



The Materials
Information Society

CANTON-MASSILLON CHAPTER



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Micromechanics of Composites and Nanocomposites with Plastic, Ceramic, and Metal Matrices

At first linearly thermoelastic composite media are treated, which consist of a homogeneous matrix containing a statistically homogeneous random set of ellipsoidal uncoated or coated inclusions. One presents a critical analysis of basic concepts of micromechanics (constitutive equation, homogeneous comparison medium, Green function, Eshelby tensor, effective field hypothesis **H1**, and bridging nanomechanics to micromechanics) as well as their possible generalization in some particular problems.

We will analyze so-called ideal cluster materials that contain the finite or infinite, deterministic or random ellipsoidal domains called particle clouds distributed in the composed matrix.

Nanoclay composite is modeled in the framework of continuum mechanics by the aligned, uniformly distributed in the polymer matrix the stacks (clusters) of parallel clay sheets separated from one another by interlayer matrix galleries of nanometer scale.

Nonlinear micromechanical problems of strength, elastoplastic deformation, failure of composites as well as power-law creep of suspensions are considered.

A general theory of plasticity is developed for arbitrary loading based on incremental elastoplastic analysis. The consideration of inhomogeneity of plastic strains in the coating enables to obtain some principally new effects of elastoplastic deformation.

About the Speakers

As a Senior Scientist with over twenty years of experience leading cross-functional teams in micromechanics of microinhomogeneous media, Dr. Buryachenko has conducted research in many branches micromechanics such as particular and fiber reinforced composites, nanocomposites, geomaterials, and thermo-elasto-plasticity and visco-plasticity of composites. He has earned his Masters in Mathematics from Moscow State University, a PhD in Materials Science at the Research Institute of Chemical Engineering in Moscow, and his D. Sc. in Solid Mechanics from the S.P. Timoshenko Institute of Mechanics in Kiev.

2008-2009 ASM Canton-Massillon Chapter Technical Meeting Schedule

2ND Thursday Each Month

<u>Date</u>	<u>Event</u>	<u>Speaker</u>	<u>Topic</u>
September 11th, 2008	Technical Meeting	Valeriy Buryachenko, Micromechanics & Composites LLC.	Micromechanics of Composites and Nanocomposites with Plastic Matrix, Ceramic Matrix, and Metal Matrix
October 9th, 2008	Technical Meeting	Shuvo Roy, Cleveland Clinic	Nanotechnology & BioMEMS
November 13th, 2008	Technical Meeting	TBA	Patent Law
December 11th, 2008	Holiday Event		
January 8th, 2009	ASM International Trustee Night	TBA	TBA
February 12th, 2009	Technical Meeting	TBA	TBA
March 12th, 2009	Social	TBA	Wine Tasting Event
April 9th, 2009	Local Plant Tour	TBA	TBA
May 14th, 2009	Student Night	Short Talks by Local Students	Science Fair Winners
June 2009	Summer Golf Outing		

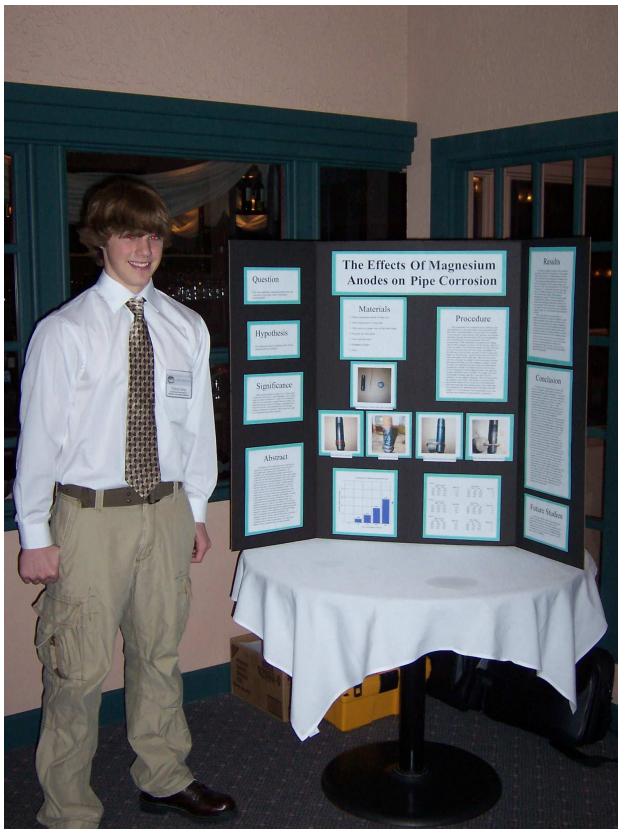
Miss Student Night? Here's what happened.



Science Fair Award winner Jaron Lohmeyer (Louisville HS) and our chapter president



Stephanie (2008-09 VP) and Beth (2008-09 Secretary) with student guests



Travis Gray (Louisville HS) and his winning project



Samantha Loutsenheiser (Hoover HS) project winner

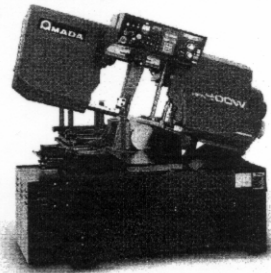
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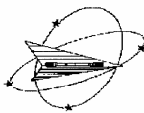


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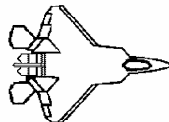


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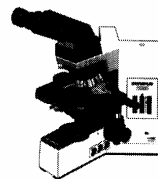
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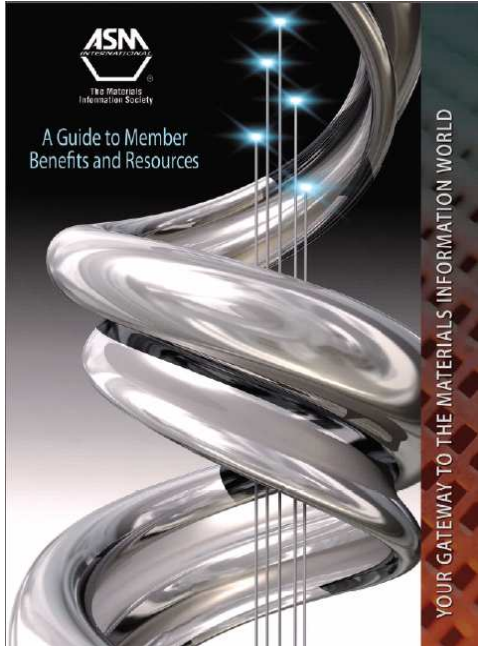
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