## 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 14 Mars 2019, 10:00***

# Jelle Hartong

***Edinburgh U.***

## Non-relativistic Gravity

*In this talk I will discuss the expansion of general relativity in inverse powers of the speed of light. This expansion can be truncated at any desired order and, when truncated at the next- to-leading order, it can be used to derive an action principle for a diffeomorphism invariant description of non-relativistic gravity. This describes Newtonian gravity as well as strong gravity extensions thereof (e.g. due to time dilation effects). I will show how to couple such a theory to matter (point particles, scalar fields and fluids) and use this to show that the Tolman-Oppenheimer-Volkov star solution and the Friedmann equations can both be viewed as solutions to the equations of motion of matter coupled non-relativistic gravity. By looking at geodesics in a spherically symmetric background one can show that the phenomenon of perihelion precession is also described by this theory. Time permitting I will end with some comments about string and holographic extensions of these results.*

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

Retrouvez les activités de la communauté parisienne de théorie des cordes sur
`http ://string.lpthe.jussieu.fr`
La liste de tous les séminaires en région parisienne est disponible sur
`http ://string.lpthe.jussieu.fr/semparis`