SFB/TRR 21 - Colloquium

9. Januar 2015, Ulm

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Superfluidity and thermal properties in the crust of neutron stars

In this talk, I will illustrate some interesting features related to superfluidity in non-uniform systems, such as those existing in the crust of neutron stars. The crust of neutron stars is indeed composed of very neutron rich nuclei immersed in a superfluid neutron gas. These peculiar systems are very interesting since they are the most extreme nuclear clusters existing in the universe. They cannot be synthesized on earth, but some of their properties could be probed in nuclei at the limit of stability, also called drip line nuclei. The presence of these nuclear clusters in the crust of neutron stars influence its cooling, and I will illustrate the important role of resonances and the pairing re-entrant phenomenon at finite temperature which is predicted for some of those nuclei.

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