

# On-line SPICE-SPIN+X Seminars



**Wednesday, 24th February 2021, 15:00 (German Time)**

The seminar will be via Zoom ([Meeting ID: 812 8992 1605](#)) and live streamed in the SPICE YouTube Channel.



**Sergej O. Demokritov,**

*Münster University*

## **Spatio-Temporal Dynamics of Magnon Bose-Einstein Condensates**

Recent advances in the studies of magnon gases have opened new horizons for the deep understanding of physics of room-temperature macroscopic coherent states including Bose-Einstein condensates of magnons. Although this phenomenon was discovered almost 15 years ago, a lot of important issues associated with the magnon Bose-Einstein condensation still remain unclear. Here I review the recent experimental achievements in the investigations of this phenomenon. I show that magnon condensates are characterized by high degree of temporal and spatial coherency, which enables, for instance, observation of the interference of two condensates in the real space. Discovery of the second sound in magnon condensates is also discussed. I also address the dynamics of the condensate in inhomogeneous time-varying external fields. I show that this approach allows one to implement a magnon laser, which can generate a freely propagating cloud of coherent magnons, as well as to separate in the real space degenerate condensates corresponding to two opposite wavevectors. These studies also allowed us to answer the long-standing question concerning the physical origin of the spatial stability of the condensate. Finally, I examine the applicability of the spin-current paradigm for description of magnon condensates.