



9th

IBCAST-2012

International Bhurban Conference on
Applied Sciences & Technology
9-12 January, 2012



CALL FOR PAPERS

AN INTRODUCTION

Despite the information revolution provided by communication, the most effective way of sharing scientific and technological knowledge and experiences is through symposia and conferences. In this modern era, there is a realization of synchronization with the fast-growing technologies as well as the identification of allied areas for the country needs. This led to the idea of holding a series of conferences, addressing the contemporary research areas what is known as the International Bhurban Conference on Applied Sciences and Technology (IBCAST). This effort was not only to promote the latest trends in the research and applications but also to make it accessible to those in need for industrial and economic growth of the country.

Starting from the year 2002, the IBCAST is being held consecutively for the past decade in the vicinity of Islamabad, the capital of Pakistan. Until the year 2005, four technological areas namely; Advanced Materials, Control Engineering, Computational Fluid Dynamics and Wireless Communication & Radar were covered. Afterwards, two more research areas - Underwater Acoustics and Medical Sciences were included. So far more than 5000 scientists and engineers have participated from Pakistani and foreign universities as well as scientific organizations with around 1200 research papers having been presented. The proceedings of the conference are published and catalogued in renowned international journals on yearly basis. So far 8 conferences have been successfully organized by the CESAT, Islamabad, which is a setup of Centers of Excellence on Science and Technology of the country with the research activities being in-line with the conference theme.

To enable the horizon of this conference to touch new heights, IBCAST has formed associations with universities from China, Hong Kong and Turkey. In the year 2010, IBCAST took place in collaboration with Nanjing University of Aeronautics and Astronautics, Nanjing and Northwestern Polytechnical University, Xi'an. This year more than 40 foreigners are expected to attend as a result of the achievements of the pervious conference.

This conference has successfully provided a platform for bringing together the researchers from the advanced and developing countries to discuss the research problems with reference to the development needs of this part of the world. Every year the IBCAST technical programme aims at appropriate selection of the topics both at the frontiers of knowledge and their applications.

IMPORTANT DATES

Abstract Submission (Deadline)	June 30th, 2011
Abstract Acceptance	July 31st, 2011
Paper Submission (Deadline)	September 15th, 2011
Paper Acceptance	October 15th, 2011
Participation Application (Deadline)	November 1st, 2011

ABSTRACT SUBMISSION

Authors are invited to submit extended abstracts of 250-500 words in English **Word Format**, including title, authors' affiliation, email and mailing address.

Abstracts may be submitted through **email on**
secretary@ibcast.org.pk,
info@ibcast.org.pk



The 9th IBCAST will consist of the following six activities:

1. Advanced Materials
2. Control & Signal Processing
3. Fluid Dynamics
4. Wireless Communication & Radar
5. Underwater Technologies
6. Medical Sciences

ACTIVITIES

1- Advanced Materials

The history of material science can be reviewed from its conception in Paleolithic period, through the emergence of metallurgy at the dusk of Neolithic period to the current age of polymeric composite materials. High strength and light weight remain the winning combination that has propelled composite materials into new arenas. From supersonic aircrafts to sport cars and from bullet trains to tennis racquets, composite materials are increasingly being used in engineering industries for their structures that are stronger than steel yet lighter than aluminum. Breakthroughs in synthesis of polymer chemistries have led to development of highly tailored application oriented materials. As polymeric composites with superior physical and mechanical properties are being developed, optimization of their processing techniques is eagerly being sought. Thus the scope of activities on advanced materials will focus on polymers, composites, nano composites and their peripheral fields with specific emphasis on their characteristics, synthesis, design, manufacturing, processing and testing.

A paradigm shift has been observed in materials sciences from traditional materials i.e. metallic, polymeric, ceramics and composites to a revolutionary role of developing nanostructured, multi functionalized, self-assembling and self-healing materials. These novel materials will create breakthroughs that will enable technology developments that are barely imaginable today. This is made possible by integration of composites with sensors, actuators and microprocessors on micro, meso and nano levels. Carbon fibers may be coated with piezoelectric materials for sensing purpose in order to synthesize a smart composite material having microprocessor controlled distributed actuator. This activity will also address processing, identification and characterization of nanomaterials with specific emphasis on their engineering applications.

