Nuclear Pasta

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A supernova is a dramatic event that in a fraction of a second transforms the 10^{55} separate nuclei that form the core of a massive star into a single large nucleus, a neutron star. Between the crust and the core of a neutron star, matter reaches such large densities, 10^{13} to 10^{14} g/cm³, that what were initially spherical nuclei merge and rearrange themselves into exotic shapes such as sheets, cylinders and others. Because of the resemblance of some of these shapes to spaghetti and lasagna these phases of matter are collectively known as nuclear pasta. We use molecular dynamics (MD) simulations to study the transitions between the different pasta shapes as the density of matter decreases from uniform to much lower densities where nuclei become spherical again.

Link to video

https://iu.app.box.com/s/ylzbtjqpbs0jnixft5vq

Preview is low-resolution. Please download the file for full resolution.