

# Tata Institute of Fundamental Research

## School of Mathematics

### Lecture Series on Local Langlands Conjecture

by

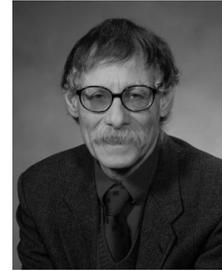
Professor Paul Baum

Venue: AG 69, Tata Institute of Fundamental Research

Dates: 25 February, 2013 to 27 February, 2013.

**About the Speaker:** Professor Paul Baum is the Evan Pugh Professor of Mathematics at Pennsylvania State University. He works in the field of non-commutative geometry. He is known for formulating the Baum-Connes conjecture with Professor Alain Connes in the early 1980s.

In 2007, a meeting in honor of his 70th birthday was held in Warsaw by the Polish Academy of Sciences. In 2011, the University of Colorado awarded him an honorary doctorate. In 2012 he became a fellow of the American Mathematical Society and in the same year, he was awarded an honorary doctorate by the Australian National University, Canberra.



#### Title and Abstracts of Talks:

Day/Date	Time	Title and abstracts
Monday 25/2/2013	11:30 am to 12:30 pm	<i>Geometric structure in the smooth dual of reductive <math>p</math>-adic groups</i> <b>Abstract:</b> Let $G$ be a reductive $p$ -adic group. Examples are $GL(n, F)$ $SL(n, F)$ where $n$ can be any positive integer and $F$ can be any finite extension of the field $\mathbb{Q}_p$ of $p$ -adic numbers. The smooth dual of $G$ is the set of equivalence classes of smooth irreducible representations of $G$ . The representations are on vector spaces over the complex numbers. In a canonical way, the smooth dual of any reductive $p$ -adic group $G$ is the disjoint union of subsets known as the Bernstein components. This lecture will state the ABPS (Aubert-Baum-Plymen-Solleveld) conjecture which asserts that each Bernstein component is a complex affine variety. These complex affine varieties are explicitly identified as certain extended quotients.
Tuesday 26/2/2013	2:00 pm to 3:00 pm	<i>Geometric structure and the local Langlands conjecture</i> <b>Abstract:</b> This lecture will consider the connection between the ABPS (Aubert-Baum-Plymen-Solleveld) conjecture and the LL (Local Langlands) conjecture. The proof will be outlined that (granted a mild restriction on the residual characteristic) LL is valid throughout the principal series of any connected reductive $p$ -adic group. The method of proof is to show that the geometric structure predicted by ABPS is present throughout the principal series and is also present in the enhanced Langlands parameters for the principal series.
Wednesday 27/2/2013	4:00 pm to 5:00 pm	<i>Morita equivalence revisited</i> <b>Abstract:</b> This lecture will define an equivalence relation on finite-type algebras which is a weakening of Morita equivalence. If two finite-type algebras are equivalent in the new equivalence relation, then they have isomorphic periodic cyclic homology and their primitive ideal spaces are in bijection. The new equivalence relation is used in the statement of the ABPS conjecture.