



# Spectrum 2019

## 2nd International Students' Conference on 'Innovations in Science and Technology'

organized by

**Department of Basic Science and Humanities  
Institute of Engineering & Management, Kolkata**

in collaboration with

**The Institution of Engineers (India)**

on

7th – 9th March, 2019

at

IEM, Management House, Kolkata-91

### Programme Schedule

Day – 1 (07.03.2019)

9.00-10.00	<b>Registration and Welcome Kit distribution (1<sup>st</sup> Floor)</b>	
10:00 – 11:00	<b>Inauguration</b> Welcome address – Prof. Satyajit Chakrabarti, Director, IEM, Kolkata Speech by Prof. Amlan Kusum Nayak, Principal, IEM, Kolkata. Speech by Prof. Satyajit Chakrabarti, Chancellor, UEM, Kolkata. Inaugural Speech – Prof. Saikat Maitra, Vice-Chancellor, MAKAUT, WB. Keynote address -Prof. Sujoy Kumar Das Gupta, Director, Bose Institute. Motivation talk - Prof. Frederik G.Scholtz, Director, National Institute of Theoretical Physics, South Africa. Speech by Prof. S M Ali, Director (Membership) The Institution of Engineers (India). Speech by Prof. Sajal Das Gupta, VC, UEM, Kolkata. Speech by Prof. Arun Kumar Bar, Chair, Spectrum, 2019 Speech by Prof. Prabir Kumar Das, HOD, Dept. of BSH, IEM Conference brief up – Prof. Koyel Ganguly, Convener, Spectrum, 2019.  <b>Venue: CII Auditorium -1<sup>st</sup> Floor</b>	
11:00-11:15	<b>Tea Break</b>	
<b>Invited Talks (Venue : CII Auditorium -1<sup>st</sup> Floor)</b>		
<b>Time</b>	<b>Speaker</b>	<b>Topic</b>
11:15-12:15	<b>Dr. Indrani Bose</b>  <i>Emeritus Scientist, Department of Physics, Bose Institute, Kolkata</i>	Do bacteria play dice?
12:15 -1:00	<b>Sudhir Mallick</b>  <i>Director, INNOLEVER Solution Pvt.Ltd.</i>	Applications of Statistics in Business Analytics

	<i>Former principal consultant of TCS</i>	
<b>1:00- 2:00</b>	Lunch	
<b>2:00-3:00</b>	<b>Dr. Montserrat Rivas Ardisana</b> <i>Professor, Department of Physics, University of Oviedo</i>	Magnetic nano materials: What can they do for better health and safer food?
<b>3:00-4:00</b>	<b>Dr. Rajesh Kumble Nayak</b> <i>Associate Professor, Physical Sciences, IISER, Kolkata</i>	Gravitational Waves Astronomy
<b>4:00-5:00</b>	<b>Technical Poster Session</b>	

**Day – 2 (08.03.2019)**

<b>Invited Talks (Venue : CII Auditorium -1<sup>st</sup> Floor)</b>		
<b>Time</b>	<b>Speaker</b>	<b>Topic</b>
<b>9:30-10:30</b>	<b>Dr. Atul Gurtu</b> <i>Emeritus Professor, Kyung Hee University, South Korea &amp; Adjunct, Delhi University , (Formerly) Senior Professor, TIFR, Mumbai</i>	Celebrating Science & Technology: 2 Great Recent Discoveries: Gravitational Waves and the God Particle
<b>10:30-11:15</b>	<b>Dr. Xing Liu</b> <i>Department of Computer Science &amp; Information Technology, Kwantlen Polytechnic University, Canada</i>	An Overview of Blockchain and Internet of Things
<b>11:15-11:30</b>	Tea Break	
<b>11:30-1:00</b>	<b>Dr. Partha Majumdar</b> <i>Professor (retired), Department of Physics Ramakrishna Mission Vivekananda University Belur Math &amp; Sekhar Banerjee (Solar Electronics Specialist)</i>	<b>Workshop on Solar Electronics: Day 1</b> Direct applications of offgrid, low voltage solar electricity : a lecture-demonstration on non-toxic, eco-friendly prototypes
<b>1:00-2:00</b>	Lunch	
<b>2:00-3:00</b>	<b>Dr. Saket Saurabh</b> <i>Professor, Theoretical Computer Science Institute of Mathematical Sciences, Chennai</i>	The Limits of Computation and Beyond
<b>3:00-5:00</b>	<b>Oral Paper Presentation / Poster Session</b>	

