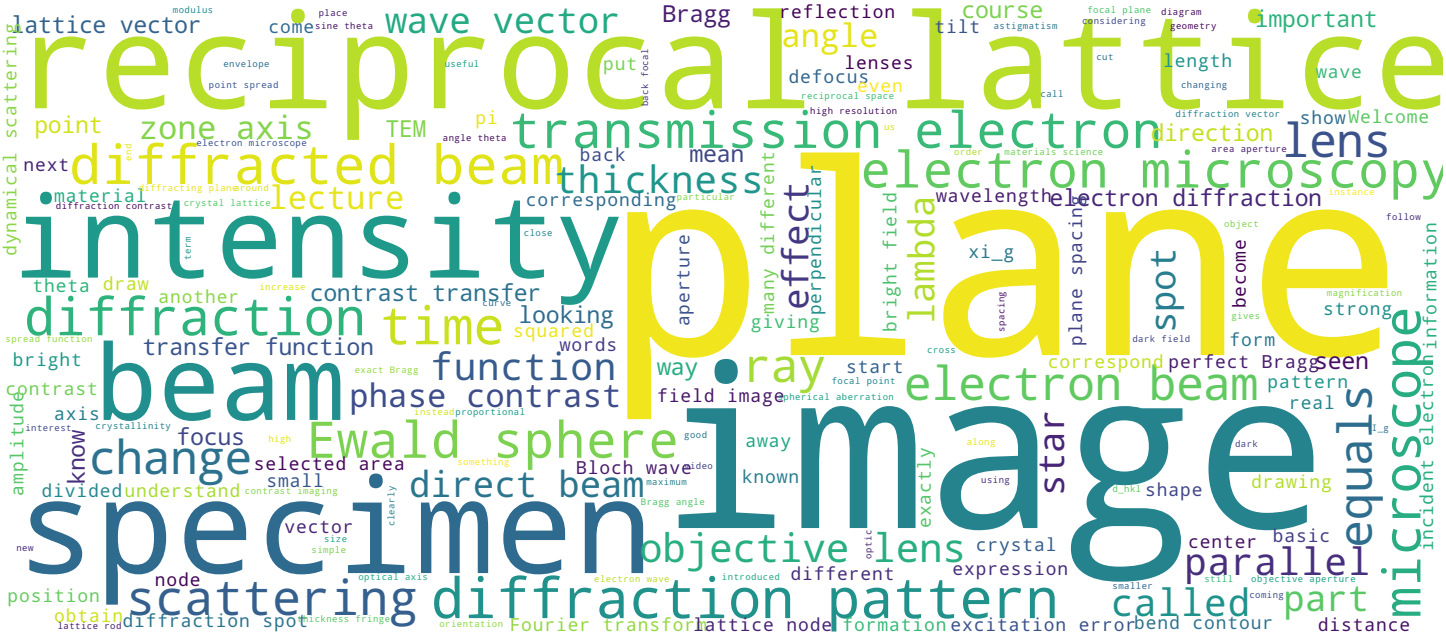
Introduction Video



Search MOOC

Video

EPFL

Introduction Video

I'm Cécile Hébert professor in physics at EPFL and leading the center for electron microscopy here. And I'm Duncan Alexander, a scientific professional at EPFL specialized in transmission electron microscopy and welcome to CIME's course on transmission electron microscopy for materials science. Since its invention, transmission electron microscopy has become a key tool in analysis of many types of materials. It has the ability to generate an image with nanometric or even atomic resolution and can give, for example information on the crystallinity of materials, but also on the defect structure the characteristics of interfaces and grain boundaries, etc. Nowadays, state of the art transmission electron microscopy is both a mainstay of much advanced materials and technological research, but also for industries, such as semi-conductor fabrication or catalyst production. When using this microscopy, often called "T - E - M", or “TEM” for short, the electron beam of the microscope has strong interactions with the sample of interest. We use these different interactions to characterize and to understand many different properties of this sample.

Notes

Summary

0m 00s

Introduction Video

To take such useful data, or to interpret TEM results, it is important to have a thorough understanding of the basics of TEM. Starting from the microscope and its optics through electron matter interactions, and on to how we use these to record imaging data. Teaching these basics is the aim of this course. Starting with an introduction to TEM, on through electron diffraction and diffraction contrast imaging, and finally to phase contrast imaging used for high-resolution TEM. This course is clearly designed for people working with solid specimens, I mean non-biological specimens, where the crystallinity will dominate the contrast. So, if you are to take a practical training on a TEM, this course provides a first theoretical grounding for your training. However, it will also be useful to understand any TEM image you might encounter, or it can provide the basic building blocks you need before studying or applying one of the many more advanced TEM-based techniques. And as TEM is an imaging technique, and operating the instrument a dynamic process, in our course we embedded many examples filmed on real TEM, making it more visual than a book. We hope you enjoy it. In the coming weeks you will see both of us for different modules in the course. Now for the introduction, Cécile will begin, so over to you Cécile. Thank you Duncan!

Notes

Summary

2m 47s