Pathways Lecture Series in Mathematics, KEIO

Speaker: Prof. Alan David Weinstein
(University of California, Berkeley)

Place: Raiosha, Symposium Space
Hiyoshi Campus, KEIO University

Lecture 1 10:00 ~ 11:00 May 31, 2006 (Wednesday)
Lecture 2 10:00 ~ 11:00 June 1, 2006 (Thursday)
Lecture 3 10:00 ~ 11:00 June 2, 2006 (Friday)

Group(oid)-like objects in Poisson geometry and algebra

A group is a set $G$ with a product mapping $m: G \times G \to G$, a unit mapping $e$ from a one point set to $G$, and an inversion mapping $i$ from $G$ to itself, satisfying associativity and the axioms for the unit and inverses.

By replacing $G$ by an object with another structure (e.g. Poisson manifold, differentiable stack, or associative algebra), and the mappings $m, e, i$ by mappings appropriate to this structure (sometimes going in the "wrong direction"), we obtain a wide variety of "group-like" objects. All of the above is true for groupoids as well. As a consequence, it is possible to integrate any Lie algebroid to a Lie groupoid in the world of differentiable stacks, and we can put a group-like structure on an irrational rotation algebra which plays the role of polynomial functions on the quotient of the circle by a dense cyclic subgroup.

In these lectures, we will start by explaining the basic notions of (symplectic) groupoid, differentiable stack, and Hopf algebra, and will develop the theory of group-like differentiable stacks, along with the dual notion of hopfish algebra.

REFERENCES:
