



Institut de Minéralogie et de Physique des Milieux Condensés
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SÉMINAIRE

Lundi 5 mars, 10h30

*Salle de Conférence, 4ème étage, Tour 22-23, Salle 1
IMPMC, Université P. et M. Curie, 4, Place Jussieu, 75005 Paris*

QIANG XU

Delft University of Technology, Delft. The Netherlands

ELECTRON MICROSCOPY ON CHARACTERIZATION OF SUPERCONDUCTING MATERIALS

By means of high resolution transmission electron microscopy, quantitative nano-electron diffraction and quantum chemistry calculations, we demonstrate the possibility of *ab initio* structure determination of novel phases, such as complex transition metal borates (e.g. $\text{Mg}_{10}\text{Ir}_{19}\text{B}_{16}$) and oxides (e.g. $\text{Eu}_2\text{CaCu}_2\text{O}_2$). We show that the structure of these new phases can be determined with high precision, comparable to single crystal X-ray or neutron diffraction methods, even if light atoms are present, e.g. B and O. We also show that the temperature dependence of these new structures can be studied in combination with *in situ* electrical transport property measurements within the transmission electron microscope in a wide range of temperature 80-1000 K. Finally, a theoretical discussion will be given as to the possibility of direct imaging valence electron distribution using high resolution electron microscopy.

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