TECHNISCHE UNIVERSITÄT WIEN

INSTITUT FÜR ANGEWANDTE PHYSIK
Institute of Applied Physics
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IAP-SEMINAR

ANNOUNCEMENT

Date: **Tuesday, 19.4.2016**
Time: **16:00 p.m.**
Location: **Technische Universität Wien, Institut für Angewandte Physik, E134**
yellow tower „B“, 5th floor, Sem.R. DB gelb 05 B (room number DB05L03), 1040 Wien, Wiedner Hauptstraße 8-10

Lecturer: **Prof. Dr. Christian Hellmich**
TU Wien, Institute for Mechanics of Materials and Structures

Subject: **Civil engineering mechanics – development and latest trends**

Abstract:
Engineering mechanics has its root in the 18th century, when Euler extended the Newtonian single forces to volume force densities, and was later extended to its full technological maturity by Cauchy, who in the early 19th century introduced the concept of surface force densities, also called mechanical stress. This has boosted continuum mechanics as the backbone of the industrial revolution in structural engineering - with the Eiffel tower as its pre-eminent epitome.
Since the 1970s, a novel type of continuum mechanics theories have been developed, which, rather than building large structures from centimeter-scaled elementary volumes (of steel, concrete etc.), allow for learning about the mechanical interactions of the matter found WITHIN the aforementioned volumes. This has added a fundamentally new dimension to the field called material science.
Such micromechanical or multiscale mechanics developments are particularly thriving since the turn of the millennia, and after reviewing key notions of continuum mechanics and their historical development, the present talk will present examples of how engineering mechanics has become the central science for unraveling the governing microstructural elements in key construction and biomedical materials; such as the cement hydrate network in concrete, or the biologically synthesized, organically reinforced nano-ceramic called „bone“.

All interested colleagues are welcome to this seminar lecture
(45 minutes presentation followed by discussion).

U. Diebold e.h.
(Seminar-Chairperson)

H. Störi e.h.
(LVA-Leiter)