

# Lie Groups and Representation Theory Seminar at the University of Tokyo

## リー群論・表現論セミナー

- DATE May 22 (Tue), 2007, 16:30–18:00
- PLACE Room 126, Graduate School of Mathematical Sciences
- SPEAKER **Chifune Kai** (甲斐千舟) (Kyushu University)
- TITLE A characterization of symmetric cones by an order-reversing property of the pseudoinverse maps
- ABSTRACT When a regular open convex cone is given, a natural partial order is introduced into the ambient vector space. If we consider the cone of positive numbers, this partial order is the usual one, and is reversed by taking inverse numbers in the cone. In general, for every symmetric cone, the inverse map of the associated Jordan algebra reverses the order. In this talk, we investigate this order-reversing property in the class of homogeneous convex cones which is much wider than that of symmetric cones. We show that a homogeneous convex cone is a symmetric cone if and only if the order is reversed by the Vinberg's  $*$ -map, which generalizes analytically the inverse maps of Jordan algebras associated with symmetric cones. Actually, our main theorem is formulated in terms of the family of pseudoinverse maps including the Vinberg's  $*$ -map as a special one. While our result is a characterization of symmetric cones, also we would like to mention O. Güler's result that for every homogeneous convex cone, some analogous pseudoinverse maps always reverse the order.