CRC 1227
Designed Quantum States of Matter

# GUEST LECTURE


## Dr. Pierre Cladé

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Leibniz Universität Hannover

**DQ-mat Colloquium**

**Thursday, 17 October 2024, 4.00 pm**

**Room D326, Welfengarten 1, building 1101**

## "Measurement of recoil velocity by atom interferometry and realization of an interferometer using a frequency comb"


For 20 years, our team in Paris has been using an atom interferometer to precisely measure the recoil velocity of an atom absorbing a photon. This measurement makes it possible to obtain the ratio h/m between Planck's constant and the mass of the atom used, a ratio from which it is possible to obtain a determination of the fine structure constant α. I will present the principle of this experiment as well as the main systematic effects and the techniques used to control them.

Secondly, I will present a new type of interferometer in which a frequency comb is used directly to interact with the atoms. Thanks to a delay line, it is possible to precisely control the position of the atomic beam splitter. This technique allows us, for example, to interact with each arm of the interferometer separately.


**All DQ-mat members and all interested are cordially invited to attend.**