THE UNIVERSITY  OF HONG KONG

Institute of Mathematical Research
Department of Mathematics

COLLOQUIUM

G_2 and the Rolling Ball

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Abstract

Finding concrete models for exceptional groups has been a goal in mathematics since their discovery. Here we describe a model of the smallest exceptional group, G_2, essentially due to Cartan: Locally, it gives the symmetries of one ball rolling on a fixed ball without slipping or twisting, but only when the balls have ratio of radii 1:3 or 3:1. We use the octonions to construct a similar, but more global picture of G_2: it is the symmetry group of a 'spinorial ball' rolling on a projective plane, again when the ratio of radii is 1:3 or 3:1, and we use the geometry of this system to explain this mysterious ratio.

Date:	**May 2, 2013 (Thursday)**
Time:	**4:00 – 5:00pm**
Place:	**Room 210, Run Run Shaw Bldg., HKU**

All are welcome