

## Theory Lunch Seminar

# *Glass transition: where do we stand?*

The glass transition is a long-standing problem of condensed matter. When a liquid is cooled down sufficiently rapidly to avoid crystallization, its dynamics slows down very rapidly until a glass is formed, whose properties differ qualitatively from crystalline materials. The origin for both the sudden dynamical slowing down and the anomalous properties of the glassy solid phase are debated. These questions are related to how a physical system can explore a complex, rugged free energy landscape with many metastable states. Arguably the most popular theory for these phenomena is that the glass transition is controlled by a thermodynamic transition leading to a growing "hidden" order whose characteristic length scale diverges at some finite temperature. Here we argue, based on the recent finding that certain Monte-Carlo algorithms can essentially get rid of the dynamical slowing down near the glass transition, that these theories do not apply, and discuss alternative views.



**Matthieu Wyart**

Physics of Complex Systems Laboratory  
<http://pcsl.epfl.ch/Wyart>

**Friday September 22<sup>nd</sup> 2017 at 12:45pm**

**Auditoire II, room N°234, BSP (Cubotron), EPFL**