



SEMINAR

"Atomic scale characterization of segregations and phase transformations in (severely) deformed alloys using atom probe and high resolution transmission electron microscopy"

Thursday 8 November, 2012

11am – 12noon

Lecture Theatre S10, Building 25, Clayton Campus

Dr Xavier Sauvage

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Ultrafine grain structures of materials processed by severe plastic deformation methods have been widely investigated during the past 15 years. Beside grain refinement and the resulting higher yield stress, it is now well established that the atomic mobility might be dramatically increased during severe plastic deformation. This feature could give rise to specific phenomenon like precipitate dissolution, formation of supersaturated solid solution or grain boundary segregations. Both the underlying physical mechanisms of deformation induced atomic transport and the influence on the grain size refinement mechanisms and on the final properties (especially strength, and thermal stability) are not fully understood yet. This presentation reports about recent experimental data collected by atom probe tomography and high resolution transmission electron microscopy on grain boundary segregation of solute elements in an Al-Mg and an Al-Zn alloy. Then, the second part of this talk will be devoted to phase transformations in severely deformed structures with a special emphasis on precipitation hardening in the Cu-Cr system. It will be shown how the competition between recrystallisation and phase transformation may result in specific microstructures and properties.

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