradual tuning from ferromagnetic to antiferromagnetic behavior. However, these materials are also known to exhibit chemical heterogeneity, both laterally<sup>3</sup> and in thickness direction<sup>4</sup>, as well as sperimagnetism<sup>5</sup>, i.e., intrinsically non-collinear alignment of spins. So far, these effects were largely ignored in spintronics research.

Here, we report on the discovery of emergent textures in the structure of amorphous RE-TM ferrimagnets (Fig. 1), which are imprints the magnetic domains walls of the as-grown state and can be traced back to long-range-ordered patterns of chemical heterogeneity and sperimagnetism. The nature and implications of these imprinted emergent textures are revealed by resonant x-ray scattering and imaging experiments, in concert with advanced transmission electron microscopy and scanning probe microscopy, as discussed in this talk.

**Primary authors:** BUETTNER, Felix (Helmholtz-Zentrum Berlin & University of Augsburg); KARAMAN, Tamer (University of Augsburg)

**Co-authors:** ULLRICH, Aladin (University of Augsburg); MANDRU, Andrada-Oana (Empa Switzerland); PFAU, Bastian (MBI Berlin); KLOSE, Christopher (MBI Berlin); METTERNICH, Daniel (Helmholtz-Zentrum Berlin & University of Augsburg); PÉREZ SALINAS, Daniel (ALBA Synchrotron); HUG, Hans J. (Empa Switzerland); LLOBET, Jordi (ALBA Synchrotron); LITZIUS, Kai (University of Augsburg); SAMWER, Konrad (University of Göttingen); PATRA, Manas (Helmholtz-Zentrum Berlin & University of Augsburg); ALBRECHT, Manfred (University of Augsburg); VALVIDARES, Manuel (ALBA Synchrotron); SCHNEIDER, Michael (MBI Berlin); PEREMADATHIL PRADEEP, Reshma (Empa Switzerland); BATTISTELLI, Riccardo (Helmholtz-Zentrum Berlin & University of Augsburg); SCHMIDT, Timo (University of Augsburg)

**Presenter:** BUETTNER, Felix (Helmholtz-Zentrum Berlin & University of Augsburg)

**Session Classification:** Talks Tuesday Morning