

Kolloquium



RUHR-UNIVERSITÄT BOCHUM

UNIVERSITÄT DORTMUND



Mechanik

Vortragsankündigung

- Referent:** **WOLFGANG EHLERS**
Institute of Applied Mechanics (CE), University of Stuttgart
- Thema:** **ADVANCES IN POROUS MEDIA THEORIES
WITH APPLICATION TO ENGINEERING
AND BIOMECHANICAL PROBLEMS**
- Ort:** **Ruhr-Universität Bochum
Raum IA 3/21**
- Zeit:** **Mittwoch, den 20.11.2002
15:00 Uhr**
- Inhalt:**

Continuum mechanics of porous materials which are saturated by a fluid pore content touches a variety of problems stemming from the fields of civil engineering, mechanical engineering or biomechanical engineering, etc. Basically, there is the porous solid skeleton with elastic, viscoelastic, elasto-plastic or elasto-viscoplastic material properties on the macroscale, generally related to the respective intrinsic behaviour on the microscale, where the solid deformation is strongly coupled with the viscous fluid flow of the pore content. In addition, it may occur that electro-chemical reactions have to be taken into consideration to describe, e. g., the swelling and shrinking behaviour of biological tissues or of geomaterials like soft clay or shale.

The present contribution concentrates on the fundamental ideas and concepts of the Theory of Porous Media, its numerical implementation into the FE tool PANDAS and the computation of a diversity of initial boundary-value problems ranging from the classical consolidation problem of geotechnical engineering to biomechanical problems like the swelling of soft tissues under finite viscoelastic deformations. In addition, localization phenomena are discussed and computed for a biphasic material of solid and pore-liquid (soil and pore-water) as well as for partially saturated soil described in the frame of a triphasic material consisting of the soil skeleton, pore-water and pore-gas. It is furthermore demonstrated that a fluid pore-content, in the case of open cell foams, must be taken into consideration, whenever fast deformations occur giving reason to a concentration of the pore pressure in the kernel of the particular foam material, e. g., in an automotive seat cushion under impact loading.

Veranstalter:
O.T. Bruhns, K. Hackl, J.F. Kalthoff, S. Reese (Ruhr-Universität Bochum)
H. Obrecht, B. Svendsen, K. Thermann (Universität Dortmund)

Internet: www.am.bi.ruhr-uni-bochum.de/kolloquium.html