



BRICS WORKSHOP ON BIOPHOTONICS - 2024

October 03 - 05, 2024

Organized by

**Department of Atomic and Molecular Physics, MAHE, Manipal, India
Saratov State University, Russia
Hainan University & Huazhong University of Science and Technology, China
University of São Paulo, Brazil
University of Johannesburg, RSA**

**Venue: Silver Jubilee Hall, Manipal School of Life Sciences (MSLS) Annex,
Silver Jubilee Block, MAHE, Manipal – 576 104**

Chairs:

**Prof. Santhosh Chidangil, MAHE, Manipal, India
Prof. Valery V. Tuchin, Saratov State University, Russia
Prof. Qingming Luo, Hainan University, China
Prof. Vanderlei Salvador Bagnato, University of São Paulo, Brazil
Prof. Heidi Abrahamse, University of Johannesburg, RSA**

Co-Chairs:

**Prof. Nirmalya Ghosh, IISER, Kolkata
Prof. Elina A. Genina, Saratov State University, Russia
Prof. Dan Zhu, Huazhong University of Science and Technology, China
Prof. Cristina Kurachi, University of São Paulo, Brazil
Prof. Michael Hamblin, University of Johannesburg, RSA**

Secretaries:

**Dr. Jijo Lukose, MAHE, Manipal, India
Dr. Polina A. Timoshina, Saratov State University, Russia
Dr. Dongyu Li, Huazhong University of Science and Technology, China
Dr. Natalia M. Inada, University of São Paulo, Brazil
Dr. Sathish Kumar, University of Johannesburg, RSA**

PROGRAMME SCHEDULE

<https://conference.manipal.edu/BWB2024/>

DAY -1: 3 rd OCTOBER (THURSDAY)-2024		
08.00 AM - 08.45 AM	Registration	
08.45 AM - 09.25 AM	Breakfast	
09.30 AM- 09.35 AM	Welcome Address by Dr. Santhosh Chidangil Convener and India Chair, BRICS workshop on Biophotonics - 2024	
09.35 AM- 09.40 AM	Overview of the BRICS Conference by Prof. Heidi Abrahamse South Africa Chair BRICS workshop on Biophotonics - 2024	
09.40 AM- 09.50 AM	Inauguration and Inaugural Address by Lt. Gen. (Dr.) M. D. Venkatesh Vice Chancellor, MAHE, Manipal	
09.50 AM- 09.55 AM	Messages from BRICS Chairs Biophotonics Pioneers from India	
09.55 AM- 10.00 AM	Vote of Thanks by Dr. Sajan D. George Convener, BRICS workshop on Biophotonics - 2024	
10.00 AM – 10.40 AM	Keynote Address by: Prof. Heidi Abrahamse University of Johannesburg, South Africa Chair: Prof. Murukeshan Vadakke Matham, NTU Singapore	Phthalocyanine-Based Probes for Alleviating or Evading Tumour-Hypoxia for Enhanced Photo- and Sono-Mediated Therapy
10.40AM-11.00AM	Tea break	
Session 1		
Session Chair: Dr. Satish Rao		
11.00 AM – 11.40 AM	Invited Lecture by Dr. Samir Kumar Pal S N Bose National Centre for Basic Sciences Kolkata	“Probing” Spectroscopic Probes for Non-invasive Simultaneous Disease Diagnosis

11.40 AM – 12.20 PM	Invited Lecture by Dr. Sangeeta Kale Defence Institute of Advanced Technology, Pune, India	Non-Invasive Optical Sensor Setup for Health Monitoring: A Device Perspective
12.20 PM – 01.00 PM	Invited Lecture by Dr. Dalip-Singh Mehta, IIT Delhi, India	Optical Biopsy Assisted with AI/ML: Multimodal and Multispectral Optical Techniques for Real-time Screening