**Day – 3 (09.03.2019)**

<b>Invited Talks (Venue : CII Auditorium -1<sup>st</sup> Floor)</b>		
<b>Time</b>	<b>Speaker</b>	<b>Topic</b>
<b>9:45-10:45</b>	<b>Dr.Ahmed Abdelgawad</b> <i>Associate Professor, Department Computer Engineering, College of Science and Engineering Central Michigan University</i>	Internet of Things (IoT) : From Sensors to Cloud
<b>10:45-11:00</b>	Tea Break	
<b>11:00-12:00</b>	<b>Dr. Houssain Kettani</b> <i>Professor, Computer Science ,The Beacom College of Computer and Cyber Sciences Dakota State University</i>	Advances in High Performance Computing and Their Impact on Innovations in Science and Technology
<b>12:00-1:30</b>	<b>Dr.Partha Majumdar &amp; Sekhar Banerjee</b>	<b>Workshop on Solar Electronics: Day 2</b>
<b>1:30-2:15</b>	Lunch	
<b>2:30-4:30</b>	<b>Oral Presentation / Quiz Session on Recent advances in Science and Technology</b>	
<b>4:30-5:00</b>	Valedictory Session	

**Details of Technical Sessions**

**Date: 07/03/2019 and 08/03/2019**

**Technical Session : Poster Session**

**Venue: 3<sup>rd</sup> Floor B.Tech Side (4:00-5:00 pm)**

**Judges: Prof. Rajesh Kumble Nayak, IISER, Kolkata**

*Prof. T.K.Datta, IEM, Kolkata*

*Prof. Arun Kumar Bar, IEM, Kolkata*

<b>Paper Id</b>	<b>Paper Title</b>	<b>Authors</b>
<b>8</b>	<b>Studies on the interactions in binary mixture of polyelectrolytes: Effect of the mixture composition and concentration on counterion-condensation</b>	Sudipa Santra and Bijan Das
<b>17</b>	<b>Paper on Evolution on Video Games</b>	Shakyadeep Bhattacharyya
<b>21</b>	<b>Producing renewable energy in an alternate way</b>	Saptarshi Neogi, Sayantan Pal and Kakoli Dutta
<b>23</b>	<b>Increasing Solar Cell Efficiency by using the concept of MEG in Quantum Dots</b>	Shubham Kumar and Kaustav Saha
<b>26</b>	<b>Application of Fluorescence Spectroscopy in the field of cancer treatment</b>	Saswata Saha and Kakoli Dutta
<b>29</b>	<b>Storing Electrical Energy from Lightning Strokes : A Source of Renewable Energy</b>	Soumyadip Sarkar
<b>33</b>	<b>Designing of Eco-friendly water-run car</b>	Shuvrakanti Choudhury and Nikesh Kumar
<b>34</b>	<b>Energy saving in street lights</b>	Saurav Kumar Agarwal and Shivam Kumar

37	<b>In-silico approach of determining the efficacy of Antibiofilm Activity of Bioactive Compounds from readily available natural herbs In Comparison with Standard Antibiotics against Streptococcus pyogenes biofilm forming proteins isolated from throat</b>	Dibyajit Lahiri, Sudipta Dash and Moupriya Nag
40	<b>Design of Electro-Mechanical Underwater Vehicle Engine: An Efficient No-fuel Consuming Substitute for Marine Diesel Engine</b>	Samarpan Deb Majumder
41	<b>A comparative study of chlorophyll content in some common beneficial plants</b>	Sudeshna Roy, Sonali Paul, Saikat Ghosh, Shrirupa Dhar and Susmita Mukherjee
59	<b>The Black Hole Paradox</b>	Subhranil Kundu, Swastika Das, Shubhangi Das and Mitadru Chakraborty
63	<b>High temperature superconductors: Possible applications and challenges</b>	Agnibha Ghosh, Prerana Misra and Soumyadipta Pal
73	<b>Wireless Power Transmission between Phones</b>	Prashant Harsh and Swarna Bhattacharya
75	<b>Overview on 5G Technologies</b>	Shafaq Nigar, Amir Khan and Md Nasir

**Date: 08/03/2019**

**Technical Session 1 : Oral presentation  
(Mathematics and Computer Science)**

**Venue: HR room, 4<sup>th</sup> floor MBA side (3:00-5:00pm)**

**Judges:** *Prof. Saket Saurabh, Institute of Mathematical Sciences, Chennai*  
*Prof. K. P. Ghatak, Senior Professor, IEM, Kolkata*  
*Nilanjan Sengupta, Director (Technical), IEI*

