21st IBCAST-2024
International Bhurban Conference on Applied Sciences & Technology
August 20 – 23, 2024

Murree Hills, Pakistan

IBCAST — INTERNATIONAL BHURBAN CONFERENCE ON APPLIED SCIENCES & TECHNOLOGY ★ ISLAMABAD ★

Technical Co-Sponsor
IEEE

Key Dates

May 25, 2024
Paper Submission Deadline

June 30, 2024
Participants Registration Deadline

July 10, 2024
Notification of Paper Acceptance

Conference Committee

Dr. Raza Samar
Patron-in-Chief

Dr. M. Anwar Mughal
Scientific Secretary

Abdul Ahad Qureshi
Coordinator IBCAST

Dr. Khurram Shahzad Sana
Technical Coordinator

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IEEE Publication Chair

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Conference Tracks and Topics

1. Advanced Materials
- Polymers & Polymer Composite Materials
- Polymeric Adhesives and Sealants
- Sandwich Structures and Materials
- Nano-materials and Nanotechnology
- Ceramic Matrix Composites (CMC) and their Applications
- Powder Metallurgy, Advanced Alloys and Metal Matrix Composites (MMC)
- Electro Chemical & Energetic Materials
- Magnetic, Optical and Photonic Materials
- Thin Films, Coating and Surface Technology

2. Aerostructures
- Additive and Innovative Manufacturing Techniques
- Advanced Materials and Composites for Aerostructures
- Aerospace Vehicle Airframe Design, Development, Integration and Qualification
- Supersonic and Hypersonic Propulsion Design
- Structural Integrity and Maintenance
- Ground Support Equipment Design, Analysis and Testing
- Modeling & Simulation of Manufacturing Processes
- FSI and Aerothermal Challenges & Solutions
- Multi-disciplinary Optimization for Light Weight Structures
- Cutting-Edge FEA Techniques
- Static & Dynamic Structural Testing/ Analysis
- Adaptive Structures
- Bio-inspired Morphing

3. Artificial Intelligence & Software Technologies
- AI and Data Engineering
- Indigenization in Robotics and AI
- Generative AI and Recommenders Systems
- Advancements in Software Reliability
- Automated Software Engineering and System Development
- Architectural Design, Patterns & Frameworks and User-Centered Designs
- Software Quality Assurance and Process Improvement
- Real-Time Systems and Domain Applications
- Formal & Model-based Engineering of Critical Systems
- Software Project and Product Management
- Software Fault Tolerance and Fault Containment
- Virtual and Augmented Reality
- AI at the Edge and Swarm Robotics
- High-Integrity Systems and Reliability
- AI in Control Systems (Hybrid Fuzzy Control)
- AI in Healthcare
- Software Verification and Validation.

4. Biosciences
- Components and Tools of Effective Bio-surveillance Program and its Challenges
- Application of Deep Learning in Biological Sciences
- Zoonotic & Vector borne Emerging/ Re-emerging Infectious Diseases and Contributing Factors
- Recent Innovations, Trends, Concerns and Practical Challenges in Lab and Field based Bio-detection Technologies, with special emphasis on Biosensors Development
- Advancement in the Treatment, Vaccine Development, Control/ Prevention of Microbes and their Vectors
- Bioprocessing Challenges for Emerging Therapies
- Collaborative Model of Academia, Industry and Regulators for Innovation in Biological Sciences

5. Control & Signal Processing

Control:
- Aerospace Systems Control
- Nonlinear Systems and Control
- Systems Identification and Adaptive Control
- Optimization and Model Predictive Control
- Variable Structure and Sliding Mode Control
- Advanced Filtering Techniques
- Multi-sensors Data Fusion
- Fault Diagnostics, Detection and Isolation

Conference Tracks and Topics

- Fault-Tolerant Control
- Guidance, Navigation and Control of Autonomous Systems
- Cooperative Guidance and Control of Autonomous Multi-Agents Formation
- Artificial Intelligence in Guidance, Navigation and Control
- Hardware in the Loop Simulations of Autonomous Systems
- Manufacturing Automation and Robotic Control
- Dynamic Modeling and Control of Aero Engines
- Control of Renewable Power Generation Systems and Smart Grids
- Process Control of Chemical and Biological Systems
- Quantum Systems and Control

