Scientific Programme
International Conference on Mathematical Methods and Models (Biomath 2023), 18-23 June 2023, Pomorie, Bulgaria

08:00 – 08:50	**Registration.**	**SYS Lecture**: Maya Mincheva, Biodynamics of reaction networks
09:00 – 09:20	**Opening**	
		Chair: Roumen Anguelov
09:20 – 10:05	**Keynote**: Irini Doytchinova	*Novel acetylcholinesterase inhibitors developed by structure-based drug design in DDBL@MUS*
10:05 – 10:50	**Keynote:** Andreas Deutsch	*Mechanisms of cancer invasion and progression: insights from cellular automaton models*
10:50 – 11:10	**Tea/Coffee**	
		Chair: Andreas Deutsch
11:10 – 11:35	Mirosław Lachowicz	*Self-organization or disorder phenomena in biology*
11:35 – 12:00	Svetoslav Nikolov	*A mathematical model for compression of poroviscoelastic biological material-like articular cartilage*
12:00 – 12:25	Ryszard Rudnicki	*Some aspects of mathematical modelling of cell cycle*
12:25 – 12:50	Katarzyna Pichór	*A general model of immune status*
12:50 – 14:00	**Lunch**	
		Chair: Irini Doychinova
14:00 – 14:25	Mariyana Atanasova	*In silico screening of natural compounds and discovery of novel acetylcholinesterase inhibitors*
14:25 – 14:50	Ivan Dimitrov	*PreDQ - a software tool for peptide binding prediction to HLA-DQ2 and/or HLA-DQ8*
14:50 – 15:15	Anjana Ghelani	*Genome variation analysis and strategic clustering to sub-lineage of double mutant strain B.1.617 of SARS-CoV-2 t*
15:15 – 15:40	Anelia Horvath	*Identification and analysis of cell-specific expressed genetic variants from scRNA-seq data*
15:40 – 16:05	Julien Vincent	*Modelling horizontal gene transfer of plasmid-mediated resistance in biofilms*
16:05 – 16:30	**Tea/Coffee**	
		Chair: Ami Radunskaya
16:30 – 16:55	Maria C. A. Leite	*Modeling the control of breathing using a Boolean framework*
16:55 – 17:20	Nikolet Doneva	*In silico immunogenicity prediction of viral proteins*
17:20 – 17:45	Monika J. Piotrowska	*Analysis of a basic mathematical model of CAR-T cell therapy for glioblastoma*
17:45 – 18:10	Urszula Foryś	*Periodic treatment in a mathematical model of CAR-T cell therapy for glioblastoma*
19:30 – 20:30	**Welcoming Cocktail (Lobby of the hotel)**	

Tuesday	20 June 2023	
		Chair: Yves Dumont
09:00 – 09:45	**Keynote:** Ami Radunskaya	*Mathematical challenges in triggered drug delivery: getting the right dose to the right place at the right time*
09:45 – 10:30	**Keynote:** Somdatta Sinha	*Modelling cellular processes: from single cells to collective behaviour*
10:30 – 11:00	**Tea/Coffee (Bring all posters to the Vista Hall, where the tea/coffee is)**	
		Chair: Michael Chapwanya
11:00 – 11:25	Yves Dumont	*About sterile insect control strategies in a two patches system*
11:25 – 11:50	Daiver Cardona-Salgado	*Optimal control approach for establishing Wolbachia in wild population of Aedes aegypti mosquitoes*
11:50 – 12:15	Jacek Banasiak	*Impact of demography on the dynamics of malaria*
12:15 – 12:40	Ivric Valaire Yatat-Djeumen	*About sterile females contamination and residual fertility in a mosquito control program using the Sterile Insect Technique. Impact on Dengue control.*
12:40 – 12:50	**Conference Photo**	
12:50 – 14:00	**Lunch (All posters to be displayed)**	
		Chair: Hristo Kojouharov
14:00 – 14:25	Stanislav Sotirov	*Assessment of human proteins for potential tumour immunogenicity by in silico models*
14:25 – 14:50	Marek Bodnar	*Mathematical model of CAR-T therapy taking into account cells targeting off-tumour antigens*
14:50 – 15:15	Ivanka Stamova	*On the qualitative analysis of fractional-order impulsive gene regulatory networks*
15:15 – 15:40 15:40 – 16:05	Charlise Basson & Avulundiah Edwin Phiri	*Mathematical modelling for CTCE-9908 (a CXCR4 inhibitor) on B16 F10 melanoma cell proliferation:* *Part I and Part II*
16:05 – 16:30	**Tea/Coffee**	
		Chair: Jean Lubuma
16:30 – 16:55	Hong-Ming Yin	*On an optimal control problem arising from the tumor treatment*
16:55 – 17:20	Mmatlou S. Kubyana	*Adaptive strategies destabilise the rock-paper-scissors game but increase the eco-evolutionary performance*
17:20 – 18:20	**Poster Session (posters to remain displayed until 16:30 on 21 June)**	
18:30 – 19:30	**Open ISC Meeting**	**SYS Lecture:** Ami Radunskaya How to get the most out of a model

Posters	
Yusuke Asai	*Evaluation of the effectiveness of health countermeasures against infectious disease arrival times*
R. Anguelov, C. Basson, A. E. Phiri	*Mathematical modelling for CTCE-9908 (a CXCR4 inhibitor) on B16 F10 melanoma cell proliferation*
Milen Borisov	*On the construction of amiloid growth models*
Daiver Cardona-Salgado	*Modeling the introduction of sterilizing treatment for tuberculosis in low- and middle-income countries*
Eunjin Eom	*Construction of a new infectious disease model using the time delay*
Slavi Georgiev	*Dynamical analysis combined with parameters identification for a model of infection in honeybee colonies with social immunity*
Ivan M. Ivanov	*Ultrasound experimental model for knee joint intra-articular movements*
Elena V. Nikolova	*Analytical and numerical study of a diffusive predator-prey model incorporating an Allee effect*
Peter Rashkov	*Time-scale separation in models for dengue fever*
Fatima Sapundzhi	*The impact of molecular docking programs and virtual screening in modern drug design*
Stoyan Stoytchev	*Estimation of the parameters of a mathematical model for articular cartilage compression*
Ivan Trenchev	*Integrating Mixed Reality Technologies in Genomic Data Visualization and Analysis for Bioinformatics Research*
Iryna Zabaikina	*Quantifying noise modulation from coupling of stochastic expression to cellular growth: an analytical approach*

Wednesday	21 June 2023	
		Chair: Greg Rempala
09:00 – 09:30	**Invited**: Manuel Molina	*A stochastic model to mathematically describe the dynamics of long-lived raptor species*
09:30 – 10:00	**Invited:** Miguel González	*Controlled branching processes as models for logistic population growth*
10:00 – 10:30	**Invited:** Inés del Puerto	*Multitype controlled branching process as a model for progenitor cell populations*
10:30 – 11:00	**Tea/Coffee**	
	Session A	**Chair:** Alf Gerisch
11:00 – 11:25	María Vela-Pérez	*Modeling the COVID-19 incorporating variants and vaccines*
11:25 – 11:50	Arsène Jaures Ouemba Tassé	*Influence of the co-dynamics Ebola-COVID-19 in the population*
11:50 – 12:15	Slavi Georgiev	*Optimal coefficient restoration for COVID-19 epidemic modelling*
12:15 – 12:40	Fawaz K. Alalhareth	*Analysis and an NSFD method of a model of bacterial competition in the presence of a plasmid*
	Session B	**Chair:** Stoyan Stoytchev
11:00 – 11:25	Claudia Timofte	*Asymptotic analysis for diffusion problems in thin periodic media*
11:25 – 11:50	Zirhumanana Balike	*Mathematical modeling of trace-metals precipitation in biofilms*
11:50 – 12:15	Ahmed Fathi	*Upscaling a mixed-culture biofilm model in homogeneous porous media via multiscale asymptotics approach*
12:15 – 12:40	Andrey Vassilev	*The hybrid Gompertz distribution - derivation, characterization and estimation (a reaction network treatment)*
12:40 – 14:00	**Lunch**	
		Chair: Jacek Banasiak
14:00 – 14:25	Petra Macková	*Distributional solutions of nonlinear diffusion equations with a moving Dirac source term*
14:25 – 14:50	Ekaterina Auer	*Predicting Hereditary BRCA1/2 Mutations Using Publicly Available Data*
14:50 – 15:15	Maya Mincheva	Identifying parameter values for oscillations in reaction networks
15:15 – 15:40	Sara Hamis	*Spatial cumulant models enable spatially informed treatment strategies in theoretical cancer systems*
15:40 – 16:05	Jean Lubuma	On reliable numerical methods for some real-life differential equation models with singularities
16:05 – 16:30	**Tea/Coffee**	
	Section A	**Chair:** Manuel Molina
16:30 – 16:55	Nikolay Yanev	*Nonhomogeneous multitype Markov branching stochastic processes as models of cell population dynamics*
16:55 – 17:20	Boseung Choi	*Statistical model for identification of the relationship between SARS-CoV-2 prevalence and wastewater concentration with vaccination and delta variant mutation*
17:20 – 17:45	Marta Tyran-Kamińska	*A stochastic model of seasonal savanna*
	Section B	**Chair:** Claudia Timofte
16:30 – 16:55	Nadezhda Zh. Bunzarova	*On an integrable version of the generalized totally asymmetric simple exclusion process on open chains*
16:55 – 17:20	Schehrazad Selmane	*Demographic and epidemiological characteristics of animal bites in the North West Health Region, Algeria*
17:20 – 17:45	Yibeltal Adane Terefe	*Impact of self-protection measures to reduce antibiotic resistant gonorrhoea infection*
18:30 – 23:00	**Official Dinner**	

Thursday	22 June 2023	
08:30 – 15:30	**Excursion**	
15:30 – 16:00	**Tea/Coffee**	
		Chair: Mirosław Lachowicz
16:00 – 16:25	Dariusz Wrzosek	*Pursuit-evasion dynamics in predator-prey models*
16:25 – 16:50	Pravin Dudhagara	*Response surface designs and R package based modelling for predictive capabilities, sensitivity and validation of model for improving the bacterial growth, laccase production, and textile dye decolorization alongside a detoxification study*
16:50 – 17:15	Morelyn Sigauke	*Analysis of the transmission dynamics of pneumonia disease in a developing country: the effect of environment on pneumonia transmission, significance of hospital and community based care*
17:15 – 17:40	Michael Chapwanya	*Pattern formation in the Holling-Tanner predator-prey model with prey-taxis*
17:40 – 18:05	Hristo V. Kojouharov	*Higher-order modified nonstandard finite difference methods for autonomous dynamical systems*

Friday	23 June 2018	
		Chair: Somdatta Sinha
09:00 – 09:45	**Keynote:** Alf Gerisch	*Exploring the spatial tissue environment: non-local modelling, applications, numerical challenges*
09:45 – 10:30	**Keynote**: Greg Rempala	*Modeling biological systems using dynamical survival models. Lessons from the recent pandemic.*
10:30 – 11:00	**Tea/Coffee**	
		Chair: Peter Rashkov
11:00 – 11:25	Jian-Jun Shu	*Fat-tail test of regulatory DNA sequence*
11:25 – 11:50	Nadia Antonova	*On the analysis of hemorheological data with mathematical models*
11:50 – 12:15	Svetoslav Markov	*The SEI epidemiological model generates natural classes of biological functions: analysis using reaction network theory*
12:15 – 14:00	**Lunch**	