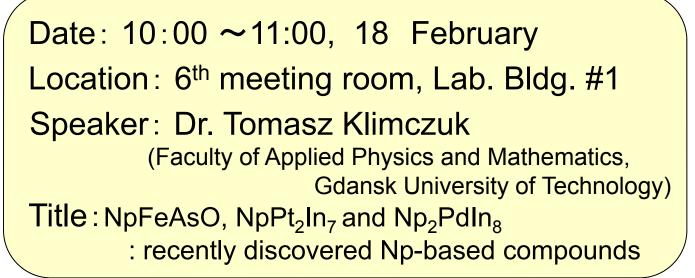
583rd ASRC Seminar



NpFeAsO, is one of the few actinide-based iron-oxypnictide compounds. Although one may expect the physical properties of NpFeAsO to be similar to the lanthanide 1111 analogues, in reality this system behaves differently. In particular, we do not observe any structural transition, in agreement with the absence of the high-temperature anomalies associated with an in-plane magnetic ordering in the Fe-As layer. The temperature-dependent magnetic susceptibility, electrical resistivity, Hall coefficient, and specific-heat measurements reveal a long-range magnetic order below a critical temperature $T_N = 57$ K. Below T_N , powder neutron diffraction and the Mossbauer spectroscopy measurements reveal an antiferromagnetic structure of the Np sublattice, with an ordered magnetic moment of $1.70 \pm 0.07 \mu_B$ aligned along the crystallographic *c* axis.

The neptunium analogues of the CePt₂In₇ and Ce₂PdIn₈ layered intermetallic compounds have been synthesized and characterized by means of resistivity, magnetic susceptibility and heat capacity techniques. Rietveld analysis of the powder x-ray diffraction patterns of NpPt₂In₇ and Np₂PdIn₈ confirm tetragonal structure type for both compounds, with lattice parameters similar to the previously reported for CePt₂In₇ and Ce₂PdIn₈, respectively.

For NpPt₂In₇ an antiferromagnetic transition was observed with the Néel temperature $T_N = 23 \text{ K}$. Rather complex magnetism is revealed for Np₂PdIn₈ with ferromagnetic and possibly antiferromagnetic transitions at $T_C = 9.5 \text{ K}$ and $T_N = 8.5 \text{ K}$, respectively. For both NpPt₂In₇ and Np₂PdIn₈ a Curie-Weiss fit of the high-temperature magnetic susceptibility curve, $\chi(T)$, gives an effective magnetic moment as expected for trivalent Np.



<Contact> Shinsaku Kambe (81-3525) Advanced Science Research Center

