Dear Colleagues!

Institute of Mathematics of the University of Georgia is pleased to invite you to the Online Tbilisi Analysis & PDE Seminar. The seminar is held bi-weekly on Mondays at $20:00$ local time in Tbilisi.

Talk on May 9, 2022

Speaker: Prof. **Volker Mehrmann**, TU Berlin, Germany;
https://www.bimos.tu-berlin.de/menue/bimos_people/members/professors/volker_mehrmann/

The title of the lecture: **"Modeling analysis and numerical simulation of multi-physical systems: A change of paradigm"**

Abstract: Most real world dynamical systems consist of subsystems from different physical domains, modeled by partial-differential equations, ordinary differential equations, algebraic equations, combined with input and output connections. To deal with such complex systems, in recent years the class of dissipative port-Hamiltonian (pH) systems has emerged as a very efficient new modeling methodology. The main reasons are that the network based interconnection of pH systems is again pH, Galerkin projection in PDE discretization and model reduction preserve the pH structure and the physical properties are encoded in the geometric properties of the flow as well as the algebraic properties of the equations. Furthermore, dissipative pH system form a very robust representation under structured perturbations and directly indicate Lyapunov functions for stability analysis. We discuss dissipative pH systems and describe, how many classical models can be formulated in this class. We illustrate some of the nice algebraic properties, including local canonical forms, the formulation of an associated Dirac structure, and the local invariance under space-time dependent diffeomorphisms. The results are illustrated with some real world examples.

Date: May 9, 2022
Time: $20:00$ local time in Tbilisi;
(**Compare to your local time**: https://www.timeanddate.com/worldclock/georgia/tbilisi);

How to join:

The seminar is organized on the **Cisco Webex Meetings**. If you are already registered, you do not need to register again. Otherwise, to join the seminar please send an e-mail to **seminarim@ug.edu.ge** or register here:

https://forms.gle/xfQJ9fg1uqe7CrZw6

You will then receive further information.

WEB of Seminar: https://www.ug.edu.ge/en/tbilisi-analysis-and-pde-seminars

Organizers:

1. R. Duduchava, Institute of Mathematics, University of Georgia, Tbilisi
2. E. Shargorodsky, Department of Mathematics, King's College London
3. G. Tephnadze, Institute of Mathematics, University of Georgia, Tbilisi

Secretary:

M. Tsaava, Institute of Mathematics, University of Georgia, Tbilisi

Technical support:

G. Tutberidze, Institute of Mathematics, University of Georgia, Tbilisi
Z. Vashakidze, Institute of Mathematics, University of Georgia, Tbilisi