

PhD position

The EPFL [Laboratory of Particle Accelerator Physics \(LPAP\)](#) is looking for a motivated PhD student to contribute to the conceptual design study of a future muon collider.

High energy colliders are an essential tool for the study of elementary particles. As the standard model of particle physics is not complete, the study of particles with masses higher than those within the LHC's reach is highly desirable. Colliding muons has several advantages over hadrons or electron and positrons when considering energies in the TeV range, notably in terms of energy efficiency. However as the muons are not available in matter, they need to be generated via the collision of a primary beam of protons, resulting in muon beams with a large beam size. As large beam sizes are not compatible with the high collision rate desired to study the physics of elementary particles, a process called ionisation cooling is needed in order to reduce the size of the muon beams. During this process, the high energy muons lose a fraction of their energy to blocks of matter via multiple ionisations. Existing models for this critical step of a muon collider only describe the trajectories of individual muons. The collective interactions of a beam composed of several muons is unexplored. The student will study such collective interactions of the muons during ionisation cooling and understand the resulting performance limitations linked to the generation of beam instabilities.

More details about the collaboration can be found at : [Muon Collider Study](#)

The position becomes available **on February 1, 2023**, with a possibility to start later if needed. A Master's degree (or equivalent) should be held by the start of employment. The ideal candidate has a strong motivation for fundamental research, and has received education in Physics and/or engineering. Experience with data analysis, computer programming and/or particle accelerators is an advantage. An attractive salary is offered [details are available at the following links [2](#), [3](#), [4](#)], and the appointment runs for up to four years. EPFL, as well as CERN, offer a stimulating multicultural working environment at the forefront of fundamental research.

Applicants should prepare **a single PDF** file including the following documents: motivation letter, CV, and contact information of at least two referees willing to write a reference letter, and send it to our secretariat (Mrs. Hofmann, recruiting.lpap@epfl.ch) **by November 30th, 2022**. Applicants should ask the referees to send their letters to the same address by the same deadline. More information can be obtained from Prof. M. Seidel (Mike.Seidel@epfl.ch) and Dr. T. Pieloni (Tatiana.Pieloni@epfl.ch).

The Application and the Letters of Reference should be sent to: recruiting.lpap@epfl.ch