



Postdoctoral position at the Laboratoire Léon Brillouin (LLB)

Small Angle Neutrons Scattering study of nanometer-sized precipitations in steels.

In response to the industrial needs, steels with very high mechanical characteristics are under development. In particular, the principle of reinforcement by a double precipitation of nanometric carbides and intermetallic phase attracts interest. The mechanical properties depend strongly of nanometer-sized precipitates, of their number density, their size, their coherence with the matrix. The control of this double precipitation requires a very fine characterization of the particles, especially at the first stages of their formation. Thus, Small Angle Neutron Scattering (SANS) is a key tool in material study at nanoscale. This method allows characterization, in a non-destructive way, of small particles (precipitates, pores, cavities, mesoporous structure...) ranging in size between 1 and 100 nm by benefiting from advantageous contrasts as well as magnetic scattering.

The proposed work includes the characterization by SANS of different steels containing carbides or intermetallic particles at various stages of thermal treatment. The successful candidate will perform the SANS measurements and the experimental data analysis. This study will be undertaken in collaboration with an industrial partner and 4 others French laboratories which present complementary analyses techniques as Atom Probe Tomography and TEM. The objective of this study, developed within the framework of an ANR project (Agence Nationale de la Recherche), is to describe the precipitation kinetics of the two phases, isolated or in competition, and to correlate the microstructure to the mechanical properties of the steels.

LLB (UMR12 CNRS/CEA) is the French national laboratory of neutron scattering. It is located at Saclay, in the south of Paris in an extremely rich scientific environment (CEA, Synchrotron SOLEIL, and Université Paris Sud). In addition to a great quality own scientific research, the LLB accommodates each year more than 500 visiting researchers who come to carry out neutron scattering experiments covering a large spectrum of scientific fields (Physics, Chemistry, soft Matter, Materials, Biology). http://www-llb.cea.fr/index_e.html.

The candidate must have a PhD, a formation in material science and some experience in diffraction (X-rays, neutrons or electrons). Abilities in data treatment and programming will be appreciated.

The appointment will initially be for one year, with the possibility of extension for up to one additional year. **Starting date: September - October 2007**

Applicants should send a letter of application, a detailed CV, two academic references and a list of publications to Dr. Marie-Hélène MATHON, responsible of the Materials group mhmathon@cea.fr or Susana GOTA, Deputy Director of LLB. susana.gota-goldmann@cea.fr

Present your candidatures now