

# MPTL-11 Workshop

## Modelling in the context of the SUPERCOMET 2 Project

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## Abstract - 1

During the EU project Superconductivity Multimedia Educational Tool, phase 2 (SUPERCOMET 2), materials developed in the previous SUPERCOMET project have been tried out by partners since 2005. A teacher seminar presents hands-on activities in combination with interactive animations, text and video presenting electromagnetism and superconductivity with an accompanying teacher guide. The materials are translated/adapted and tried out at schools in 15 European countries.

## Abstract - 2

The project aims to develop new electronic learning modules connected to superconducting materials and applications of superconductivity during 2006 and 2007.

The project also aims to develop a kit of materials for the hands-on demonstrations and experiments with high-temperature superconductors requiring cooling with liquid nitrogen that can be carried out by pupils and teachers in upper secondary school.

## Abstract - 3

After a brief introduction of the project's current status and a presentation of activities by different partners, the presentation will discuss different approaches to modelling in the context of the project materials, based on the recent workshop during GIREP 2006 in Amsterdam and subsequent project meetings and contributions.

# Project status

<b>Teacher seminar</b>	Translated & tried out in most countries.
<b>Computer application</b>	Translated & tried out in most countries. New modules under development.
<b>Hands-on kit hi-tech</b>	Making, testing and measuring superconductors. Prototype ready soon.
<b>Hands-on kit low-tech</b>	Draft list of contents discussed. Upcoming workshop for prototyping.
<b>Teacher guide</b>	Translated/adapted by some partners. Will be updated in coming months.
<b>Classroom posters</b>	Not written yet, based on modules.
<b>Intranet</b>	In use by partners.
<b>Extranet</b>	Recently implemented new version.
<b>Online community</b>	Implemented, but not used much yet.

# Partner activities

## Computer application

Modules “Applications of superconductivity” and “Superconducting materials” written by University of Ludwigsburg, Simplicatus and University of Rouse

Modules “Introduction to superconductivity” and “Explanation of superconductivity” written by Simplicatus with Universities of Munich, Ludwigsburg and Graz

## Hands-on kit low-tech

Workgroup headed by PAP  
Workshop 12-13 October in Udine

## Hands-on kit hi-tech

Workgroup headed by Loughborough Univ.  
Workshop in Antwerp, Nov 2006

## Teacher seminar

Workgroup headed by University of Antwerp  
Workshop in Loughborough, February 2007

## Teacher guide

Workshop in Graz, March 2007

## Modelling / simulations

Workshop in Murcia, April 2007

## Mental models of physical phenomena

The project presents different mental models for understanding electromagnetic phenomena, e.g. the particle model and the electron drift model.

The Bohr model has been chosen for a simple graphical representation of metal atoms and ions in the lattice when illustrating electric conduction.

Research on the use of such mental models in learning has been done by the universities of Udine, Rouse and Ostrava.

# Numerical modelling with spreadsheet

One useful tool for exploration of numerical modelling as a part of the learning process is the spreadsheet, and the project will provide examples of this in the teacher guide, developed by the New University of Lisbon.



## Simulations based on numerical models

Most of the animations previously developed by the project are not based on numerical models, but qualitative representations of mental models.

A sample Easy Java Simulation will be made by the University of Murcia, and project partners will discuss how to extend this work with further funding in a future project.

# References

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## Project participants at MPTL-11

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