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Abstract for an Invited Paper  
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**From neutron-rich nuclei to low-mass neutron stars**

ATSUSHI TAMII<sup>1</sup>, RCNP, Osaka University

In the first part of this talk, Atsushi Tamii will discuss on the experimental determination on the equation of state (EOS) of neutron rich nucleonic matter, especially on the symmetry energy term and its density dependence at around the nuclear saturation density. A special focus is placed on the precise measurements of the neutron density distribution in neutron rich nuclei as well as the neutron skin thickness, electric dipole polarizability, and pygmy dipole resonance. In the second part of this talk, Kei Iida would like to discuss condensed matter aspects of neutron star matter, particularly matter in the crustal portion of neutron stars. In this portion, with increasing depth, nuclei present become more and more neutron rich in the presence of a neutralizing background of electrons, and eventually drip neutrons. These nuclei and free neutrons, which can be regarded as a liquid-gas mixture of nuclear matter, play a role in controlling various properties as astrophysical condensed matter. These properties include a peculiar lattice structure of nuclei, superfluidity of dripped neutrons and vortices in this lattice, and liquid crystalline structures of the liquid-gas mixture in the deepest region of the crust. Near normal nuclear density, the system melts into uniform nuclear matter, of which the EOS controls the mass-radius relation of low-mass neutron stars. This EOS is thus expected to be constrained from possible simultaneous determinations of neutron star masses and radii.

<sup>1</sup>Kei Iida (Kochi University) is the second author.