ESI Erwin Schrödinger International Institute for Mathematics and Physics

universität wien

DVR 0065528

ESI SENIOR RESEARCH FELLOW LECTURE COURSE

Summer Term 2017

The Erwin Schrödinger International Institute of Mathematics and Physics (ESI) of the University of Vienna offers the following Lecture Course held by a Senior Research Fellow in residence during the Summer Term 2017:

Mathematical Methods in Continuum Mechanics of Solids
Tomáš Roubíček (Charles University, Prague)

Lecture Course (250122 VO): March to June 2017
Friday 11:45 - 13:15 hrs
Start: March 3, 2017

Problem Class (250123 PS): March to June 2017
Friday 13:15 - 14:00 hrs
Start: March 3, 2017

Venue: ESI, Schrödinger Lecture Hall

Abstract: The course will be focused on evolution problems arising in continuum mechanics and thermomechanics solids under small or large strains. Rigorous formulation of initial-boundary-value problems and existence of their solutions will be tackled via some constructive approximation (conceptually leading to implementable computer algorithms) and proving their stability (a-priori estimates) and convergence. The presented material should provide skills to formulate mathematically various physically consistent models arising in solid mechanics and thermomechanics and to perform their basic mathematical analysis, leading possibly to numerically stable, convergent, and implementable computational algorithms.

Content:
Part I. Brief introduction and mathematical prerequisities.
Part II. Linear rheological models at small strains.
Part III. Nonlinear materials with internal variables at small strains.
Part IV. Thermodynamics of selected materials and processes.
Part V. Evolution at large strains.

Some lecture notes will be made available during the course. These will consist from selected parts of an advanced textbook (coauthored by M.Kružík) currently being prepared for Springer Verlag.

For further details see the course website:
http://www.esi.ac.at/activities/events/2017/tomas-roubicek-senior-fellow-course-2017

Christoph Dellago
Director