SEMPARIS – Séminaires en région parisienne

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TBA

Mercredi 26 Fevrier 2020, 10 :30
IHES, Amphithéâtre Léon Motchane(Cours de l'IHES)
Domaines : hep-th

Titre : *Tame Geometry and Hodge Theory (2/4)*

Orateur : **Bruno Klingler (Humboldt Universität, Berlin)**

Résumé : *Hodge theory, as developed by Deligne and Griffiths, is the main tool for analyzing the geometry and arithmetic of complex algebraic varieties. It is an essential fact that at heart, Hodge theory is NOT algebraic. On the other hand, according to both the Hodge conjecture and the Grothendieck period conjecture, this transcendence is severely constrained.*

Tame geometry, whose idea was introduced by Grothendieck in the 80s, seems a natural setting for understanding these constraints. Tame geometry, developed by model theorists as o-minimal geometry, has for prototype real semi-algebraic geometry, but is much richer. It studies structures where every definable set has a finite geometric complexity.

The aim of this course is to present a number of recent applications of tame geometry to several problems related to Hodge theory and periods. After recalling basics on o-minimal structures and their tameness properties, I will discuss : - the use of tame geometry in proving algebraization results (Pila-Wilkie theorem ; o-minimal Chow and GAGA theorems in definable complex analytic geometry) ; - the tameness of period maps ; algebraicity of images of period maps ; - functional transcendence results : Ax-Schanuel conjecture from abelian varieties to Shimura varieties and variations of Hodge structures. Applications to atypical intersections (André-Oort conjecture and Zilber-Pink conjecture) ; - the geometry of Hodge loci and their closures.
