

## **Mechanical Engineering Department Seminar**

### **Microstructure Evolution in Advanced Alloys under Irradiation**

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Material properties are governed by the microstructure. Because, microstructure changes under irradiation, it is fundamental to understand mechanistically microstructure evolution under irradiation and its impact the macroscopic properties to be able to predict the material under nuclear reactor operating conditions. This is all the more critical for alloys envisioned for cladding and structural applications in advanced reactors which are proposed to operate at high temperature and high irradiation doses (up to 200 dpa). To that end, the use of charged-particle irradiation coupled with materials characterization techniques such as in-situ transmission electron microscopy can be a useful tool for studying irradiation-induced processes because it allows for high dose rates and control over the irradiation parameters. This talk will present examples of such studies of irradiation-induced microstructural evolution in advanced materials, such as irradiation-induced grain-growth in nanocrystalline metals, phase stability in oxidedispersion strengthened (ODS) steels, and irradiation damage formation and evolution in Ferritic/Martensitic steels for which the experiments can be combined with computer modeling to reproduce the observed defect structures and kinetics of microstructure evolution under irradiation. Such studies are aimed at providing detailed knowledge of the irradiation-induced processes leading to macroscopic changes.

**Everyone is welcome to attend. All Mechanical Engineering graduate students are required to attend the seminar. Light refreshments will be served.**

**Friday, November 7, 2008**

**2:00 PM, Room B201, [300](#) Main Street**