

Mechanical Engineering @ Iowa State



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ME professor discusses future of the U.S. fuel tax

Ross Morrow, assistant professor of mechanical engineering and economics, is cited in *The New York Times* Dot Earth blog [discussing the future of U.S. fuel tax](#) as one of the authors in a soon-to-be-released report from Harvard's Belfer Center for Science and International Affairs, where he was formerly a fellow.

Morrow also [discussed the topic](#) in an interview with Bloomberg Television.

ME department to cosponsor Society of Engineering Science meeting

[The 47th Annual Technical Meeting of Society of Engineering Science](#) will be held at Iowa State University on October 4–6, 2010. A team of representatives from the Departments of Aerospace Engineering, Materials Sciences and Engineering, Mechanical Engineering, and the College of Engineering will be working together to coordinate the meeting.

The overarching theme of the conference is multiscale multiphysics phenomena, and it will have the following general topical tracks: biomechanics, computational methods, dynamics, fluid mechanics, mechanics of materials and structures, multiphysics phenomena, and nondestructive evaluations.

The Society of Engineering Science fosters and promotes the exchange of ideas and information among the various disciplines of engineering and the fields of physics, chemistry, mathematics, and bioengineering, as well as related scientific and engineering fields. SES conferences are recognized as leading forums for bringing together diverse, interdisciplinary groups of researchers to discuss advances in highly focused symposia.

BodyViz Breaks Through

Is Eliot Winer and Jim Oliver's 3-D medical imaging software "disruptive technology"? Learn more about the business challenges a young tech start-up faces in "[BodyViz Breaks Through](#)" in Innovate Online.

Got news or a photo op coming up?

The Department of Mechanical Engineering wants to get the word out about interesting projects or activities going on in our classes or research laboratories. If you have an event or are working on a neat experiment, please let [Jessi Strawn](#) know so she can coordinate photography and news coverage.

Levitas publishes in PRL

Valery Levitas, Schafer 2050 Challenge Professor at Iowa State University, has recently published a breakthrough paper entitled "Displacive Phase Transitions at Large Strains: Phase-Field Theory and Simulations" in *Physical Review Letters* (PRL), the world's foremost physics journal providing rapid publication of short reports of significant fundamental research.

Levitas and colleagues Vladimir Levin, Konstantin Zingerman, and Eugene Freiman, who are from three Russian universities, resolved a long-standing problem in the theory of martensitic phase transformations in solids. Namely, they developed both an advanced theory and simulation approaches to martensitic phase transformations in solids for the most general case of large strains and crystal lattice rotations. The new approaches provide opportunities to model various phase transformations and microstructure evolution that could not be analyzed by previous small-strain theories.

These mechanically induced transformations include phase transformation from graphite to diamond, as well as transformations in steels, electronic materials (like germanium and silicon), intermetallics (e.g., nickel-aluminum alloys), superhard ceramics (e.g., boron nitride), geological materials, and shape memory alloys. Materials also experience large strains during phase transformations in high-pressure applications and in defect-free nanovolumes and nanofilms.

Microstructure evolution in a sample with two nanovoids was studied in the paper as an example. A similar approach can be applied for twinning, dislocations, and phase transformations in soft matter, like biological and polymeric materials. This paper (PRL, 2009, 103, 025702) has been also selected and republished by the *Virtual Journal of Nanoscale Science and Technology*.

Upcoming department seminars

The following seminars will feature finalists for the ME department chair position and will be held at 10:30 a.m. in 2004 Black on the dates indicated below. Each candidate will present a seminar that will cover his vision for the department. All interested are welcome to attend.

- David Rosen, professor and associate chair in the mechanical engineering school at Georgia Tech, will present March 25.
- Zhuomin Zhang, professor in the mechanical engineering school at Georgia Tech, will present March 29.
- George Voyiadjis, distinguished professor and chair of the civil and environmental engineering department at Louisiana State University, will present March 31.

Do you have department news you'd like to share? Please e-mail news items for InCyde Mechanical Engineering to Jessi Strawn at jlstrawn@iastate.edu

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