

# **X-ray Micro Computed Tomography (micro-CT)**

## PhD course (5 credits)

### **Aim of course:**

The aim of this course is to give an introduction to micro-CT as a tool to analyse the 3D structure of different types of samples. The course will provide the attendees with a working knowledge of micro-CT and will emphasise practical examples.

### **Course content:**

An introduction will be given to the physics behind this imaging technique and to the mathematics of tomographic reconstruction. Examples taken from diverse scientific and engineering fields will be used to illustrate data analysis and visualization strategies. Different scan settings will be discussed, i.e. the impact of changes in parameters such as voltage, filter, and rotation. Furthermore, the reconstruct projection process will be introduced and how to deal with artefacts such as beam hardening and ring artefacts will be discussed. Examples, coming from both biology as well as material science, will be used to discuss and practise the analysis of parameters such as density, porosity and structural thickness.

### **Examination:**

An individual project, including scanning, reconstruction, analysis and 3D visualisation of a sample of choice.

### **Teacher:**

Caroline Öhman Mägi

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### **To participate:**

Apply by sending an email to Caroline Öhman Mägi. The course has a maximum number of 15 participants.

## **Course schedule**

Lecture 1 – Introduction and fundamentals of micro-CT imaging.

Lecture 2 – The different parts of the micro-CT and the acquisition of images.

Lecture 3 – Reconstruction from projections.

Lecture 4 – Visualisation and co-registration.

Lecture 5 – Analysis of images.

Practical exercise.

Lecture 6 – Recent research in micro-CT imaging.

Lecture 7 – Tips and tricks to make the most out of your scan.