Invited Lecturers

Ozan Akkus - Purdue University, USA:
Composition and hierarchical organization of bone; Nanoscale architecture of bone from the fracture resistance perspective; Roles of mineral, collagen and non-collagenous proteins in bone's fracture.

David Burr - Indiana University, USA:
How to write a scientific paper/evaluate the scientific literature; Research design in experimental biology; Fundamental bone biology; Bone dynamics informs bone mechanics.

Roger Chan - University of Texas Southwestern Medical Center, USA:
Biomechanics of voice production; Viscoelasticity of vocal fold tissues; Extracellular matrix scaffolds for tissue engineering; Tissue mechanics: Rheometric measurements.

Wayne Chen - Purdue University, USA:
Mechanical response of soft tissues to high-rate loading; Mechanical response of soft tissues to high-rate loading; Physics of traumatic brain injury.

Patrick Onck - University of Groningen, The Netherlands:
Highly-porous (cellular) materials: stiffness, strength and failure; Deformation of cross-linked biopolymer networks: the actin cytoskeleton.

Peter McHugh - National University of Ireland, Ireland:
Tissue and cell modelling: passive and active mechano-biological models; Medical implants and the mechanics of their interaction with tissue and cells.

Eric Nauman - Purdue University, USA:
Mixture theory: foundations and mechanics of tissues at high strain rates, optimizing the drug delivery to tumors, multiscale modeling in the central nervous system.

Thomas Siegmund - Purdue University, USA:
Nonlinear constitutive models for soft tissue and implication to function; From stress analysis to healing: linking finite elements, computational fluid mechanics and inflammatory agent-based models; Nonlinear failure models for bone: fracture mechanics and potential clinical diagnosis.

General Information

The 2012 IUTAM Summer School on Biomechanics of Tissue and Tissue-Cell Interaction will be held at Purdue University, West Lafayette, Indiana, U.S.A., from June 5 to June 8, 2012.

Successful research in the mechanics of biological tissues contributes both to advances in health care. Research at this interface between technical and applied mechanics and biology requires a strong interdisciplinary environment to address the complex research problems and to successfully transition research findings into applications. With the each of research areas contributing to tissue biomechanics rapidly advancing individually, combined efforts in biological sciences, biomedical imaging, and experimental mechanics as well as in mechanistic modeling and simulation provide a rich ground for fruitful collaborative work. The goal of the summer school is to introduce participants to the state-of-the-art tissue in the biomechanics of bone, ligament, tendon and soft tissue, to interactions between mechanical loading and cellular response, and to the mechanics of interaction between extra-cellular matrices and cells, to the micro- and nano-scale deformation and failure processes of skeletal tissues, as well as to relevant biomedical image modalities. Participants will be introduced to Pathways to translation of the rich results emerging from fundamental biomechanical studies into the developments of biomedical treatment approaches will be reviewed. Biological problem statements in the field will be introduced. Participants will also be introduced to techniques of reading the literature in biological sciences. Participants of the summer school will not only participate in a series of lectures and seminars but will also rotate through relevant engineering and biomedical research laboratories, and present their own work in poster sessions.

PURDUE UNIVERSITY

2012 IUTAM Summer School

Biomechanics of Tissue and Tissue-Cell Interaction

Hosted by

Purdue University
College of Engineering

School of Mechanical Engineering

June 5 to June 8 2012
West Lafayette, Indiana, U.S.A.

Preliminary Announcement
June 2011

IUTAM

Lecturers

All lectures will be given in English. Lecture notes can be downloaded from the Summer School website (instructions to be provided to participants).

The course is addressed to doctoral students and young researchers.

Admission and Accommodation

Applicants are encouraged to contact the organizers for their intent to attend the Summer School. Applications must be submitted at least by May 1, 2012.

For participants not supported by their own institutions fellowships to cover registration fee and or lodging may be available. Such requests are to be sent to the organizer by April 1, 2012. A resume, a statement of purpose and a letter of recommendations confirming the lack of institutional funding shall be provided.

Accommodation for participants will be available on the campus of Purdue University. Various levels of accommodations are available. Furthemore, hotel rooms are available in West Lafayette.

Travel and local information about Purdue University will be available at the website.

Contact

For further information contact:

Prof. Thomas Siegmund,
School of Mechanical Engineering,
Purdue University, West Lafayette, IN 47907,
U.S.A.,
Phone: 765 494 9766
Email: siegmund@purdue.edu

Website

Further information on the Summer School can be found at:

http://engineering.purdue.edu/PU-IUTAM-SS2012/