As the structural complexity of various classes of materials increases, their coupling with coatings, ceramics and special alloys becomes more and more inextricably intertwined. The topics of special interest under the scope of subject activity also include 3D carbon-carbon composites, coatings, ceramics, surface and heat treatment processes of special alloys and related aspects in above mentioned fields.

2- Control & Signal Processing

Control engineering is the science of manipulating engineering systems for optimal performance in real-operating environments. Control engineers are concerned with mathematical modeling, simulation, design and implementation. The field is, therefore, multi-disciplinary and covers a range of technologies. Control systems are seen at work in small and simple household appliances, large-scale industrial plants such as steel rolling mills and refineries, very sophisticated and complex systems such as aircraft, nuclear reactors and satellites. Control systems technology has thus driven the engineers to operate their systems at the peak of their performance without compromising on system stability or integrity. Furthermore, new developments in simulation techniques have helped in the application of innovative control algorithms. The advent of cheap but high performance microprocessors has added a new dimension to the capability of control systems. Efficient digital controllers have alleviated the need for expensive instrumentation and costly components, contributing towards cheaper but quality products and performance.

The importance of Signal Processing in the engineering domain cannot be over emphasized. With new generation computer technology and configurable integrated circuits, powerful algorithms can be implemented in real time and used in various contemporary fields such as telecommunications, image, video and audio processing, sonars, biomedicine, seismology and computer vision.

In this conference; technical papers are sought on the latest developments in control and signal processing technologies. Papers of interest include those that describe theory, analytical techniques, applications, and technological developments. Topics expected to be covered in this activity are:

Control

- Control Theory Analysis and Design
- Intelligent & Autonomous Control
- Multi-sensor Data Fusion, Tracking and Control
- Autonomous and Unmanned Systems
- Aerospace Guidance and Control
- Mission Control and Operations
- Diagnostics and Fault-Tolerant Control Systems Design
- Simulation as an Engineering Design Tool
- Distributed Simulation Technologies
- Hardware in the Loop Simulation
- Launch and Orbital Systems and Simulation
- Artificial Intelligence Simulation Techniques and Applications
- Monte Carlo Simulation Techniques and Applications
- Self-Organizing Adaptive Simulations
- Unmanned Aerial Vehicle Systems
- Training and Motion Simulators

Signal Processing

- DSP Algorithms
- Image and Multi-dimensional (video) Signal Processing
- Pattern Recognition
- Computer/Machine Vision
- Neural Networks
- Process Monitoring
- Statistical Signal Processing
- DSP on Generic Reconfigurable Fabric (e.g. FPGAs)
- Efficient Implementation of DSP Algorithms on Embedded Systems
- ASIC Implementation of DSP Algorithms
- Real time Operating Systems issues regarding DSP Algorithms

3- Fluid Dynamics

Applications of fluid flow play an important role in nature, various man-made equipment, processes of aerospace, automotive, civil, defense, electrical engineering, power and process industries. Information about the structure of the flow in a process or an apparatus can be obtained from measurements in experimental test facilities or from flow visualization studies. However, there are some limitations and a full picture of flow fields is often hard to obtain in this fashion. Fluid Dynamics (FD) is a technique to model fluid flow using a computer simulation. Due to the growth of powerful computers and the development of general-purpose software packages, FD techniques can be applied to solve industrial flow problems especially in complex flow situations of aerodynamics and hydrodynamics. The FD codes include, among others, effects of heat and mass transfer and a range of physical and chemical models.

The 9th IBCAST will provide an opportunity to the local and foreign researchers to exchange their ideas, discuss their queries and problems in this specific field with the experts and to explore the new areas.

The scope of the present IBCAST, FD 2012, session is to cover the following areas:



- Fluid Structure Interactions
- Turbulence Modeling
- Aerodynamics
- Gas Dynamics
- Hydrodynamics
- Industrial and Environmental Fluid Dynamics
- Multiphase Flows
- Reactive Flows
- Experimental Fluid Dynamics
- Heat Transfer
- Thermal Hydraulics

4- Wireless Communication & Radar

Since formulation of mathematical equations of electromagnetic wave propagation by James Clerk Maxwell in 1873, development in engineering disciplines based on applied electromagnetics have transgressed beyond the imaginations of mankind. Both radar and communication systems transmit and receive electromagnetic energy to extract meaningful information. The technology advancement in these fields has resulted in a wide range of products from every day cell phone to high resolution synthetic aperture radar mounted on a satellite with a wireless terrestrial link. Radar and wireless communication systems can be segregated into three main domains: Antennas, RF/Microwave front-ends and baseband signal processing. The Radar and wireless communication chapter primarily focuses on all these technologies. The endeavours is to provide a platform to scientists and engineers involved in related work to share their original ideas and solutions, so that indigenous development in these fields can be pursued. Papers are invited for the areas related to (but not limited to) the following:

- Radar signal processing & performance measurement
- Clutter modelling & cancellation
- New trends in wireless networks
- Ultra wideband systems
- Reconfigurable front ends & systems
- Software defined radios
- Millimeter and microwave circuits and systems
- Field analysis and guided waves
- Waveguides & planar structures
- Phased array antennas
- Smart antennas
- MIMO antenna systems

Special session on SAR

Significant portion of research on radars in contemporary times is focused on Synthetic Aperture Radars (SAR). Owing to its versatile applications in military & civilian remote sensing from diversified aerial platforms, enhancement in SAR performance is being addressed in industry and academia. WCR activity has arranged a special session in 9th IBCSAT to promote original work representing new techniques in SAR hardware, improved algorithms & signal processing for SAR images and data links supporting SAR image processing.

5- Underwater Technologies

Ocean is alive with noise and approximately 71% of the earth surface is covered by the ocean. The advancement and research in underwater technologies has direct impact on human endeavour to explore the nature. The field of underwater technologies spans over a wide range which includes ocean vehicles, sonar systems, oceanography and has ever increasing role in defense applications. Research areas like marine life preservation, seafloor geological resources and marine pollution hazards etc are of significant importance for Pakistan which has more than 1000kms of coastline.

The Underwater Technologies chapter of IBCAST provides opportunities for spread of information, exchange of knowledge and novel ideas among the practitioners of various fields of underwater technologies.

The Underwater Technologies chapter of the 9th IBCAST 2012 invites contributions in;

Sonar Signal/Image Processing, Communication and Sensors.

- a. Array Signal Processing and Array Design
- b. Detection classification localization
- c. High Resolution Spectral Analysis
- d. Synthetic Aperture Sonar (Active and Passive)
- e. Sonar Imaging and Displays
- f. Acoustic telemetry and communication
- g. Transducer Arrays
- h. Transducer Materials

Ocean Vehicles

- a. Vehicle Design
- b. Vehicle Navigation and Positioning
- c. Unmanned Underwater Vehicles (UUVs)
- d. Remotely Operated Vehicles (ROVs)
- e. Naval Architecture

Underwater Acoustical Oceanography

- a. Sound Propagation and Scattering
- b. Channel Modeling
- c. Noise and Reverberations

Marine Science

- a. Marine Surveys
- b. Marine Renewable energy
- c. Marine Pollution
- d. Marine Geology and Mineral Resources

6- Medical Sciences

The evolution of Medicine is an on going process and a reflection, in the true sense, of the improvements in human reasoning and objectivity. From the reflex and intuitive efforts of a cave-man to conserve life in the face of physical injury and disease through Hippocrates, the father of modern medicine, to today in the era of great technologies, such rapid advances have occurred, especially in the last two to three decades that, it is difficult to keep pace with all of them.