01.30 PM – 02.30 PM	Lunch Break	
Session 2		
Session Chair: Dr. Samir Kumar Pal		
02.30 PM – 03.10 PM	Invited Lecture by Dr. Chandrabhas Narayana Rajiv Gandhi Centre for Biotechnology Thiruvananthapuram, India	Protein structure-function, drug discovery and diagnostics with Raman spectroscopy
03.10 PM – 03.50 PM	Invited Lecture by Dr. Blassan George University of Johannesburg, South Africa	Pheophorbide-a Mediated Photodynamic Therapy in breast and lung cancer cells in vitro
03.50 PM – 04.20 PM	Invited Lecture by Dr. Anine Crous University of Johannesburg, South Africa	Photobiomodulation for Enhanced Differentiation of Adipose-Derived Stem Cells into Brain Organoids and Osseous Tissue
04.20 PM – 04.35 PM	Tea Break	
04.35 PM – 05.15 PM	Invited Lecture by Mr Brendon Roets University of Johannesburg, South Africa	Progressing Stem Cell Regenerative Therapy via Photobiomodulation to Facilitate Tenocyte Differentiation.
Program of the 3rd BRICS Workshop on Biophotonics October 03 –05, 2023, Manipal, INDIA		
Online session (Moscow time (UTC+3)/Brazil time/India time/RSA time/China time		
Day 1: https://zoom.us/j/92134283523?pwd=TPa3EHSvwlQd8JNqAgUoiwlatthkAP.1		
Passcode: 835556		
Session Chair: Prof. Qingming LUO, Hainan University, China Dr. Santhosh Chidangil, Manipal Academy of Higher Education, India		

15.25-15.45/9.25-9.45 /17.55-18.15 15.25-15.45/20.25-20.45	Welcome words from Prof. Valery V. Tuchin , Institute of Physics and Science Medical Center, Saratov State University and Prof. Qingming LUO , Hainan University, China.	
15.45-16.05/9.45-10.05 /18.15-18.35 14.45-15.05/20.45-21.05	Invited Lecture Prof. Yao He , Key Laboratory of Optic-Electric Sensing and Analytical Chemistry for Life Science, MOE, Soochow University, China	Fluorescence imaging for precision diagnosis and treatment of diseases
16.05-16.25/10.05-10.25 /18.35-18.55 15.05-15.25/21.05-21.25	Invited Lecture Prof. Valery V. Tuchin , Institute of Physics and Science Medical Center, Saratov State University, Institute of Precision Mechanics and Control, FRS “Saratov Scientific Centre of the RAS”, Saratov, Russia; Laboratory of Laser Molecular Imaging and Machine Learning, Tomsk State University, Tomsk, Russia	Biophotonics has acquired windows of transparency of biological tissues from UV to THz waves
DAY-2: 4th OCTOBER (FRIDAY)-2024		
8.00 AM-9.00 AM	Breakfast	
Session 1		
Session Chair: Dr. Chandrabhas Narayana		
09.00 AM – 09.40 AM	Invited lecture by Dr. Gautham K Samanta , Photonic Sciences Laboratory Physical Research Laboratory (PRL), Ahmedabad-380009, India	Quantum imaging of biological sample using Hong-Ou-Mandel interferometry
09.40 AM – 10.20 AM	Invited Lecture by Dr. Vincent Mathew , Central University Kerala, India	Topological Photonics: Concepts and Applications
10.20 AM – 11.00 AM	Invited Lecture by Dr. Hari M Varma Indian Institute of Technology Bombay India	A novel approach based on stochastic calculus for laser speckle imaging
11.00 AM - 11.15 AM	Tea Break	

Session 2		
Session Chair: Dr. Krishna K Mahato		
11.15 AM – 11.55 PM	Invited Lecture by Dr. C. Murali Krishna ACTREC, Mumbai, India	Serum Raman Theranostics: Perspectives and Outlook
11.55 AM – 12.35PM	Invited Lecture by Dr. Sajan George Vellore Institute of Technology India	Generation of Functional Neurons by Photobiomodulation
12.35 AM – 1.15 PM	Invited Lecture by Dr. AVR Murthy Defence Institute of Advanced Technology (DIAT), Pune, India	Construction of light sheet fluorescence microscope (LSFM) for biophotonic imaging applications
1.15 PM – 02.15 PM	Lunch Break	
Session 3		
Chair: Dr. M.K. Satheesh Kumar		
02.15 PM- 02.55 PM	Invited Lecture by Dr. Santhosh Chidangil Manipal Academy of Higher Education Manipal, India	Single cell spectroscopy of blood components using micro-Raman combined with optical tweezers.
02.55 PM – 04.00 PM	POSTER SESSION	
04.00 pm- 04.15pm	Tea break	
DAY-2, 4th OCTOBER (FRIDAY)-2024		
ONLINE SESSION		
Day 2: https://zoom.us/j/92416948601?pwd=oTi9HatmTF8lmwWygSiL2j7HvSQ4kp.1		
Passcode: 542568		
Session Chair: Valery V. Tuchin , Saratov State University, Russia Santhosh Chidangil , Manipal Academy of Higher Education, India		
13.45-14.05/7.45- 8.05 /16.15-16.35 12.45-13.05/18.45- 19.05	Invited Lecture Prof. Dan Zhu , Wuhan National Laboratory for Optoelectronics, Huazhong University of Science, China	Tissue optical clearing imaging: from in vitro to in vivo
14.05-14.25/8.05- 8.25 /16.35-16.55 13.05-13.25/19.05- 19.25	Invited Lecture Prof. Xuantao Su , School of Integrated Circuits, Shandong University, China	Intelligent imaging flow cytometry for label-free analysis of single cells and exosomes

