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Simulations of Thermal Fluctuations in Nuclear Pasta MATTHEW CAPLAN, Illinois State University — We report on recent molecular dynamics simulations studying thermal fluctuations in nuclear pasta in the inner crusts of neutron stars. Large scale simulations of 'lasagna' at a range of temperatures have resolved power law fluctuations in surface curvature and a first-order melting phase transition to a disordered phase. We also resolve topological fluctuations in the pasta at temperatures slightly below the melting temperature which may have implications for annealing pasta as the neutron star cools following a supernova. These results may constrain the maximum size of 'domains' in nuclear pasta and may have implications for the transport properties and shear moduli of the inner crust.

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