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### **Resonant dynamics of topological magnetic structures**

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A variety of topological magnetic structures have recently been observed and discussed in atomic structures. Examples are spin ices in pyrochlore lattices [1], or skyrmion lattices [2] in helical magnets, such as MnSi. Underlying these structures are competing interactions, which cannot all be simultaneously minimized. Patterned magnetic nanostructures can be engineered to have competing interactions that give rise to frustration, which can enable the formation of topological magnetic structures on the nanoscale and at room temperatures that can rather conveniently be observed [3-5]. In addition to interesting ground states or metastable states, the resonant dynamics of topological structures can be very interesting and different from the dynamics of the non-topological states [6-8]. This leads to the possibility of changing the resonant dynamics in magnetic system rather dramatically both in frequency and space by small variations in a control parameter. In this introductory talk of the symposium, I will give examples of such states and the ensuing dynamics, and discuss possible future directions and applications.

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