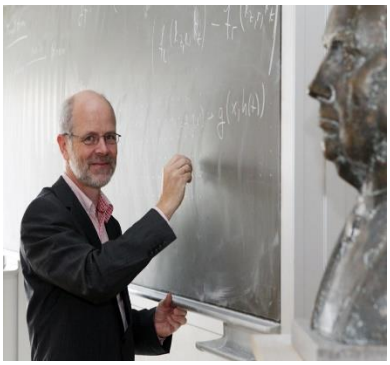
# Tbilisi Analysis & PDE Seminar



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 16:00 GMT (at 17:00 CET, at 20:00 local time in Tbilisi).

**Talk on December 20:**

**Speaker:** Prof. Dr. Alexander Mielke, Weierstrass Institute for Applied Analysis and Stochastics and Humboldt-Universität zu Berlin;
https://www.wias-berlin.de/people/mielke/ ;

**The title of the lecture:** "On a rigorous derivation of a wave equation with fractional damping from a system with fluid-structure interaction".

**Abstract:** We consider a linear system that consists of a linear wave equation on a horizontal hypersurface and a parabolic equation in the half-space below. The model describes longitudinal elastic waves in organic monolayers at the water-air interface, which is an experimental setup that is relevant for understanding wave propagation in biological membranes. We study the scaling regime where the relevant horizontal length scale is much larger than the vertical length scale and provide a rigorous limit leading to a fractionally damped wave equation for the membrane. We provide the associated existence results via linear semigroup theory and show convergence of the solutions in the scaling limit. Moreover, based on the energy–dissipation structure for the full model, we derive a natural energy and a natural dissipation function for the fractionally damped wave equation with a time derivative of order 3/2.

**Date:** December 20, 2021;
**Time:** 16:00 GMT (17:00 CET and 20:00 local time in Tbilisi);
**How to join:**
The seminar is organized on the platform of WEBEX. 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, Tbilis
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
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