

**I-day** : Introductory workshop  
Room 7323, KIAS

December 23, 2013

**11:00**

**Taechang Byun (University of Seoul)**

**Title.** The geometry of  $SO(n)\backslash SO_0(n,1)$

**Abstract.** The Lie group  $SO_0(n,1)$  has the left-invariant metric coming from the Killing-Cartan form. The maximal compact subgroup  $SO(n)$  of the isometry group acts from the left and right. The geometry of the quotient space of the homogenous submersion  $SO_0(n,1) \rightarrow SO(n)\backslash SO_0(n,1)$  is investigated. It is a beautiful space with many symmetries. The space is expressed as a warped product. Its group of isometries, geodesics, and sectional curvatures are calculated.

**14:00**

**Ji Young Kim (Seoul National University)**

**Title.** The strictly regular quaternary quadratic  $\mathbb{Z}$ -lattices

**Abstract.** A positive definite quadratic  $\mathbb{Z}$ -lattice is said to be *strictly regular* if it primitively represents all positive integers that are primitively represented by its genus. In this talk, it will be shown that there exist only finitely many isometry classes of primitive integral positive definite quaternary quadratic  $\mathbb{Z}$ -lattices that are strictly regular.

**14:50**

**Jaewoong Kim (Seoul National University)**

**Title.** Introduction to the invariant subspace problem

**Abstract.** I will talk about the invariant subspace problem, which is the most famous problem in operator theory, and show partial results on that.

**16:00**

**Joonhyung Kim (Konkuk University)**

**Title.** On complex and quaternionic hyperbolic Fuchsian groups

**Abstract.** In the beginning of my talk, I will introduce the complex/quaternionic hyperbolic geometry. And then, I'll give the characterization of Fuchsian groups acting on complex/quaternionic hyperbolic spaces.

**16:50**

**Hwayoung Lee (Seoul National University)**

**Title.** Local Donaldson Thomas theory on  $G\text{-Hilb}(\mathbb{C}^2) \times \mathbb{P}^1$

**Abstract.** I will start from discussing what is a DT theory and then introduce our work as follows. The quotient space of complex plane  $\mathbb{C}^2$  with  $G$ -action where  $G$  is a finite subgroup of  $SL_2(\mathbb{C})$  has a mild singularity at  $(0,0)$ . It is known that this quotient space  $\mathbb{C}^2/G$  has a resolution  $G\text{-Hilb}(\mathbb{C}^2)$  (which is a closed subscheme of Hilbert scheme of  $|G|$ -points  $\text{Hilb}_{\{|G|\}}(\mathbb{C}^2)$ ). We use McKay correspondence by BKR to make a connection between stable pairs on the threefold  $G\text{-Hilb}(\mathbb{C}^2) \times \mathbb{P}^1$  and stable (ADE) quiver bundles on  $\mathbb{P}^1$ . This is a joint work with Bumsig Kim and Timothy Logvinenko.

**17:40**

**Dinner**