Signal Processing:
- Computer Vision and Graphics
- Statistical Methods and Learning Algorithms
- Remote Sensing
- Big data and Image/ Audio/ Text/ Analytics
- Pattern Recognition, Bagging and Boosting Classifiers
- Image Recognition and Tracking
- Medical Imaging
- DSP Related RTOS Issues
- Multidimensional Signal Processing and Speech Recognition
- Sensor Networks
- Hyper Spectral and Multi-Spectral Imaging
- Robotic Perception
- 3D Point Cloud Sensing and Processing
- Video Processing and Compression
- Algorithmic Implementation on FPGA/ ASIC/ Embedded Systems
- Quantum Signal Processing
- Signal Processing for Big Data
- Statistical Learning
- Applications of Machine Learning

6. Cyber Security
- Emerging Cyber Threats (Ransomware, Phishing, ATPs and Malware Attacks)
- Threat Intelligence and Incident Response
- Security of Cyber-Physical Systems
- Digital Forensics
- Data Loss Prevention Techniques
- Cloud Security
- IoT Security
- Security Automation using AI
- Hardware Security
- Supply Chain Security
- AI based Threat Detection and Prevention
- Cryptography
- Quantum Technologies including Post Quantum Cryptography
- Blockchain Security
- Cybersecurity Governance

7. Fluid Dynamics
- Gas Dynamics
- Aerodynamics
- Hydrodynamics
- Industrial and Environmental Fluid Dynamics
- Fluid Structure Interactions
- Static and Dynamic Stability of Flying Submersible Vehicles
- Turbulence Modeling
- Air Intake Performance
- Experimental Fluid Dynamics
- Multiphase Flows
- Reactive Flows
- Heat Transfer
- Wind Tunnel – Design, Testing and Visualization
- High and Low Speed Wind Tunnel Design Trends and Considerations
- Designs and Calibration of String Balance and other Instrumentation
- Latest Techniques in High and Low Speed Wind Tunnel Testing
- Scale Down Model – Challenges and Limitations
- Visualization Techniques (PIV, PSP etc)
- Captive Trajectory Simulation (CTS) Challenges and Latest Trends
- Store Release Simulation and Captive Trajectory Systems
- Wind & Water Tunnel Experimental Setup Studies

8. Medical Sciences
This track focuses on the seamless integration of cutting-edge technologies, paving the way for future excellence in patient care, medical breakthroughs, and healthcare systems. Objectives of this year activity are:

- Explore Emerging Technologies
- Foster Collaborative Partnerships
- Showcase Innovative Solutions
- Examine Ethical Implications
- Enhance Healthcare Delivery
- Promote Innovation and Entrepreneurship
- Address Regulatory Challenges
- Disseminate Research Findings
- Inspire Future Leaders

We aim to ignite transformative conversations, foster collaborations, and spark innovation that will shape the future of healthcare, ultimately leading to excellence in patient care and improved health outcomes.

Scientific Committee

Advanced Materials
Dr. Naveed A. Siddiqui

Dr. Mazhar Iqbal

Aerostructures
Dr. Abdur Rauf

Dr. Naeem Zafar

AI & Software Technologies
Dr. Usman Qayyum

Dr. Tahir Jameel

Fluid Dynamics
Dr. Muhammad Rafique

Dr. Basharat Ali Haider

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Dr. Saifullah Khan

Dr. Irfan Ali

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Medical Sciences
Dr. Ayesha Waqar Niazi

Dr. Zeeshan Perwaiz

Underwater Technologies
Dr. Shafiq ur Rehman

Syed Ali Abbas

Wireless Communication & Radar
Dr. Naveed Ahsan

Dr. Abdul Mueed

Organized By
Centres of Excellence in Science & Applied Technologies, Islamabad, Pakistan

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Paper Submission

All submissions will pass through the blind review process by the committee of experts. Necessary instructions are available on the web page. Papers can be submitted through EasyChair:
https://easychair.org/account/signin
https://www.ibcast.org.pk
Accepted and presented papers **(except the Medical Sciences track)** will be published in the IEEE IBCAST Conference Proceedings and submitted to IEEE Xplore.

Conference Venue

Murree is a popular hill station with glorious views of lush green landscapes and mountains. It is situated on the southern slopes of the Western Himalayan foothills. Tourist attractions include Kashmir Point, Patriata, Dunga Gali, Pipeline Track, Bhurban and Nathiagali resorts.

Activity of Medical Sciences track will be held in Islamabad

Accommodation

Accommodation to invited speakers and foreign delegates will be provided for the entire conference duration. Whereas, the contributed paper presenters from Pakistani Institutes will be facilitated for their presentation day only.