14.25-14.45/8.25-8.45 /16.55-17.15 13.25-13.45/19.25-19.45	Invited Lecture Prof. Ping Xue , Department of Physics, Tsinghua University, China	Multifunctional OCT for intraoperative tumor diagnosis and rapid pathology
14.45-15.05/8.45-9.05 /17.15-17.35 13.45-14.05/19.45-20.05	Invited Lecture Prof. Siwen Li , State Key Laboratory of Natural Medicines, China Pharmaceutical University, China	Multimodal collaborative tumor precision therapy based on phototherapy
15.05-15.25/9.05-9.25 /17.35-17.55 14.05-14.25/20.05-20.25	Invited Lecture Prof. Wei Chen , School of Mechanical Science and Engineering, Huazhong University of Science and Technology	High spatiotemporal resolution multiphoton microscopy for brain imaging
15.25-15.45/9.25-9.45 /17.55-18.15 14.25-14.45/20.25-20.45	Invited Lecture Dr. Irina V. Semenova , Ioffe Institute of the Russian Academy of Sciences, St. Petersburg, Russia	Potentials of QPI techniques in analysis of cells' response to photodynamic treatment
15.45-16.05/9.45-10.05 /18.15-18.35 14.45-15.05/20.45-21.05	Invited Lecture Dr. Andrei E. Lugovtsov , Laboratory of Biomedical Photonics, Faculty of Physics, Lomonosov Moscow State University, Moscow, Russia	Interaction of erythrocytes with endothelium in microfluidic channels studied by optical techniques
16.05-16.25/10.05-10.25 /18.35-18.55 15.05-15.25/21.05-21.25	Invited Lecture Dr. Victoria V. Zherdeva , Bach Institute of Biochemistry, Research Center of Biotechnology of the Russian Academy of Sciences, Moscow, Russian Federation	Combining MRI and fluorescence imaging for monitoring polyester copolymers' degradation in vivo

DAY-3, 5th OCTOBER (SATURDAY)-2024		
ONLINE SESSION		
Day 3: https://zoom.us/j/96482950308?pwd=btYUaJ5dhU6rRGYv7SXsTLMpGEpypE.1		
Passcode: 690827		
Session Chair: Dr. Vanderlei Salvador Bagnato , University of São Paulo, Brazil		
Dr. Santhosh Chidangil , Manipal Academy of Higher Education, India		
6.20-6.40/00.20-00.40 (05.10.24)/8.50-9.10 5.20-5.40/11.20-11.40	Invited Lecture Dr. Ayan Banerjee Department of Physical Sciences, Center of Excellence in Space Sciences, India (CESSI), IISER, Kolkata-741246, India	Microbubble lithography: using laser manipulated microbubbles towards patterning 'everything' mesoscopic

