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Phase nucleation in curved space LEOPOLDO GÓMEZ, NICOLÁS GARCíA, Department of Physics, Universidad Nacional del Sur-CONICET. Argentina., VINCENZO VITELLI, Instituut-Lorentz, Universiteit Leiden, The Netherlands., JOS LORENZANA, Institute for Complex Systems, Consiglio Nazionale delle Ricerche, Italy, VEGA DANIEL, Department of Physics, Universidad Nacional del Sur-CONICET. Argentina. — Nucleation and growth is the dominant relaxation mechanism driving first-order phase transitions. In two-dimensional flat systems, nucleation has been applied to a wide range of problems in physics, chemistry and biology. Here we study nucleation and growth of two-dimensional phases lying on curved surfaces and show that curvature modifies both critical sizes of nuclei and paths towards the equilibrium phase. In curved space, nucleation and growth becomes inherently inhomogeneous and critical nuclei form faster on regions of positive Gaussian curvature. Substrates of varying shape display complex energy landscapes with several geometry-induced local minima, where initially propagating nuclei become stabilized and trapped by the underlying curvature (Gómez, L. R. et al. Phase nucleation in curved space. Nat. Commun. 6:6856 doi: 10.1038/ncomms7856 (2015).).

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