**Institut Henri Poincaré**

11 rue Pierre et Marie Curie, 75231 Paris cedex 05

**String Theory in Greater Paris**

**Rencontres Théoriciennes**

**"Supergravité, théorie des cordes et théorie M"**

***Jeudi 30 Novembre 2023, 10:00***

# Ruth Shir

***University of Luxembourg***

## A gravitational manifestation of Krylov complexity

*Within the framework of the AdS/CFT correspondence, the time dynamics of black holes in the bulk hints to the existence of boundary observables that evolve for very long time-scales. The search for such boundary observables yielded several notions of quantum complexity, though a precise and direct bulk-boundary correspondence was lacking. In this talk we focus on a particular notion of quantum complexity, known as Krylov complexity. We will provide a pedagogical overview, including some interesting results, for this boundary observable, and show how to work with it in the case of double-scaled SYK. Finally, we will show that in the limit where double-scaled SYK is dual to JT gravity, Krylov complexity evolving in time on the boundary has a precise gravitational description in the bulk.*

**Institut Henri Poincaré, salle 314, 3ème étage**

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