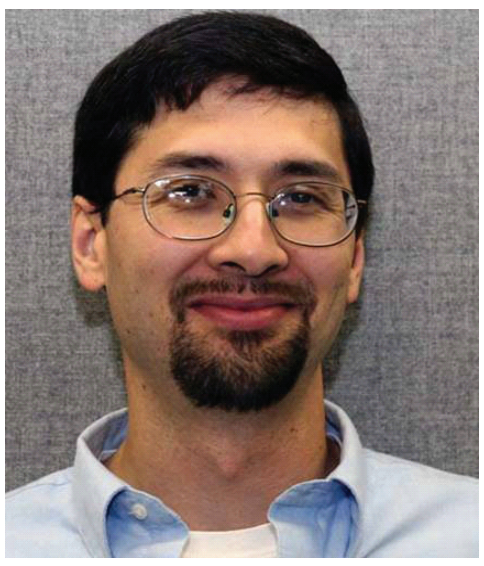
2012-2013

Graduate Seminar Series

The Department of Mechanical Engineering – Engineering Mechanics

Proudly Presents

Dr. Arnold Lumsdaine
Fusion Energy Division
Oak Ridge National Laboratory



Dr. Lumsdaine currently works as the Senior Research and Development Engineer at Oak Ridge National Laboratory in the Fusion Energy Division. He serves in a lead engineering and project management role for the design and analysis of a variety of components related to fusion energy research projects at Oak Ridge National Laboratory. Dr. Lumsdaine received his Ph.D. in Mechanical Engineering from the University of Michigan. He has served as an Associate Professor at the University of Tennessee, an Assistant Professor at the University of Texas-Pan American in Edinburg, Texas, and was the Research and Development Manager for the Nanomechanics Operations of Agilent Technologies and MTS Nano Instruments. He has over 40 publications in the fields of fusion technology, nanomechanics, smart structures, design optimization and vibration damping.

Thursday, Oct. 18, 2012 4:00 – 5:00 p.m. Room 112, ME-EM Bldg.

"Making a Star on Earth – the Future of Fusion Energy"

Nuclear fusion is the primary source of energy in the universe, powering all active stars including our sun. The realization of commercially viable fusion power would essentially end the current societal problems of energy supply (greenhouse gas emission, release of other pollutants, fuel importation from hostile nations, non-renewable supply, storage of long-term radioactive waste, risk of runaway reaction or meltdown, risk of proliferation of nuclear materials). But the promise of achieving power from a controlled fusion reaction has thus far been elusive. The ITER magnetic fusion device, currently under construction in Cadarache, France, is the largest scientific experiment ever undertaken, and promises to produce 500 megawatts of output power and only 50 megawatts to operate.

This presentation will review:·

the basic concepts in magnetic confinement fusion ("what is it?");·
the challenges in worldwide energy supply ("why do we need it?");·
the history of magnetic confinement fusion and the status of the ITER experiment ("where are we now?");·
the major issues that remain to be solved to achieve commercial fusion power, and the role that engineers will play in solving these issues ("what's next, and what can I do about it?").

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http://blogs.mtu.edu/mechanical/category/seminars/