

Friday March 22nd 2019 - 10h 00

Amphitheater of C2N

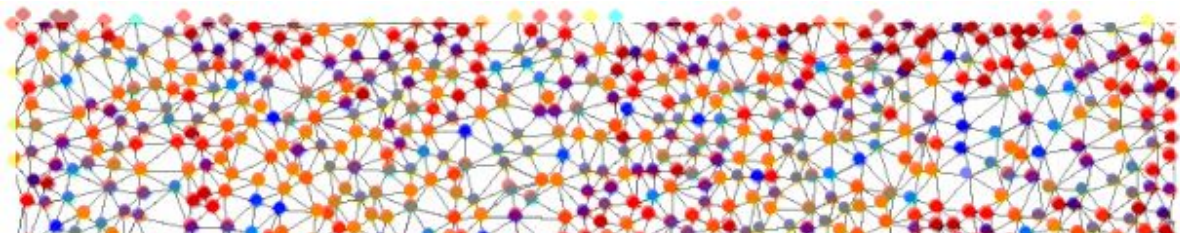
Some current trends in the physics of superconducting flux vortices

Kees van der Beek

(Department of Materials – C2N)

Owing to the prospect of spectacular dissipation-less applications such as powerful magnets and exquisitely sensitive detectors with an ever-smaller need for refrigeration of the material, the discovery of new classes of high temperature superconducting materials is usually accompanied by much excitement. However, fashioning actual superconducting applications meets with different limitations of fundamental, material, and technological nature. At the same time, type II superconductors, in which the magnetic field partially permeates the material in the form of quantized flux lines (or vortices), provide an exciting playground for the study of different flux-line aggregation states.

In this presentation, I shall briefly dwell on the state of the art in the field of superconductivity, before describing some examples of recent research on vortex physics: the interaction of vortex lines with disorder and the occurrence of different vortex states in the iron-based high temperature superconductors, and the physics and application of cuprate high temperature superconducting films for RF and HF current limiting devices. I shall finish with a number of perspectives.



Color-coded map of the modulus of the individual vortex pinning force per unit length, calculated from a Bitter decoration image on a Ba(Fe_{0.9}Co_{0.1})₂As₂ single crystals



Kees van der Beek obtained his PhD from Leiden University in the Netherlands in 1992. He worked as a post-doc at the Materials Science Division of Argonne National Laboratory, and at the Ecole Polytechnique Fédérale de Lausanne in Switzerland, and joined CNRS and the Laboratoire des Solides Irradiés (LSI) of Ecole polytechnique in early 1997. From 2014 to 2017, Kees was director of the LSI. Since 2016, he is chair of the “Physics of Light and Matter” (PhOM) Department of Paris-Saclay University. From 2009 to 2013, he chaired the Condensed Matter Division of the French Physical Society SFP; in 2015, he becomes chair of the Condensed Matter Division of the European Physical Society (EPS). In January 2019 he joined the research group EPLA at C2N

External visitors should be register beforehand in the following [link](#)

