Program : ANR Cat-AG
5th to 7th December 2018

	Wednesday	Thursday	Friday
9h30-10h	Welcome		
10h-11h	Ludovic Monier	Alessandro Chiodo	Yizhen Zhao
11h-11h30	Coffee	Coffee	Coffee
11h30-12h30	Leyth Akrout Tabib	Jérémy Guéré	Etienne Mann
12h30-14h	lunch	lunch	lunch
14h-15h	Alexis Roquefeuil	David Kern	
15h -15h30	Coffee	Coffee	
15h30 -16h30	Tasos Moulinos	Sinan Yalin	
16h45 -17h15	Elena Dimitriadis	Hugo Pourcelot	
20h		Social dinner	

Alessandro Chiodo (Paris):
Title: Symétrie miroir les variétés de Calabi-Yau munie d'un automorphisme
Abstract: Il existe une version enrichie de la symétrie miroir qui s'applique aux surfaces K3, cas dans lequel l'énoncé ordinaire est trivial (cette version est due Borcea, Dolgachev, Nikulin et Voisin). Nous la traitons comme le point de départ d'un énoncé qui s'applique en dimension quelconque. Travaux en collaboration avec Kalashnikov et Veniani.

Elena Dimitriadis (Toulouse):
Title: TBA
Abstract:

Jérémy Guéré (Grenoble):
Title: TBA
Abstract:

David Kern (Angers):
Title: Espace des modules des quasi-maps
Abstract: Stable quasimaps generalise Gromov–Witten theory by allowing the stability condition to be parameterised by a rational line bundle on the target stack X. This has given rise to wall-crossing formulae between the virtual structure sheaves of different stability chambers. The virtual sheaf of a moduli stack should be interpreted as the classical shadow of the structure sheaf of a derived enhancement, and indeed Mann and Robalo showed that its role as integral kernel for the construction of Cohomological Field Theories by Gromov–Witen invariants could be made more functorial by considering instead an action in the ∞-bicategory of spans in derived stacks. Similarly, in quasimap theory, any choice of stability parameter will endow the loop stack $\mathcal{L}X$ with a structure of lax algebra over the moduli spaces of curves $\overline{\mathcal{M}_{0,n}}$. We will explain how the wall-crossing phenomena can be interpreted as an action of a categorified Givental group on the space of $(\overline{\mathcal{M}_{0,\bullet}})$-algebra structures."

Etienne Mann (Angers):
Title: Derived algebraic geometry and Spin curves
Abstract: We will explain how to put a derived structure on the moduli space of stable maps

and how one can do a similar thing for spin curves.

Tasos Moulinos (Toulouse):
Title: On the topological K-theory of dg categories of twisted sheaves on schemes and Deligne Mumford stacks.
Abstract:

Ludovic Monier (Paris):
Title: Deformation and quantization in derived geometry
Abstract: Deformation and quantization in derived geometry Calaque, Pantev, Ton, Vaquié and Vezzosi developped a theory of differential calculus in derived geometry. I will present their work and its motivation from classical algebraic geometry and manifold theory. The central notion is the definition of shifted Poisson structures allowing deformations of a derived Artin stack, generalizing usual Poisson structures used for quantization in quantum mechanics

Hugo Poucelot (Paris):
Title:TBA
Abstract:

Alexis Roquefeuil (Angers):
Title: K-theoretic Gromov–Witten invariants and q-difference equations
Abstract: Gromov–Witten invariants are rational numbers that count the number of curves in an ambient variety that meet some prescribed loci. These invariants can be packaged as cohomological classes on the moduli space of stable maps. In the genus 0 case, one way to produce computations of such invariants is to use a Mirror Symmetry correspondence between two differential modules. More recently, Givental and Lee have defined a K-theoretic analogue of Gromov–Witten invariants as the Euler characteristics of some sheaves on the same moduli space. We obtain new integer invariants that satisfy weaker properties compared to Gromov–Witten invariants; in particular, the D-module structure we had in the cohomological case is incomplete. Later works of Givental, Iritani, Milanov and Tonita suggest that the K-theoretic Gromov–Witten invariants should be instead encoded in a differential-difference module. In this talk, when the ambient variety is a projective space, we will try to shed some light on these q-difference equations and explain how they are related to the quantum D-module of Gromov–Witten invariants.

Leyth Akrout Tabib (Toulouse):
Title: Espace des lacets libres et variété des caractères.
Abstract:

Sinan Yalin (Angers):
Title: Derived deformation quantization via higher Hochschild cohomology
Abstract:I will present a work in collaboration with Gregory Ginot which solves and generalize at once a host of longstanding conjectures in deformation theory and deformation quantization, by setting them in an appropriate new framework. I will first introduce this framework to parametrize the homotopy theory of a large class of algebraic structures, as well as the derived formal moduli problems controlling their deformation theory. Relying on this solid basis, I will explain why the deformation theory of dg bialgebras is controled by the higher Hochschild complex of algebras over the little 2-disks operad (an E2 operad).

By the higher Deligne conjecture (now a theorem), this higher Hochschild complex inherits a structure of algebra over the little 3-disks operad (an E3 operad), and it turns out that this structure controls the deformations of bialgebra structures, hence solving a longstanding conjecture of Gerstenhaber-Schack (1990). This result is used, in turn, to prove an E3-formality theorem for the deformation complex of the symmetric dg bialgebra conjectured by Kontsevich in his work on deformation quantization of Poisson manifolds (2000). As a consequence, following a path similar to Kontsevich-Tamarkin's proof of deformation quantization of Poisson manifolds, this gives a new proof of the celebrated universal deformation quantization of Lie bialgebras (hence of Poisson-Lie groups) which works actually in the much more general setting of homotopy dg Lie bialgebras. If time permits, we will say a few words about continuations of this work in the realm of Poisson-Lie algebroids and its relationship with quantization in derived symplectic geometry.

ZHAO Yizhen (Paris):
Title:TBA
Abstract: