Dear Colleagues!

V. Kupradze 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 Wednesday at 20 : 00 local time in Tbilisi.

Talk on October 15, 2025

Speaker: Prof. **Dmitri Kuzmin**, TU Dortmund.
`https://wwwold.mathematik.tu-dortmund.de/lsiii/cms/en/mitarbeiter/member/id=Dmitri+Kuzmin.html`

"Property-preserving finite element discretizations of nonlinear conservation laws"

Abstract: . This talk is a review of modern algebraic flux correction tools for incorporating appropriate inequality constraints (such as positivity preservation) into finite element schemes for nonlinear hyperbolic problems. In particular, we present monolithic convex limiting (MCL) techniques for generic scalar equations, for the compressible Euler equations, and for incompressible flows of fiber suspensions. The validity of discrete maximum principles is enforced using representation of spatial semi-discretizations in terms of admissible intermediate states. If necessary, additional limiting is performed to achieve entropy stability. In our MCL schemes for systems, problem-dependent bounds are imposed on scalar functions of conserved variables to ensure physical and numerical admissibility of approximate solutions. We prove the claimed properties of our flux-corrected schemes, discuss relevant implementation details, and show numerical examples.

Reference:

D. Kuzmin and H. Hajduk, Property-Preserving Numerical Schemes for Conservation Laws. World Scientific, 2023, https://doi.org/10.1142/13466

Date: October 15, 2025
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 **Google Meet Platform**. If you are already registered, you do not need to register again. Otherwise, to join the seminar please send an e-mail to **kim@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. A. Meskhi, Kutaisi International University, Kutaisi

Secretary:

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

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Technical support:

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

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