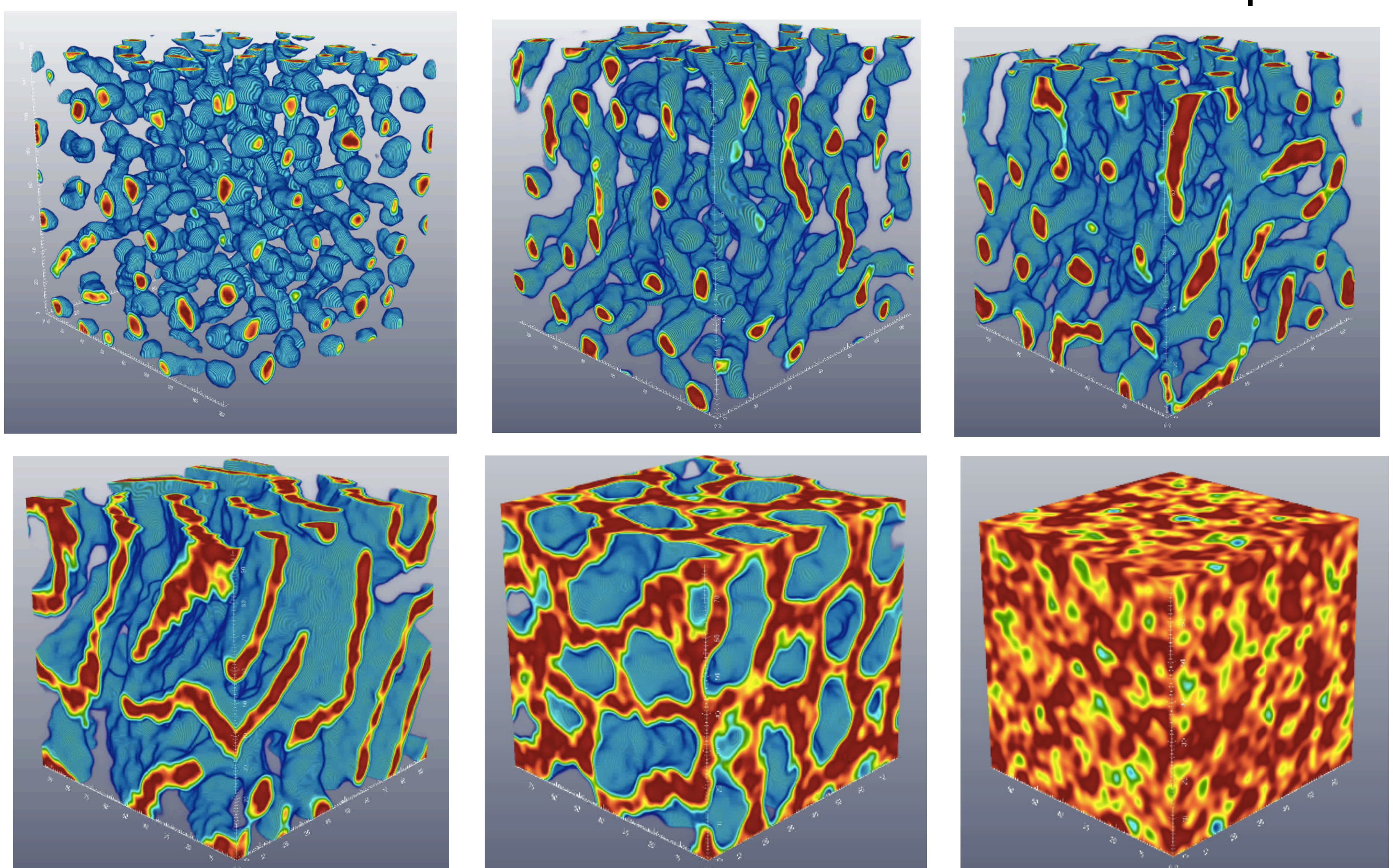
Large scale MD simulations of nuclear pasta formation: Nuclear reactions that make a neutron star

Objectives:

- Determine how core of massive star, during supernova, transforms from 10^{55} separate nuclei into a single large nucleus --- a newly formed neutron star.
- Study large-scale shape oscillations associated with formation of exotic nuclear pasta phases.

Impact:

- Determine time scales for large-scale nuclear shape changes.
- Guidance for multifragmentation and other heavy-ion reactions.
- Determine many transport properties important in astrophysics.



Accomplishments:

- Performed MD simulations with $\leqq$ 300,000 nucleons.
- Directly determined time scales for different nuclear pasta shape changes.

Reference: A. Schneider et al., to be published.

Contact: C. Horowitz
horowit@indiana.edu

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