An array of drugs to deal with infections (Penicillin, the only positive outcome from the 2nd World War) and other diseases, research in mental health issues, pill endoscopy in gastroenterology and organ transplants with increasing number of organs on the list, are a few of the mind boggling examples. Diagnostic services such as Computerized Axial Tomography Scan (CAT Scan) has itself made great strides with new technologies like 64-slice CT scan, FLAIR, Diffusion scanning and much more coming up rapidly. Meanwhile Ultrasound and Magnetic Resonance Imaging (MRI) technologies, DNA analysis and genetic testing, has given new dimensions and opened up horizons in Diagnostics as well as therapeutics.

Fruits of ongoing research and development such as artificial blood & artificial skin, have traveled from laboratory to market shelf and an array of artificial organs are in the pipeline of research. Most recent hot and controversial topic of today is stem cell research with many proponents and opponents, this field has the potential to fulfill the wildest of our dreams when it comes to rehabilitation of the handicapped. The main responsibility of the medical professionals in today's times is to keep abreast of all this knowledge and technology, and adopt evidence based medicine. For those in research it is imperative that they strike a balance between the science and the needs of the ailing humanity.



Exhibitors Information

The IBCAST offers the invited attendees to exhibit their organization's work on topics of high interest. Exhibitors may display accomplishments, products, projects, processes, and tools. They can market their wares to innovators, leaders and users from the diverse communities. Please visit IBCAST website (www.ibcast.org.pk) for further information.

Registration

Registration will take place on spot at National Centre for Physics, Islamabad
There is a registration fee for participation according to the categories mentioned below:

Registration Fee

S. No.	Category	Registration Fee
1.	Students	Rs. 1000/-
2.	Faculty/Professionals	Rs. 3000/-
3.	Research Organizations	Rs. 5000/-
4.	Foreigners	US \$ 300

Note: Application Form is available at: www.ibcast.org.pk

Venue: National Centre for Physics, Islamabad

Organized by: CENTRES OF EXCELLENCE IN SCIENCE AND APPLIED TECHNOLOGIES (CESAT), ISLAMABAD, PAKISTAN

In association with

Nanjing University of Aeronautics & Astronautics (NUAA), Nanjing (China)

Harbin Engineering University, Harbin (China)

Beihang University (BUAA), Beijing (China)

Dogus University, Istanbul (Turkey)

IBCAST SECRETARIAT:

Patron-in-Chief

Muhammad Irfan Burney, HI SI

Scientific Secretary

Dr. Arshad Munir, SI

Coordinator IBCAST

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www.ibcast.org.pk



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Application for Participation

PLEASE USE BLOCK LETTERS OR TYPE

Surname: Middle Name:

First Name:

Age Nationality:

Official Address:

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Phone: Fax:

Email Mobile:

Home Address:

.....

Preferred Mailing Address:

.....

Education (Masters Degree and Above):

Institution Attended	Period (years)	Degree Obtained
.....	.....to.....	.....
.....	.....to.....	.....
.....	.....to.....	.....

Title of Thesis:

M.Sc. /MS:

Ph.D:



Previous and Current Scientific and Academic Responsibilities:

Institution attended	Period (years)	Responsibility
.....	.....to.....	.....
.....	.....to.....	.....
.....	.....to.....	.....

9th IBCAST Activities of Interest :(Please indicate one activity only)

- | | |
|--|---|
| <input type="checkbox"/> Advanced Materials | <input type="checkbox"/> Wireless Communication & Radar |
| <input type="checkbox"/> Control & Signal Processing | <input type="checkbox"/> Underwater Technologies |
| <input type="checkbox"/> Fluid Dynamics | <input type="checkbox"/> Medical Sciences |

Title of Paper / Poster to be Presented [if any]:

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Please don't forget to enclose:

- Two Recent Photographs
- List of Publications During the Last Five Years
- **A summary of Work Done During the Last Five Years and Current Field of Interest. (Separate Sheet may be used)**

Venue: National Centre for Physics, Islamabad

**Organized by: CENTRES OF EXCELLENCE IN SCIENCE AND APPLIED TECHNOLOGIES (CESAT)
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Last Date of Application for Participation is 1st November, 2011.