Below is the abstract of the next seminar that will be given by Frank Kruger (London Centre for Nanotechnology, University College London, UK https://www.ucl.ac.uk/~ucanfkr/) that will be held at the Laboratoire Léon Brillouin, bat.563 in CEA Saclay, in **room 15 the 19th September 2024 at 11 a.m.**

Nature of Topological Phase Transition of Kitaev Quantum Spin Liquids

Abstract:

We investigate the nature of the topological quantum phase transition between the gapless and gapped Kitaev quantum spin liquid phases away from the exactly solvable point. The transition is driven by anisotropy of the Kitaev couplings. At the critical point the two Dirac points of the gapless Majorana modes merge, resulting in the formation of a semi-Dirac point with quadratic and linear band touching directions. We derive an effective Gross-Neveu-Yukawa type field theory that describes the topological phase transition in the presence of additional magnetic interactions. We obtain the infrared scaling form of the propagator of the dynamical Ising order parameter field and perform a renormalization-group analysis. The universality of the transition is found to be different to that of symmetry-breaking phase transitions of semi-Dirac electrons. However, as in the electronic case, the Majorana fermions acquire an anomalous dimension, indicative of the breakdown of the fractionalized quasiparticle description.

(If you do not have an access to the CEA Saclay center, you need to ask for an access to aurore.verdier@cea.fr)