



**BIOMAT Consortium
International Institute for
Interdisciplinary Sciences**

**BIOMAT 2021 – 21st International Symposium on
Mathematical and Computational Biology**

ON-LINE VERSION, NOVEMBER 01 - 05, 2021

BIOMAT 2021 INTERNATIONAL SYMPOSIUM / SCIENTIFIC PROGRAMME

BIOMAT 2021	Monday November 01	Tuesday November 02	Wednesday November 03	Thursday November 04	Friday November 05
10:00am-10:15am GMT	OPENING SESSION	KT = Keynote Talk, KTT = Keynote Tutorial Talk, CT = Contributed Talk			
10:15am-11:05am GMT	KT1 Lucia Maddalena ITALY	KT5/KTT2 Kovács HUNGARY	KT9 Bratus RUSSIA	KT13 Somdatta Sinha INDIA	KT16 Bairagi INDIA
11:05am-11:30am GMT	CT1 Pelissier-Tanon FRANCE	CT5 Chatterjee INDIA	CT9 Isroilov UZBEKISTAN	CT13 Morgado FRANCE	CT19 Di Domenico FRANCE
11:30am-12:00pm GMT	BREAK				
12:00pm-12:50pm GMT	KT2/KTT1 Srivastava INDIA	KT6 Hidirova UZBEKISTAN	KT10 Samares Pal INDIA	KT14 Monasson FRANCE	KT17 Lefraich MOROCCO
12:50pm-01:15pm GMT	CT2 Dénes HUNGARY	CT6 Das INDIA	CT10 Chaudhary INDIA	CT14 Majumder INDIA	CT20 Boldog HUNGARY
01:15pm-01:45pm GMT	BREAK				
01:45pm-02:35pm GMT	KT3 Baldi USA	KT7 Sivaloganathan CANADA	KT11/KTT3 Maini UK	KT15 Röst HUNGARY	KT18 Venturino ITALY
02:35pm-03:00pm GMT	CT3 Rajput INDIA	CT7 Tanvi INDIA	CT11 Alvino DOMINICAN REPUBLIC	CT15 Kovács, Gyorgy, Gyúró HUNGARY	CT21 Ganguly INDIA
03:00pm-03:25pm GMT	CT4 Ibrahim EGYPT/HUNGARY	CT8 Marzban IRAN/HUNGARY	CT12 Khyar MOROCCO	CT16 Redondo COLOMBIA	CT22 Oporku-Sarkodie GHANA/HUNGARY
03:25pm-03:55pm GMT	BREAK				
03:55pm-04:20pm GMT	KT4 Tuszynski CANADA	KT8 Pardalos USA	KT12/KTT4 Grosberg USA	CT17 Mondaini BRAZIL	CT23 Singh INDIA
04:20pm -04:45pm GMT				CT18 Albuquerque Neto BRAZIL	CLOSING SESSION
04:45pm - GMT			BIOMAT CONSORTIUM GENERAL ASSEMBLY	DIRECTOR BOARD MEETING	

All times are in GMT (Greenwich Mean Time), please convert in your local time/ THE SPEAKER'S NAME AND AFFILIATION ARE IN BOLD AND UNDERLINED TYPE.

Nov 01 Monday, 10:00 am - 10:15 am - Opening Session

Nov 01, Monday, 10:15 am - 11:30 am - 1st Session

10:15 am - 11:05 am - KT1- "WHOLE-GRAPH EMBEDDING AND ADVERSARIAL ATTACKS FOR LIFE SCIENCES"-**Lucia Maddalena**, M. Giordano - **National Research Council, Institute for High-Performance Computing and Networking (ICAR), Italy**; M. Manzo - ITS, University of Naples "L'Orientale", Italy; M.R. Guarracino - University of Cassino and Southern Lazio, Italy, and National Research University /Higher School of Economics, Russia.

11:05:am - 11:30 am - CT1 -"PHOTOCHEMICAL SCHEME FOR REVERSIBLY PHOTOSWITCHABLE FLUORESCENT PROTEINS USED IN BIOLOGICAL IMAGING" - **Agnes Pelissier-Tanon**; R. Chouket, T. Le Saux, L. Julien, A. Espagne - **PASTEUR, Département de Chimie, École Normale Supérieure, PSL University, Sorbonne Université, CNRS, France**; A. Lemarchand, Sorbonne Université, CNRS, France.

Chair: R.P. Mondaini

Nov 01, Monday, 12:00 pm - 01:15 pm - 2nd Session

12:00pm - 12:50 pm - KT2/KTT1 - "ROLE OF INFORMATION AND SATURATED TREATMENT IN INFECTIOUS DISEASE MODELS"- **Prashant K. Srivastava, Department of Mathematics, Indian Institute of Technology, Patna, India.**

12:50 pm - 01:15 pm - CT2 - "EPIDEMIC MODEL FOR RISK-BASED TESTING AND QUARANTINE"- **Attila Dénes, Bolyai Institute, University of Szeged, Hungary.**

Chair: Nandadulal Bairagi

Nov 01, Monday, 01:45 pm - 03:25 pm - 3rd Session

01:45 pm - 02:35 pm - KT3 - "DEEP LEARNING IN THE BIOMEDICAL SCIENCES" - **Pierre Baldi, Department of Computer Science, Institute for Genomics and Bioinformatics, Center for Machine Learning, University of California, Irvine, USA.**

02:35 pm - 03:00 pm - CT3- "A NONLINEAR MATHEMATICAL MODEL WITH VACCINATION IN INDIA: OPTIMAL INTERVENTION" - **Ashutosh Rajput, Department of Mathematics, Faculty of Mathematical Sciences, Univerity of Delhi, India**; Rajiv Aggarwal, Department of Mathematics, Deshbandhu College, University of Delhi, India, Tanvi, Department of Mathematics, Faculty of Mathematical Sciences, University of Delhi, India.

03:00 pm - 03:25 pm - CT4 - "MATHEMATICAL MODELLING OF COVID-19 TRANSMISSION BETWEEN HUMANS AND MINKS"- **Mahmoud A. Ibrahim, Bolyai Institute, University of Szeged, Hungary**; Attila Dénes, Bolyai Institute, University of Szeged, Hungary.

Chair: Lucia Maddalena

Nov 01, Monday, 03:55 pm - 04:45 pm - 4th Session

03:55 pm - 04:45 pm - KT4 - "PROBABILISTIC DISTRIBUTIONS OF P53 MUTATIONS AND THEIR CORRESPONDING SHANNON ENTROPIES IN DIFFERENT CANCER CELL TYPES"- S. Arbabi Moghadan, Sara Ibrahim Omar, **J.A. Tuszyński, Department of Physics, Department of Oncology, University of Alberta, Canada**; DIMEAS Politecnico di Torino, Italy.

Chair: E. Venturino

Nov 02, Tuesday, 10:15 am – 11:30 am – 5th Session

10:15 am – 11:05 am – KT5/KTT2 – “OSCILLATIONS IN BIOLOGICAL SYSTEMS” – Sándor Kovács, Department of Numerical Analysis, Eötvös Loránd University, Hungary.

11:05 am – 11:30 am – CT5 – “IMPLEMENTATION OF THE FUNCTIONAL RESPONSE IN MARINE ECOSYSTEM: A STATE-OF-THE-ART PLANKTON MODEL” – A. Chatterjee, Department of Mathematics, Barrackpore Rastraguru Surendranath College, India; Samares Pal, Department of Mathematics, University of Kalyani, India.

Chair: R. Monasson

Nov 02, Tuesday, 12:00 pm – 01:15 pm – 6th Session

12:00 am – 12:50 pm – KT6 – “METHOD FOR MATHEMATICAL MODELING OF ORGANS AND TISSUES, REGULATORIKA AT THE CELLULAR LEVEL”- Mahruy Saidalieva, Mohiniso Hidirova, “Regulatorika” Department, Science and Innovation Center for Information and Communication Technologies, Tashkent, Uzbekistan.

12:50 pm – 01:15 pm – CT6 – “EFFECT OF INCUBATION DELAY IN SIR MODEL: HOPF BIFURCATION AND STABILITY SWITCH”- Tanuja Das, Prashant K. Srivastava, Department of Mathematics, Indian Institute of Technology, Patna, India.

Chair: A. Lemarchand

Nov 02, Tuesday, 01:45 pm - 03:25 pm - 7th Session

01:45 pm – 02:35 pm – KT7 – “MATHEMATICAL MODELS OF ACOUSTICALLY INDUCED VAPORIZATION OF ENCAPSULATED NANODROPLETS” – K. Jiang, M. Ghasemi, A. Yu, University of Waterloo, Canada; S. Sivaloganathan, Center for Mathematical Medicine, The Fields Institute, Totonto, Canada.

02:35 pm - 03:00 pm – CT7 – “A FRACTIONAL ORDER MODEL FOR COVID-19 WITH PREVENTION MEASURES AND VACCINATION IN INDIA”- Tanvi, Department of Mathematics, Faculty of Mathematical Sciences, University of Delhi, India; Rajiv Aggarwal, Department of Mathematics, Deshbandhu College, University of Delhi, India; Ashutosh Rajput, Department of Mathematics, Faculty of Mathematical Sciences, University of Delhi, India

03:00 pm – 03:25 pm – CT8 – “A HYBRID PDE – ABM MODEL FOR VIRAL DYNAMICS WITH APPLICATION TO SARS-COV-2 AND INFLUENZA” – S. Marzban, R. Han, N. Juhász, G. Röst, Bolyai Institute, University of Szeged, Hungary.

Chair: J. Tuzsynski

Nov 02, Tuesday, 03:55 pm – 04:45 pm – 8th Session

03:55 pm - 04:45 pm - KT8 - “ARTIFICIAL INTELLIGENCE IN BIOMEDICINE”- Panos Pardalos, University of Florida, Gainesville, USA.

Chair: Mohiniso Hidirova

Nov 03, Wednesday, 10:15 am – 11:30 am - 9th Session

10:15 am – 11:05 am - KT9 – “EXISTENCE OF CLOSED TRAJECTORIES IN LOTKA-VOLTERRA SYSTEMS IN R^n ” - **A. Bratus, Russian University of Transport; Moscow Center of Fundamental and Applied Mathematics, Lomonosov Moscow State University, Russia**; V. Tikhomirov, R. Isaev, The Faculty of Computational Mathematics and Cybernetics, Lomonosov Moscow State University, Russia.

11:05 am – 11:30 am – CT9 – “MATHEMATICAL MODELING OF REGULATORY MECHANISMS OF INTERRELATED FUNCTIONING BETWEEN A HUMAN BRAIN AND VARIOUS ORGANS” - **M.B. Hidirova, Sh.Yu. Isroilov, Scientific and Innovation Center of Information Technologies, Tashkent University, Uzbekistan.**

Chair: G. Röst

Nov 03, Wednesday, 12:00 pm – 01:15 pm - 10th Session

12:00 pm – 12:50 pm – KT10 – “MODELLING THE ROLE OF TV AND INTERNET COVERAGE ON MITIGATING THE SPREAD OF INFECTIOUS DISEASES” – Rakesh Medda, Department of Mathematics, University of Kalyani, India; Joydeb Bhattacharyya, Department of Mathematics, Karimpur Pannadevi College, India **Samares Pal, Department of Mathematics, University of Kalyani, India.**

12:50 pm – 01:15 pm – CT10 – “ASYMPTOTIC STABILITY ANALYSIS FOR CHAOTIC PREDATOR-PREY MODEL VIA ACTIVE CONTROLLED HYBRID COMPOUND DIFFERENCE SYNCHRONIZATION STRATEGY” - Ayub Khan, **Harindri Chaudhary, Department of Mathematics, Jamia Millia Islamia, New Delhi, India.**

Chair: M. Guarracino

Nov 03, Wednesday, 01:45 pm – 03:25 pm – 11th Session

01:45 pm – 02:35pm - KT11/KTT3- “MODELLING COLLECTIVE CELL MOVEMENT IN BIOLOGY AND MEDICINE” - **Philip Maini, Wolfson Centre for Mathematical Biology, Mathematical Institute, University of Oxford, UK.**

02:35 pm - 03:00 pm – CT11 – “MODELING COMPETITION IN MOTIONLESS POPULATIONS” – **Hamlet Castillo Alvino, Pontificia Universidad Católica Madre y Maestra, Dominican Republic**; Marcos Marv, Universidad de Alcal, Spain; Ezio Venturino, Dipartimento di Matematica Giuseppe Peano, Universit di Torino, Italy.

03:00 pm – 03:25 pm – CT12 – “MATHEMATICAL ANALYSIS OF A SIHV COVID-19 PANDEMIC MODEL TAKING INTO ACCOUNT A VACCINATION STRATEGY” - **Omar Khyar, Adil Meskaf, Karam Allali, Faculty of Sciences and Techniques Mohammedia, University Hassan II, Morocco.**

Chair: P. Pardalos

Nov 03, Wednesday, 03:55 pm – 04:45 pm – 12th Session

03:55 pm – 04:45 pm – KT12/KTT4 – “CAN ACTIVITY PACIFY FLUCTUATIONS?” - **A. Y. Grosberg, New York University, USA**

Chair: S. Kovacs

Nov 03, Wednesday, 04:45 pm - BIOMAT CONSORTIUM GENERAL ASSEMBLY

Nov 04, Thursday, 10:15 am - 11:30 am - 13th Session

10:15 am - 11:05 am - KT13 - "INFECTION SPREAD IN POPULATIONS: AN AGENT BASED MODELLING APPROACH" - Adarsh Prabhakaran, Department of Physical Sciences, Indian Institute of Science Education and Research, Mohali, Punjab, India; **Somdatta Sinha, Department of Biological Sciences, Indian Institute of Science Education and Research, Mohali, Punjab, Indian Institute for Science Education and Research, Kolkata, India.**

11:05 am - 11:30 am - CT13 - "DERIVATION OF MACROSCOPIC EQUATIONS FROM HOMOGENEOUS THERMOSTATED KINETIC EQUATIONS IN THE CANCER-IMMUNE SYSTEM COMPETITION"- **G. Morgado, L. Masurel, A. Lemarchand, Laboratoire de Physique Théorique de la Matière Condensée, Sorbonne Université, Paris, France;** C. Bianca, Laboratoire de Recherche en Eco-innovation Industrielle et Energétique, Cergy Pontoise, France.

Chair: E. Venturino

Nov 04, Thursday, 12:00 pm - 01:15 pm - 14th Session

12:00 pm - 12:50 pm - KT14 - "MODELING PROTEINS FROM SEQUENCE DATA WITH INTERPRETABLE MACHINE LEARNING METHODS: FROM FITNESS PREDICTION TO DESIGN"- Rémi Monasson, **Laboratoire de Physique Théorique - Ecole Normale Supérieure, Paris, France.**

12:50 pm - 01:15 pm - CT14 - "DYNAMIC ANALYSIS OF A DIFFUSIVE ECO-EPIDEMIC MODEL WITH FEAR EFFECT AND PREDATOR SWITCHING" - **Abhijit Majumder, Nandadulal Bairagi, Department of Mathematics, Centre for Mathematical Biology and Ecology, Jadavpur University, Kolkata, India.**

Chair: A. Dénes

Nov 04 Thursday, 01:45 pm - 03:25 pm - 15th Session

01:45 pm - 02:35 pm - KT15 - "REAL TIME MONITORING OF SOCIAL MIXING PATTERNS DURING THE COVID-19 PANDEMIC AND THEIR IMPLICATIONS TO TRANSMISSION DYNAMICS" - **Gergely Röst, Bolyai Institute, University of Szeged, Hungary.**

02:35 pm - 03:00 pm - CT15 - "OSCILLATIONS IN A SYSTEM MODELLING SOMITE FORMATION"- **Sándor Kovács, Department of Numerical Analysis, Eötvös Loránd University, Budapest, Hungary; Szilvia György, Noémi Gyúró, Eötvös Loránd University, Budapest, Hungary.**

03:00 pm - 03:25 pm - CT16 - "SOCIO-ECOLOGICAL DYNAMICS GENERATED BY HYDROCARBON EXPLORATION" - **J.M. Redondo, Universidad Católica de Colombia, Bogotá, Colombia;** J.S. Garcia, Universidad Nacional de Colombia, Medellín, Colombia; J.A. Amador, Instituto Humboldt, Bogotá, Colombia.

