

Short description written by each ESR and ER

Project acronym: MULTIMAT

Project ID (6 digits): 505226

Project Participant: Department of structure and constituents of matter, University of Barcelona, Spain

You			Your stay in the network				
NAME, first name	Nationality	Previous place of work/education	Start date	Duration (months)	Category ESR/SR	Place	Country
BONNOT, Erell	French	INSA of Lyon, France	01/10/2004	36	ESR	Barcelona (University of Barcelona)	Spain

I studied in the National Institute of Applied Sciences (INSA) in Lyon (France) where I obtained a degree of engineer in material sciences. My end of studies project, of six months, was about the mechanical behaviour of dual phase steels and in particular the microplastic behaviour and its modelization, and the relation between microstructure and properties. I also worked six months in Saint-Gobain CREE in Cavaillon (France) as a trainee and studied the kinetics of hot pressing and the microstructural, mechanical, and tribological characterization of quasicrystals. During the two first years of my PhD, I have followed the classes of the master in applied physics and in particular a course about *Elasticity and phase transitions* given by Pr. Turab Lookman from the Theoretical Division of Los Alamos National Laboratory. At the end of this master, I presented my work entitled *Learning through cycling in martensitic phase transitions* and obtained the degree of Advanced Studies in applied sciences with maximum qualification.

This project gave me the opportunity to interact with others ESR from the Institute of Physics of Prague, the University of Oxford, collaboration with the Cambridge team, and also to stay one month in the Institute of Physics of Prague to see the laboratories and to achieve new experiments. With the support of the project, I could attend all the meetings of Multimat, the international conference ESOMAT, and also a course entitled *Multiscale modelling of plasticity and fracture by means of dislocation mechanics* in the CISM in Udine (Italy).

In the frame of this project, different works have been achieved and others are in progress. Continued work has been performed on acoustic emission during martensitic transitions in Cu-based shape-memory alloys and the results obtained from the evolution with cycling (temperature and strain induced) across the transition of the correlation function between acoustic activity (partially in collaboration with Prague team) presented in the Esomat conference. Preliminary experiments have been realized, in collaboration with Cambridge team, on acoustic emission in Ca doped and undoped KMnF_3 systems near its tricritical point. Finally, a non conventional experimental set-up has been developed to enable a fine control of the applied stress while the deformation is continuously monitored with an optical system which permits in-situ observation of the transition process.