

Second International Workshop Numerical Solution of Fractional Differential Equations and Applications NSFDE&A'22

Sunday 05 June 2022 - Friday 10 June 2022

Sozopol, Bulgaria

Scientific Programme

Second International Workshop

Numerical Solution of Fractional Differential Equations and Applications

NSFDE&A'22

Sozopol, Bulgaria

SCIENTIFIC PROGRAM

Eastern European Summer Time (GMT+3)

Sunday, June 5

14:00 – 15:00 Registration

15:00 – 17:00 Face-to-face discussion

Numerical methods for fractional diffusion problems and applications: new opportunities and challenges

Moderators S. Harizanov, S. Margenov

Monday, June 6

09:45 – 10:00 Opening

Chairperson R. Lazarov

10:00 – 10:45 N. Kopteva

Pointwise-in-time a-priori and a-posteriori error control for time-fractional parabolic equations

10:45 – 11:15 A. Cardone

High order collocation methods for fractional differential equations

Coffee Break

11:45 – 12:15 A. Cardone, G. Frasca-Caccia

A conservative numerical method for a time fractional diffusion equation

12:15 – 12:45 S. Apostolov, Y. Dimitrov, V. Todorov

Second order approximations of the Caputo derivative with variable parameters

12:45 – 13:15 N. Garg, A.S.V. Ravi Kanth

Numerical treatment and analysis for a class of multi-term time-fractional Burgers-type equations

Tuesday, June 7

Chairperson S. Margenov

09:30 – 10:15 L. Aceto

Numerical approximations of fractional powers of operators

10:15 – 10:45 C. Hofreither

Rational approximation methods with arbitrary degrees of numerator and denominator

Coffee Break

11:15 – 11:45 H. Sun, Z. Wang, J. Nie, Y. Zhang, R. Xiao

Generalized finite difference method for a class of multidimensional space-fractional diffusion equations

11:45 – 12:15 R. Ciegis, I. Dapsys

On stability, convergence and scalability analysis of parallel algorithms for solution of parabolic problems with fractional power elliptic operators

12:15 – 12:45 M. Kuchta

Fractional operators in coupled multiphysics problems with implicit coupling

Lunch Break

Chairperson S. Margenov

15:00 – 15:30 D. Bolin

Numerical approximation and Bayesian inference of fractional SPDEs

15:30 – 16:00 S. Momani, I. Batiha

Numerical simulations and stability analysis for a fractional-order model on COVID-19

16:00 – 16:30 L. Vulkov

Parameter identification for a time fractional parabolic system of fractured porous media

16:30 – 17:00 M. Koleva, L. Vulkov

Analytical and numerical simulation of atmospheric dispersion by subdiffusion equations with vertical degeneration

17:00 – 17:45 V. Voller

Enthalpy solution of a two-dimensional fractional Stefan problem

Wednesday, June 8

Chairperson S. Harizanov

09:00 – 09:30 V. Kiryakova

Images of special functions under generalized fractional calculus' integrals and derivatives

09:30 – 10:00 S. Tersian

Multiple solutions for a fractional discrete p-Laplacian boundary value problem

10:00 – 10:30 A. Pskhu

Boundary value problems for fractional PDEs

10:30 – 11:00 N. Popivanov, E. Moiseev, Y. Boshev

Pohozhaev identities and applications to nonlinear mixed type equation

Coffee Break

11:30 – 12:00 P. Vabishchevich

Exponent splitting schemes for evolution equations with fractional powers of operators

12:00 – 12:30 D. Slavchev, S. Margenov

On the application of HSS-compression for numerical solution of space-fractional parabolic problems: complexity and scalability

12:30 – 13:00 N. Kosturski, S. Margenov, Y. Vutov

BURA based non-overlapping domain decomposition preconditioning

13:00 – 13:30 S. Harizanov, I. Lirkov, S. Margenov

BURA(q, α, k) preconditioning in multiscale and multiphysics problems

Thursday, June 9

Chairperson N. Ilieva

09:30 – 10:00 I. Katarov, N. Ilieva, L. Drenchev
Kinetic Monte-Carlo modeling of the effects of the stress field generated by $1/2[111]$ screw dislocations on carbon diffusion in bcc Iron

10:00 – 10:30 A. Pashov, Sh. Pashova, P. Petrov
Graph representation of the IgM antibody repertoire

Coffee Break

11:00 – 11:30 P. Petkov, N. Ilieva, E. Lilkova, L. Litov
Orchestrated membrane penetrations as a means of studying peptide-membrane specific affinity

11:30 – 12:00 Y. Cheng, X. Peng, P. Petkov, N. Ilieva
Impact of the grafting topology on the geometry and dynamics of the prospective Parkinson inhibitor MCoCP4

12:00 – 12:30 N. Todorova, M. Rangelov, P. Petkov, N. Ilieva, E. Lilkova, L. Litov
Computational modeling of the replicase-transcriptase complex of SARS-CoV-2

12:30 – 13:00 E. Lilkova, N. Ilieva, P. Petkov, L. Litov
Computational modelling of the interaction of hIFN γ C-terminal peptide and heparin-derived oligosaccharides