Registration Fee

Rs. 20,000
Pakistani Participants & CESAT Speakers

Rs. 12,000
Students from Pakistani Universities

Rs. 10,000
MS Track Participants

$ 500 USD
Foreign Participants

$ 300 USD
Students from Foreign Universities

IEEE members will be discounted by 20%

Conference Tracks and Topics

9. Underwater Technologies

- Underwater Acoustics
- Ambient Noise Measurement and Modelling
- Acoustic Metamaterials and Measurements
- Underwater Communication and Networking
- Networked Underwater Robotic and Systems
- Applications of Machine Learning in Underwater
- Underwater Internet of things (UW-IoT) based Transducer, Modem and Network Designs
- Big Data Analytics for Underwater Technologies
- Cloud based Data Models for Underwater WSN
- Challenges and Security Issues in Underwater Wireless Sensor Networks
- Embedded System Design for Underwater Communication
- Underwater Sensors & Transducers
- Sonar Signal / Image Processing
- Array Signal Processing and Array Design for UW Applications
- Underwater Detection, Classification and Localization
- Synthetic Aperture Sonar (Active and Passive)
- Sonar Imaging and Displays
- Transducer Arrays and Materials
- Sonobuoy Dynamics and Control
- Sonar and Transducer Calibration and Underwater Standards
- Sonar Performance Measurement and Modelling
- Modem Architecture & Software defined Modems for UW Communication
- Passive Sonar Tracking for UUV and Diver Detection
- Naval Architecture
- Platform Integration Analysis for Concept Designs
- Autonomous Underwater Vehicles Design
- Navigation Technologies for Autonomous UW Vehicles
- Unmanned Underwater Vehicles (UUVs)
- Remotely Operated Vehicles (ROVs)
- Batteries for Underwater Vehicles
- Marine Environment and Oceanography
- Hydrography and Seafloor Mapping
- Marine Renewables and Pile Driving
- Offshore Seismic Monitoring and Mitigation
- Geophysical Exploration and Geo Acoustic Inversion

10. Wireless Communication & Radar

Wireless Communication:
- Software defined Radios
- Satellite & Space Communication
- Emerging Wireless Mobile Applications
- Network Centric Warfare
- Electromagnetic Scattering, Channel / Interference Modeling
- Adhoc Networks
- Wireless Technologies in Electro Medical Devices
- Metamaterials, FSSs and Electromagnetic
- Bandgap Structures
- Communication Systems Simulation
- Integrated Transceivers
- Wireless Power Transfer and Energy Harvesting
- Smart Antennas
- MIMO Systems
- Antenna Systems: Theory, Modeling and Measurement
- Internet of Things Near Body Communication

Radar:
- AESA Radar
- Radar Performance Modeling / Measurement
- Radar Signal Processing (Algorithms & Hardware)
- Phased Array Radar Calibration
- Multifunction Phased Array Radar
- Bistatic / Multi-static Radars
- Analog / Digital Beam Forming
- Ultra Wide Band Radar
- Ground Penetrating Radar (GPR)
- MIMO Radars
- Synthetic Aperture Radars SAR/ ISAR
- Space Time Adaptive Processing (STAP)
- RF / Microwave Circuit Design
- RFICs & MMICs
- Reconfigurable Front-ends
- Active / Passive Device Modeling & Circuits
- Computational Electromagnetics
- Radio Imaging including mm-Wave and THz Imaging Systems
- RCS Reduction / Stealth Design
- Antenna Design
- Near Field and Far Field Antenna Characterization
- EMC/EMI

Some tracks will be holding Special Sessions and Workshops on selected topics which will be announced later.

Glimpses of last IBCAST

Organized By

Centres of Excellence in Science & Applied Technologies, Islamabad, Pakistan

Participation Application Form

Copy of CNIC (Front Side)	Copy of CNIC (Back Side)	Latest Photograph

Dr/Mr/Ms:........................Name:...

CNIC: ☐☐☐☐☐ - ☐☐☐☐☐☐☐ - ☐   Passport: ....

Date of Birth..   Nationality: ....

Email:...   Country of Origin: ....

Mob: ....Landline: ....Fax:...

Mailing Address:..

EDUCATIONAL

University	Highest Degree	Year	Subject
....	....	....	....
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OCCUPATION

Institution	Post	Period
....	....	....
....	....	....

PAPER PRESENTER   Yes ☐   No ☐

Paper Title: ....

....

IBCAST Track:..Paper ID: ....

TRACKS OF INTEREST   (Select three tracks with priority)

☐ Advanced Materials   ☐ Aerostructures   ☐ Artificial Intelligence & Software Technologies

☐ Biosciences   ☐ Control & Signal Processing   ☐ Cyber Security   ☐ Fluid Dynamics

☐ Medical Sciences*   ☐ Underwater Technologies   ☐ Wireless Communication & Radar

*Activity of Medical Sciences track will be held in Islamabad