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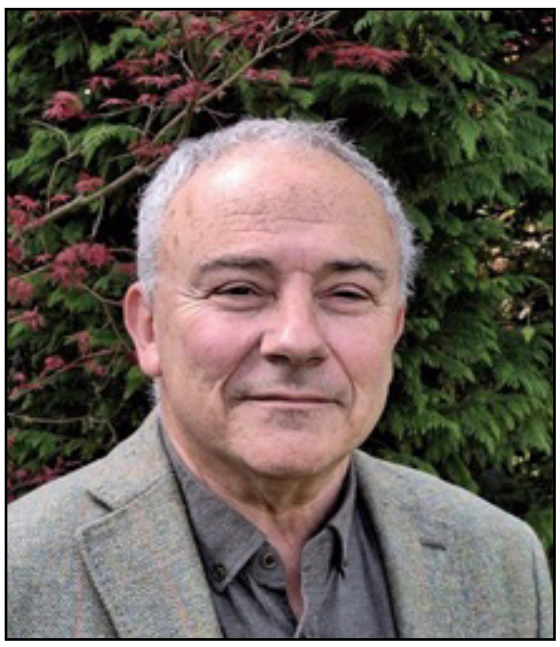
DISTINGUISHED LECTURE SERIES



Professor François Loeser
Mathematical Institute of Jussieu
Sorbonne University

François Loeser is a French mathematician. He is Professor of Mathematics at the Sorbonne University in Paris. Since 2015, he is a senior member of the Institut Universitaire de France.

He was awarded the CNRS Silver Medal in 2011 and the Charles-Louis de Saulces de Freycinet Prize of the French Academy of Sciences in 2007. He was awarded an ERC Advanced Investigator Grant in 2010 and has been a Plenary Speaker at the European Congress of Mathematics in Amsterdam in 2008. In 2014 Loeser was an Invited Speaker at the International Congress of Mathematicians in Seoul. In 2015 he was elected as a fellow of the American Mathematical Society "for contributions to algebraic and arithmetic geometry and to model theory". He was elected member of Academia Europaea in 2019.

LECTURE ONE: PSEUDO-FINITE FIELDS, MOTIVES AND INTEGRALS

Date : 18 Jun 2025
Time : 10am – 11am

Pseudo-finite fields were introduced by J. Ax as a first-order axiomatization of finite fi elds. To gether with J. Denef, we assigned to a definable set over a pseudo-finite field a g eometric object, called a virtual Chow motive, that encapsulates its number of points. This device can be used to construct a motivic measure for definable sets over n on-archimedean local fields for which a generalization of the classical Ax-Kochen Theorem holds. More generally, together with R. Cluckers we proved a general transfer principle allowing to transfer identities between functions defined by integrals over non-archimedean local fields of characteristic zero to local fields of positive characteristic and vice versa. As we proved together with R. Cluckers and T. Hales, this principle can be for instance applied to the Fundamental Lemma of Langlands-Shelstad, an identity between orbital integrals whose proof by Ngô achieved considerable fame. More recently we have been able with A. Forey and D. Wyss to use some of these methods to obtain a motivic enhancement of this identity.

LECTURE TWO: TAME GEOMETRY OVER VALUED FIELDS

Date : 25 Jun 2025
Time : 10am – 11am

We will provide a general overview of our work with E. Hrushovski on tame geometry over valued fields, using the stable completion of algebraic varieties over valued fields. A key result is the existence of retractions to piecewise-linear objects called skeleta, which are definably isomorphic to definable subsets of the value group. We will conclude by presenting a recent finiteness result obtained with A. Ducros, E. Hrushovski and J. Ye for tropical functions on such skeleta.

Venue : IMS Executive Seminar Room

Institute for Mathematical Sciences
Block S17, level 3
10 Lower Kent Ridge Road
Singapore 119076

Registration
https://tinyurl.com/Model-TheoryReg

These lectures are part of the program on
Recent Applications of Model Theory