



RTG Models of Gravity – Online Colloquium

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| Date: | 16 December 2020 |
| Time: | 14:00 - 16:30 CET |
| Location: | Copenhagen/Online ZOOM link https://ucph-ku.zoom.us/j/69640967149 Meeting-ID: 696 4096 7149 |

Program

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| 14:00 – 15:00 | <p>Michèle Levi (NBIA, NBI Copenhagen) <i>QFT for Gravity at All Scales</i> We will review the state of the art in PN gravity, and in particular its significant advancement via the effective field theory (EFT) of spinning gravitating objects. First, we will introduce the concept of a tower of EFTs for the binary inspiral problem. We will then show the intricate formulation of the EFT of spinning objects. Finally, we will present some advanced recent results accomplished within this framework.</p> |
| 15:00 – 15:30 | <i>Coffee Break</i> |
| 15:30 – 16:30 | <p>Jelle Hartong (University of Edinburgh) <i>On the Non-Relativistic Expansion of General Relativity and Quantum Mechanics</i> Recently progress has been made on how to systematically expand general relativity in powers of $1/c$ where c is the speed of light. This expansion is similar in spirit to the post-Newtonian expansion, but it has the benefit that it can be applied to any matter system that is coupled to GR. Furthermore, the expansion is covariant and can be applied off shell so that we can use it to define action principles for non-relativistic gravity plus relativistic corrections. I will review these developments. The second part of the talk will be about the question: how to describe the interactions between gravity and matter at the quantum level in the non-relativistic domain? For example, if we treat gravity as a classical background that is $1/c$ expanded, how do we couple it to a quantum system? Even in this non-relativistic domain a theory of quantum mechanics backreacting on non-relativistic gravity is non-trivial. Time permitting, we will discuss approaches, such as non-relativistic string theory that can potentially address such and other issues.</p> |