1067-20-994          **Matvei Libine\*** (`mlibine@indiana.edu`). *Split Quaternionic Analysis and Representation Theory.*

This is a joint work with Igor Frenkel.

I will describe our new developments of quaternionic analysis using representation theory of various real forms of the conformal group. We show that the counterparts of Cauchy and Poisson formulas solve the problem of separation of the discrete and continuous series for SL(2,R) and the imaginary Lobachevski space SL(2,C)/SL(2,R). We also obtain a surprising formula for the Plancherel measure on SL(2,R) in terms of the Poisson integral on the split quaternions.

Along the way we discover another connection between quaternionic analysis and mathematical physics. We show that the massless singular functions of four-dimensional quantum field theory are nothing but the kernels of projectors onto the discrete and continuous series on the imaginary Lobachevski space.

The talk is based on a recent paper "Split Quaternionic Analysis and Separation of the Series for SL(2,R) and SL(2,C)/SL(2,R)" (submitted). (Received September 17, 2010)