High resolution measurements of isotopes in Greenland ice cores using lasers
Master Thesis Project

Are you looking for an exciting master thesis project that includes state of the art research and development focused on ice cores?

If you are a creative person that likes to think out of the box and dares to take the challenge of creating high tech measurement methods that have not been attempted before then please do contact us!

We are looking for a skilled and highly motivated student to join our team in the Stable Isotope laboratory of the Physics of Ice, Climate and Earth group at the Niels Bohr Institute. The project’s goal is to achieve very high resolution measurements of stable water isotope ratios in polar ice cores from Greenland and Antarctica. Such samples from Greenland provide us with information about the state of the climate system back in time reaching as far back as 120,000 y.

We want to build a novel measurement technique using a unique combination of ultrashort pulse laser sources and Cavity Ring Down Spectroscopy. This has not been attempted before and as a result the territory is completely unexplored.

You will be working with the design, manufacturing, prototyping and testing of new parts using CNC and 3d printing. You will also deal with the design and assembling of a precise positioning system for the new method and get hands on experience in attaching the developed system to a Cavity Ring Down Spectroscopy instrument.

Prior knowledge about ice cores or Laser Spectroscopy is not mandatory though experience with programming and in particular Python and/or Arduinos will be considered a plus.

You will be a part of an international and multidisciplinary group at the Niels Bohr Institute. Our group has decades of experience in drilling, analysis and interpretation of polar ice cores with an internationally leading position in the paleoclimate community.

The project is a collaboration with prof. Carlo Barbante at the Department of Environmental Science at the University of Venice in Italy and senior researcher Yang Zhang at the Department of Mechanical Engineering at DTU.

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