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Editorial

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EDITORIAL

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This issue of *Applications of Mathematics* is devoted to the Seminar on Numerical Analysis 2017 (SNA'17) held in New Aula of the VŠB—Technical University of Ostrava, January 30–February 3, 2017, and organized by the Institute of Geonics of the Czech Academy of Sciences in collaboration with IT4Innovations National Supercomputing Centre.

The history of Seminar on Numerical Analysis (SNA) goes back to 2003. In 2005–2015, SNA was organized annually by the Institute of Geonics and Institute of Computer Science of the Czech Academy of Sciences in cooperation with Charles University in Prague, Czech Technical University, and VŠB—Technical University of Ostrava. Since 2016, Seminar on Numerical Analysis is organized alternatively on a biannual basis with the EMS School in Applied Mathematics (ESSAM).

The scope of the seminar ranges from mathematical modeling and simulation of challenging engineering problems, to methods of numerical mathematics, numerical linear algebra, and high performance computing. An important part of SNA has been devoted to its Winter School with several longer lectures or tutorials focused on selected topics within the scope of the meeting. This year part of the Winter School was also the course Parallel Linear Algebra organized within the French PRACE Advanced Training Centre Maison de la Simulation. SNA'17 was attended by 77 participants, who presented six invited Winter School lectures, 24 short communications, and several posters.

The whole series of Seminar on Numerical Analysis & Winter School together with the last meeting SNA'17 were influenced by Ivo Marek, member of SNA scientific committee, an outstanding world-known Czech mathematician, Professor at Charles University and Czech Technical University, who unexpectedly passed away in August 2017. We will miss him as an excellent mathematician and genuine friend, always willing to help his students and colleagues.

The current issue of *Applications of Mathematics* contains eight papers. The author of the first paper Owe Axelsson analyzes two preconditioning techniques for two-by-two block linear systems with square matrix blocks. The paper presents new,

shorter, and generally applicable approach for their derivation, implementation and eigenvalue analysis, including a survey of some important applications. The paper by Radim Blaheta and Tomáš Lubner is on block diagonal preconditioning of specific augmented linear systems that arise in the discretization of the Biot-Barenblatt model with double porosity/double permeability flow in porous media. Vít Dolejší and Filip Roskovec present a contribution to the understanding of the dual weighted residual method in the context of discontinuous Galerkin discretizations of linear boundary value problems. The focus is on goal-oriented error estimates including the algebraic component of the error. The paper of Jiří Hozman and Tomáš Tichý is devoted to a numerical method for pricing European basket Asian option with fixed strike. Using a suitable transformation, the problem is reduced to the two-dimensional equation belonging to the class of convection-diffusion problems and solved by the discontinuous Galerkin method. The paper of Petr Kurfürst and Jiří Krtička deals with numerical modeling of some astrophysical processes including, e.g., an interaction between an expanding supernova-remnant sphere and surrounding circumstellar media. The contribution of Jitka Machalová and Horymír Netuka is devoted to the contact problem of the Gao beam with a deformable foundation. The problem is solved by a recently developed control variational method. The paper written by Martin Mrovec discusses numerical approaches to a low-rank tensor structured representation of Slater-type and Hydrogen-like orbitals which arise in electronic structure calculations. The authors Petr Vodstrčil, Jiří Bouchala, Marta Jarošová and Zdeněk Dostál contribute to the understanding of the condition number of the Schur complements of subdomain stiffness matrices in the H-TFETI method for massively parallel solution of large discretized two-dimensional partial differential equations governed by Laplacian.

This special issue also contains the obituary devoted to Professor Ivo Marek and written by Radim Blaheta and Miroslav Tůma. We would like to thank to all contributing authors for the support of Applications of Mathematics. Let us also thank the anonymous referees for their expert opinions and recommendations.

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