6.40-7.00/00.40-1.00 /9.10-9.30 5.40-6.00/11.40- 12.00	Invited Lecture Dr. Basudev Roy, Department of Physics, Indian Institute of Technology Madras, Chennai, India	Study of out of plane rotations in optical tweezers and subsequent applications in soft and biological matter systems
7.00-7.20/1.00-1.20 /9.30-9.50 6.00-6.20/12.00- 12.20	Invited Lecture Prof. Mike Hamblin Laser Research Centre, Faculty of Health Sciences, University of Johannesburg, South Africa.	New Applications of Transcranial Photobiomodulation
7.20-7.40/1.20-1.40 /9.50-10.10 6.20-6.40/12.20- 12.40	Invited Lecture Dr. Yulia Svenskaya Science Medical Center, Saratov State University, Russia	Biodegradable vaterite carriers for the delivery of glucocorticoids into hair follicles
7.40-8.00/1.40-02.00 /10.10-10.30 6.40-7.00/12.40- 13.00	Invited Lecture Dr. Yuzhakova V. Diana Research Institute of Experimental Oncology and biomedical technologies, Privolzhsky Research medical University, Nizhny Novgorod, Russia	Optical bioimaging in personalization of cancer treatment
8.00-8.20/2.00-2.20 /10.30-10.50 7.00-7.20/13.00- 13.20	Invited Lecture Prof. Alexander V. Priezzhev Laboratory of Biomedical Photonics, Faculty of Physics, Lomonosov Moscow State University, Moscow, Russia	Application of laser-optical methods for studying microcirculation and microrheology of blood in vivo and in vitro
8.20-8.40/2.20-2.40 /10.50-11.10 7.20-7.40/13.20- 13.40	Invited Lecture Prof. Alexander P. Savitsky A.N. Bach Institute of Biochemistry, Federal Research Centre 'Fundamentals of Biotechnology' of the Russian Academy of Sciences, Moscow, Russia	The role of the trehalose transporter in the photoinactivation of Mycobacterium tuberculosis by near- infrared dye conjugated with trehalose
8.40-9.00/2.40-3.00 /11.10-11.30 7.40-8.00/13.40- 14.00	Invited Lecture Prof. Evgeny Shirshin, Lomonosov Moscow State University, Moscow, Russia	Optical spectroscopy in surgery guidance from laboratory to the clinics
9.00-9.20/3.00-3.20 /11.30-11.50 8.00-8.20/14.00- 14.20	Invited Lecture Dr. Boris Yakimov, Sechenov University, Moscow, Russia	Blood plasma spectroscopy for biomedical diagnostics: recent advances
9.20-9.40/3.20-3.40 /11.50-12.10 8.20-8.40/14.20- 14.40	Invited Lecture Dr. Denis Davydov Lomonosov Moscow State University,	Body composition analysis with a portable NIR device: hydration, fat and muscles

	Moscow, Russia.	
9.40-10.00/3.40-4.00 /12.10-12.30 8.40-9.00/14.40-15.00	Invited Lecture Dr. Sathish Sundar Dhilip Kumar Laser Research Centre, Faculty of Health Sciences, University of Johannesburg, South Africa	The Synergistic Impact of Aloin-Infused Biologically Active Film and Photobiomodulation for Wound Healing
10.00-10.20/4.00-04.20 /12.30-12.50 9.00-9.20/15.00-15.20	Invited Lecture Dr. Rahul Chandran Laser Research Centre, Faculty of Health Sciences, University of Johannesburg, South Africa	Hypocrellin: A natural photosensitizer in the Photodynamic therapy of Breast and Skin cancer'
10.20-10.40/4.20-4.40 /12.50-13.10 9.20-9.40/15.20-15.40	Invited Lecture Dr. Lelo Simelane Laser Research Centre, Faculty of Health Sciences, University of Johannesburg, South Africa	Targeted photodynamic therapy treatment on colorectal tumour spheroids
10.40-11.00/4.40-5.00 /13.10-13.30 9.40-10.00/15.40-16.00	Invited Lecture Dr. Nkune Nkune Laser Research Centre, Faculty of Health Sciences, University of Johannesburg, South Africa	Laser Research Centre, Faculty of Health Sciences, University of Johannesburg, South Africa
11.00-11.20/5.00-5.20/13.30-13.50 10.00-10.20/16.00-16.20	BREAK	
Session chair Prof. Heidi Abrahamse , University of Johannesburg, RSA Prof. Santhosh Chidangil , Manipal Academy of Higher Education, India		
11.20-11.40/5.20-5.40/13.50-14.10 10.20-10.40/16.20-16.40	Invited Lecture Mr. Alex Chota Laser Research Centre, Faculty of Health Sciences, University of Johannesburg, South Africa	Nanoparticles Loaded With Photosensitizer for Enhanced PDT Effects In Breast Cancer Cells
11.40-12.00/5.40-6.00 /14.10-14.30 10.40-11.00/16.40-17.00	Invited Lecture Dr. Victor Chuchin Institute of laser technologies, ITMO University, Russia	Investigation of the dynamics of the skin reflection spectrum as a result of its heating by visible or infrared laser radiation
12.00-12.20/6.00-6.20/14.30-14.50 11.00-11.20/17.00-17.20	Invited Lecture Prof. Vanderlei Salvador Bagnato São Carlos Institute of Physics, University of São Paulo, Brazil	Photodynamic Therapy in Brazil: From cancer to microbiological control
12.20-12.40/6.20-6.40/14.50-15.10 11.20-11.40/17.20-17.40	Invited Lecture Prof. Cristina Kurachi São Carlos Institute of Physics, University of São Paulo, Brazil.	Antimicrobial photodynamic therapy – challenges and strategies for achieving inactivation in biofilms and infected tissues

