

Questions for Nov 20, 2013

1. What is the liquid drop model? Why is it called so? Why were the asymmetry and pairing terms not included? What would change if they were included? **Nick**
2. It is well known that the liquid drop model has a lot of limitations in describing nuclear structure. How then can we rely on it to describe neutron star matter? What are its limitations for describing nuclear pasta? **Shamim**
3. What is nuclear saturation density? How does the neutron star density compare to the saturation density? **Arbin**
4. What traps the neutrinos in the neutron star core? **Brian**
5. What was the motivation for them to try these shapes (sphere, cylinder, plane, etc.) and not any other? Are there any other possible shapes? **Tyler**
6. What is the meaning of fractional dimension? For fractional dimension, do you get shapes which are intermediate between two shapes, or do you get both shapes in different locations? **Linda**
7. How do more recent results on phases of neutron star matter compare to the ones presented in this paper? **Sushil**
8. Is nuclear pasta a characteristic of neutron stars only or can it exist in other stars and supernovae? Can these phases be reproduced in the lab? **Andrea**
9. What happens at finite temperature? Do we also need to consider the entropy while minimizing the energy? **Cody**
10. Since the energies of these structures is only $\Delta E \sim 10^{-2}$ MeV/fm³ above that of uniform nuclear matter, shouldn't we expect their effects to be unimportant? **Norman**
11. The authors neglected the screening of the Coulomb interaction by the electrons. Is this a valid approximation? Why or why not? **Constantinos**