



Du  
**03**  
MARS.  
2021

13h00  
-  
14h00

## **RÉGA**

### **Tony Yue Yu - 14h00 - Frobenius structure conjecture and application to cluster algebras.**

Zoom

<https://zoom.us/j/97172991924?pwd=bVZkRmJKdENUQk4xVGh0VkIBRIFvdz09>

I will explain the Frobenius structure conjecture of Gross-Hacking-Keel in mirror symmetry, and an application towards cluster algebras. Let  $U$  be an affine log Calabi-Yau variety containing an open algebraic torus. We show that the naive counts of rational curves in  $U$  uniquely determine a commutative associative algebra equipped with a compatible multilinear form. Although the statement of the theorem involves only elementary algebraic geometry, the proof employs Berkovich non-archimedean analytic methods. We construct the structure constants of the algebra via counting non-archimedean analytic disks in the analytification of  $U$ . I will explain various properties of the counting, notably deformation invariance, symmetry, gluing formula and convexity. In the special case when  $U$  is a Fock-Goncharov skew-symmetric  $X$ -cluster variety, our algebra generalizes, and gives a direct geometric construction of, the mirror algebra of Gross-Hacking-Keel-Kontsevich. The comparison is proved via a canonical scattering diagram defined by counting infinitesimal non-archimedean analytic cylinders, without using the Kontsevich-Soibelman algorithm. Several combinatorial conjectures of GHKK, as well as the positivity in the Laurent phenomenon, follow readily from the geometric description. This is joint work with S. Keel, arXiv:1908.09861. If time permits, I will mention another application towards the moduli space of KSBA (Kollár-Shepherd-Barron-Alexeev) stable pairs, joint with P. Hacking and S. Keel, arXiv: 2008.02299.

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**HORAIRES**

Lundi au vendredi : 8h30 à 18h  
Fermé les jours fériés