12.40-13.00/6.40-7.00 /15.10-15.30 11.40-12.00/17.40-18.00	Invited Lecture Dr. Kate Blanco São Carlos Institute of Physics, University of São Paulo, Brazil.	Antimicrobial Resistance: Exploring Photodynamic Therapy as a Solution
13.00-13.20/7.00-7.20 /15.30-15.50 12.00-12.20/18.00-18.20	Invited Lecture Dr. Natalia Mayumi Inada São Carlos Institute of Physics, University of São Paulo, Brazil.	High-grade squamous intraepithelial lesion (HSIL) treatment with photodynamic therapy
13.20-13.40/7.20-7.40 /15.50-16.10 12.20-12.40/18.20-18.40	Invited Lecture Dr. Mirian Denise Stringasci São Carlos Institute of Physics, University of São Paulo, Brazil.	Murine melanoma treatment effects using photodynamic therapy and radiotherapy combination
13.40-14.00/7.40-8.00 /16.10-16.30 12.40-13.00/18.40-19.00	Invited Lecture Dr. Alessandra Ramos Lima Environmental Biophotonics Laboratory, São Carlos Institute of Physics, University of São Paulo, Brazil.	Advances in photonic supplementation in plant cultivation: perspectives and challenges in agriculture
14.00-14.20/8.00-8.20 /16.30-16.50 13.00-13.20/19.00-19.20	Invited Lecture Dr. Denise Maria Zezel Laboratory of Biophotonics, Center for Lasers and Applications – Nuclear and Energy Research Institute, IPEN/CNEN-SP, São Paulo- Brazil.	Hyperspectral imaging pathology shining light on diseases
14.20-14.40/8.20-8.40 /16.50-17.10 13.20-13.40/19.20-19.40	Invited Lecture Dr. Anderson Rodrigues Lima Caires Optics and Photonics Group, Institute of Physics, Federal University of Mato Grosso do Sul (UFMS), Campo Grande, MS, Brazil.	Chlorophyll fluorescence spectroscopy: basics and applications
14.40-15.00/8.40-9.00 /17.10-17.30 13.40-14.00/19.40-20.00	Invited Lecture Dr. Cicero Cena Optics and Photonics Group, Institute of Physics, Federal University of Mato Grosso do Sul (UFMS), Campo Grande, MS, Brazil	Photodiagnosis in Latin America: Some solutions based on Optical Spectroscopy and Machine Learning
15.00-15.20/9.00-9.20 /17.30-17.50 14.00-14.20/20.00-20.20	Invited Lecture Dr. Michelle Barreto Requena São Carlos Institute of Physics, University of São Paulo, Brazil	Optimizing photodynamic therapy for skin cancer using microneedles: a step closer to clinical trials
15.20-15.40/9.20-9.40 /17.50-18.10 14.20-14.40/20.20-20.40	Invited Lecture Dr. Lucas Danilo Dias Universidade Evangélica de Goiás (Brazil)	Development and Application of Photoantimicrobial Films: Potential Use in Packaging and Coating for Medical Devices
15.40-16.00/9.40-10.00 /18.10-18.30 14.40-15.00/20.40-	Invited Lecture Mr. M.Sc. Matheus Garbuio	Photodynamic inactivation against Aedes aegypti larvae.

21.00	Environmental Biophotonics Laboratory, São Carlos Institute of Physics, University of São Paulo, Brazil	
16.00-16.20/10.00-10.20 /18.30-18.50 15.00-15.20/21.00-21.20	Invited Lecture Dr. Pavan Kumar Department of Physics, Indian Institute of Science Education and Research, Pune	Optothermal Tweezers: Dynamic Assembly and Pattern Formation
16.20-16.40/10.20-10.40 /18.50-19.10 15.20-15.40/21.20-21.40	Valedictory function Group photo	