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# SEMINAIRE



**Service de Recherches de Métallurgie Physique**  
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***Forced atomic mixing and self-organization in metals during ion irradiation or severe plastic deformation***

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A material subjected to sustained driving forces constitutes a dissipative system since it receives a continuous energy flux from its environment, energy which is partly converted into heat, but also partly into shifting atomic locations and creating defects. In such dissipative systems, a delicate balance is established between the dynamics imposed by the external forcing, and the internal dynamics of the system, and this balance controls the structural evolution of the material. By varying relevant forcing parameters, for example ion flux during irradiation, or shearing rate during severe plastic deformation (SPD), one can alter this balance and thereby induce dynamical transitions from one steady state to another with remarkable control. At the University of Illinois we have been exploring self organization in metals during either irradiation or SPD and find that under certain conditions some metals form patterns with a fixed nanometer length scale. In this seminar, emphasis is focused on the relocation of atoms during forced mixing and the role of the heat of mixing of the alloy. Examples are drawn from ion sputtering and compositional patterning during ion irradiation or SPD.

**Mercredi 22 octobre 2008 à 10h30**

***N.B :*** ***Les visiteurs de nationalité étrangère hors Union Européenne sont priés de bien vouloir avertir impérativement 3 semaines à l'avance – les visiteurs de l'Union Européenne 1 ou 2 jours avant le séminaire – le Secrétariat du Service de leur entrée sur le Centre :***  
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