Workshop on Numerical and Symbolic Scientific Computing

September 20-23, 2021

Sofia, Bulgaria

organized by

Institute of Information and Communication Technologies
Bulgarian Academy of Sciences

Institute of Mathematics and Informatics
Bulgarian Academy of Sciences

Laboratory of Information Technologies
Joint Institute for Nuclear Research, Dubna, Russia

in association with
Section "Biomathematics and Scientific Computing"
Union of Bulgarian Mathematicians
and
Bulgarian Section of the Society for Industrial and Applied Mathematics

Program

Tuesday, September 21

09:00 – 09:30 **Registration and opening**

Chairperson: R. Lazarov

09:30 – 90:55 Jan Busa, Meshcheryakov Laboratory of Information Technologies

09:55 – 10:20 Emanouil Atanassov, HPC Center of IICT - features and perspectives

10:20 – 10:50 ***Coffee break***

Chairperson: A. Ayriyan

10:50 – 11:20 Velin Andonov, Stoyan Poryazov and Emiliya Saranova, On the Conceptual and Analytical Modeling of an Overall Telecommunication System with Queuing

11:20–11:40 Jan Busa, Numerical solution of a system of equations arising in telecommunication system modeling

11:40–12:00 Ivan Hristov, Radoslava Hristova, Stefka Dimova, Igor Puzynin, Taisiya Puzynina, Zarif Sharipov, Zafar Tukhliev, Newton's method for computing arbitrary precision periodic orbits

12:00 – 13:00 *Lunch*

13:00 – 13:45 *Visit to HPC and Dada Center of IICT-BAS*

Chairperson: S. Harizanov

14:00–14:20 Nevena Ilieva, Peicho Petkov, Miroslav Rangelov, Elena Lilkova, Nadezhda Todorova, Leandar Litov, Cytokines activity impairment through heparin – molecular mechanism and therapeutic potential

14:20–14:40 Elena Lilkova, Peicho Petkov, Rositsa Marinova, Leandar Litov, Nevena Ilieva, Observation of charge-dependent membrane-destruction modes in AMP-membrane interactions

14:40–15:00 Dina Badreeva, Effect of charged lipids on amyloid-beta peptide interactions with a phospholipid membrane within molecular dynamics approach

15:00 – 15:20 Zarif Sharipov, Molecular dynamic simulation of the impact of shock waves on the defective structure of tungsten

15:20 – 15:40 *Coffee break*

Chairperson: J. Busa Jr.

15:40 – 16:10 Stanislav Harizanov, Nikola Kosturski, Ivan Lirkov, Svetozar Margenov, Yavor Vutov, Reduced Multiplicative (BURA-MR) and Additive (BURA-AR) Best Uniform Rational Approximation Methods and Algorithms for Fractional Elliptic Equations

16:10–16:30 Jan Broulim, Parallel techniques in error correction coding for lowering the probability of errors. Software acquisition system for S-CUBE experiment

16:30 – 17:00 Oksana Streltsova, Inna Kolesnikova, Application of Modern Information Technologies for Biological Tasks (joint project of LRB and MLIT JINR)

18:00 – 21:00 **Welcome dinner**

Wednesday, September 22

Chairperson: J. Busa

09:00– 09:30 Alexander Ayriyan, Construction of the quark-hadron phase transition in core of neutron stars

09:30 – 10:00 Hovik Grigorian, Numerical modeling of neutron star cooling

10:00–10:30 *Coffee break*

10:30–11:00 Elena Zemlyanaia, MPI-HPC analysis of complex physical systems: some examples

11:00 – 11:30 Igor Pelevanyuk, Use of distributed resources from the performance perspective

11:30–12:00 Denis Yanovich, Parallel and Distributed Computation of Involutive and Groebner Bases Using the Tableau Representation of Polynomials

12:00 – 14:00 **Lunch**

Chairperson: E. Zemlyanaia

14:00–14:20 Jan Busa Jr., Caching Functions' Values Using Linked List of Trees

14:20–14:50 Nadezhda Bunzarova and Nina Pesheva, TASEP model - numerical and analytical studies and its applications

14:50–15:10 **Coffee break**

15:10–16:30 Special session dedicated to the 95-th anniversary of the birth of Evgeny Petrovich Zhidkov.

16:30–17:30 Open problem presentations and discussions

Thursday, September 23

09:00 – 17:00 Social program

The event will take place at the room 256 of the Institute of Mathematics and Informatics, Sofia, Acad. G. Bonchev Str., Bl. 8