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Little and Large:Topological Defects in Cosmology and Condensed Matter Theory SINEAD GRIFFIN, Materials Research Laboratory, UC Santa Barbara, RAY RIVERS, Department of Physics, Imperial College London — Cosmology and condensed matter theory seem to be worlds apart, and yet are ubiquitously linked. Testing our current understanding of phenomena that occur on galactic scales can now be realized in the laboratory. The coming-together of cosmology and condensed matter theory is facilitated by the phase transitions and defect formation that is common to both areas. A recurring question in cosmology has concerned whether the vacuum is empty or contains vortex-strings or other topological defects. Understanding the formation and evolution of these topological defects plays a significant role in our understanding of cosmology and the early universe. Condensed matter systems provide an important starting point to studying the phenomena of phase transitions and the formation of topological defects. In both the cosmological and condensed matter scenarios, symmetry breaking causes a change to a degenerate vacuum manifold with non-trivial topology. This occurrence will be discussed along with experimental results in superfluid Helium and superconductors.

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