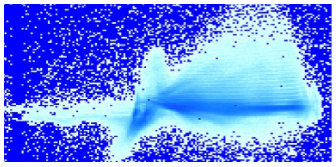

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MAX IV

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Coexisting Multi-Timescale Fluctuations at the Chiral Nematic Phase Boundary in Amorphous FeGe

Spatiotemporal correlations stabilize exotic phases of quantum materials. Here I present recent results from resonant soft coherent scattering experiments on the Smectic-like to Nematic-like phase transition in amorphous $Fe_{51}Ge_{49}$. By combining synchrotron measurements from the Advanced Light Source and free electron laser measurements from the Linearly Coherent Light Source, we have found a region of instability as a precursor to the Nematic-like phase where fluctuations coexist on the timescale of both minutes and subnanoseconds. These results emphasize the general nature of multi-step and multi-time scale topological phase transitions and are likely applicable to a broad class of materials and phenomena.

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