Chair; P. Srivastava

Nov 04, Thursday 03:55 pm - 04:45 pm - 16th Session

03:55 pm - 04:20 pm - CT17 - "GENERALIZED KHINCHIN-SHANNON INEQUALITIES AND THE IDENTIFICATION OF PROTEIN DOMAIN FAMILIES VIA JACCARD-TYPE SYMBOLS - Part I" - **R. P. Mondaini, Simão C. de Albuquerque Neto - Federal University of Rio de Janeiro, Brazil.**

04:20 pm - 04:45 pm - CT18 - "GENERALIZED KHINCHIN-SHANNON INEQUALITIES AND THE IDENTIFICATION OF PROTEIN DOMAIN FAMILIES VIA JACCARD-TYPE SYMBOLS - Part II" - **R. P. Mondaini, Simão C. de Albuquerque Neto - Federal University of Rio de Janeiro, Brazil.**

Chair: Lucia Maddalena

Nov 04, Thursday, 04:45 pm - DIRECTOR BOARD MEETING

Nov 05, Friday, 10:15 am – 11:30 am – 17th Session

10:15 am – 11:05 am - KT16 – “EFFECT OF IMMUNE RESPONSE DELAY IN AN IN-HOST HIV-1 INFECTION MODEL WITH DRUG CONTROL”- Nandadulal Bairagi, Centre for Mathematical Biology and Ecology, Department of Mathematics, Jadavpur University, Kolkata, India.

11:05 am – 11:30 am - CT19 – “ADHERENCE AND SUSTAINABILITY OF INTERVENTIONS INFORMING OPTIMAL CONTROL AGAINST THE COVID-19 PANDEMIC”- Laura Di Domenico, Pierre Louis Institute of Epidemiology and Public Health – Inserm & Sorbonne Université, France.

Chair: Somdatta Sinha

Nov 05, Friday, 12:00 pm – 01:15 pm – 18th Session

12: 00pm – 12:50 pm - KT17- “COMPUTATIONAL MODELING OF CANCER RESPONSE TO ONCOLYTIC VIROTHERAPY: IMPROVING THE EFFECTIVENESS OF VIRAL SPREAD AND ANTI TUMOR EFFICACY” – Hamid Lefraich , Faculty of Sciences and Techniques, Department of Mathematics and Computer Science, Universit, Hassan First, Morocco.

12: 50 pm – 01:15 pm - CT20 – “PROPENSITY MATRIX METHOD FOR AGE DEPENDENT STOCHASTIC INFECTIOUS DISEASE MODELS”- P. Boldog, N. Bogya, Zs. Vizi, Bolyai Institute, University of Szeged, Hungary.

Chair: Samares Pal

Nov 05, Friday, 01:45 pm – 03:25 pm – 19th Session

01:45 pm – 02:35 pm - KT18 – “MODELING THE INSECT-VECTORS-MEDIATED PHYTOPLASM TRANSMISSION IN AGROECOSYSTEM”- Francesca Acotto, Mattia Berera, Giulia Malano, Ezio Venturino – Dipartimento di Matematica Giuseppe Peano, Università di Torino, Italy.

02:35 pm – 03:00 pm - CT21 - “AN INTERDISCIPLINARY MODEL-BASED STUDY ON EMERGING INFECTIOUS DISEASE: THE CURSE OF 21st CENTURY” – Anal Chatterjee, Department of Mathematics, Barrackpore Rastraguru Surendranath College, Kolkata, India; Suchandra Ganguly, University College of Nursing, Kalyani, India.

03:00 pm – 03:25 pm - CT22- “SIRWS SYSTEMS WITH ASYMMETRIC PARTITION OF IMMUNITY PERIOD” – R. Oporoku-Sarkodie, M. Polner, F.A. Bartha, G. Röst, Bolyai Institute, University of Szeged, Hungary.

Chair; H. Lefraich

Nov 05, Friday, 03:55 pm – 04:45 pm – 20th Session

03:55 pm – 04:20 pm - CT23- “ COVID-19 DEATH PREDICTION MODEL BASED UPON VACCINATION DOSES AND UPCOMING CASES” – Vanshika Rustagi, Pooja Mittal, Garima Nagar, Department of Zoology, Deshbandhu College, University of Delhi, India; Archana Singh, Department of Botany, Hansraj College, University of Delhi, India; Indrakant Kumar Singh, Department of Zoology, Deshbandhu College, University of Delhi, India.

Chair: S.C. de Albuquerque Neto

04:20 pm – 04:45 pm - CLOSING SESSION -