**Rapporteurs-** *Dr. Sanhita Paul*  
*Prof. Arijita Das*

<b>Paper Id</b>	<b>Paper Title</b>	<b>Authors</b>	<b>Time Slot</b>
35	<b>Computing the geodesics distance between two points in a polyhedral solid</b>	Debarshi Sarkar and Krishanu Deyasi	3:00-3:15 pm
38	<b>Performance Evaluation of Three Unsupervised Clustering Algorithms</b>	Rajdeep Baruri and Anannya Ghosh	3:15-3:30 pm
45	<b>Resolving the Protein-Folding Problem Using Clustering Partition and Random Walk Theory with Extended Applications in Alzheimer's Research Using Galton-Watson Processes and Stochastic Theory</b>	Dwaipayan Basu, Suvadip Sana and Kaustav Majumder	3:30-3:45 pm
55	<b>An user-friendly algorithm which shuffles music according to mood</b>	Soumalya Pakrashi and Sannoy Mitra	3:45-4:00 pm
58	<b>Design of Algorithms and their Analysis</b>	Ananya Mukherjee and Pratyayee Saha	4:00-4:15 pm
70	<b>The Formula <math>^{24}\text{Cr}</math> Revisited</b>	Soumendra Nath Banerjee	4:15-4:30 pm

71	Is Cryptocurrency Future Of Finance?	Aikya Maji, Surajit Saha, Sourav Majumder and Abhinav Srivastava	4:30-4:45 pm
72	Non static background modelling and subtraction using modified space and time local binary pattern technique	Kuldeep B. Vayadande1, Nikhil D. Karande and Surendra	4:45-5:00 pm

**Technical Session 2 : Oral presentation  
(Physics and Electronics)**

**Venue: Marketing room, 4<sup>th</sup> Floor MBA side (2:30 – 4:30 pm)**

**Judges:** *Prof. Atul Gurtu, Emeritus Professor, KHU, S. Korea*

*Dr. Partha Majumdar , Professor (retired),*

*Ramakrishna Mission Vivekananda University Belur Math*

**Rapporteurs-** *Dr. Tina De*

*Dr. Kakoli Dutta*

<b>Paper Id</b>	<b>Paper Title</b>	<b>Authors</b>	<b>Time Slot</b>
6	The Star in the Jar	Uttaran De and Ratul Sarkar	2:30-2:45 pm
9	The Physics Of Black Holes	Shubham Kumar, Arpita Bhattacharjee, Ankita Kumari, Priyanka Singh, Koyel Ganguly	2:45-3:00 pm
19	Effect of Gravity expressed as a Fluid Dynamic phenomenon on Space Curve	Balaka Biswas and Sunny Kumar	3:00-3:15 pm
32	A Study On Human Action Recognition in Surveillance Videos	Hemangee De, Aanisha Bhattacharyya, Rachna Agarwal and Sudeshna Roy Chowdhury	3:15-3:30 pm
44	Strange stars in f(R; T) gravity using Krori-Barua spacetime	Suparna Biswas, Shounak Ghosh, Bichitra Kumar Guha, Farook Rahaman and Saibal Ray	3:30-3:45 pm
60	Implementation of embedded predictive analysis system: Prevention of bridge wreckage	Sumalyo Datta, Sayanti Dutta, Ritwik Mukherjee, Nilanjana Bandyopadhyay, Susmita Basu and Sanhita Paul	3:45-4:00 pm
61	Quantum teleportation : a hypothetical concept	Raktim Datta, Surya Kanta Chatterjee, Ishan Banerjee, Debayan Bose, Sneha Dutta and Arnab Basu	4:00-4:15 pm
67	Helical molecule as an efficient thermoelectric element	Moumita Dey, Salma Farhana Aman and Santanu K. Maiti	4:15-4:30 pm

**Date: 09/03/2019**  
**Technical Session 3: Oral Presentation**  
**(Computer Science Engineering)**  
**Venue: HR room, 4<sup>th</sup> Floor MBA side (2:30-4:30 pm)**  
**Judges: Dr. Ahmed Abdelgawad, Central Michigan University**  
*Dr. Soumen Nandi, IEM, Kolkata*

**Rapporteurs- Prof. Triparna Datta**  
*Prof. Ayan Kr. Panja*

<b>Paper Id</b>	<b>Paper Title</b>	<b>Authors</b>	<b>Time</b>
<b>5</b>	<b>Virtual Reality in Military,Healthcare and Education:advantages and drawbacks</b>	Sayan Chaudhuri and Sumanta Kollya	2:30-2:45 pm
<b>14</b>	<b>Exploring the Anonymous Webs</b>	Hrithik Lall and Sreyashi Biswas	2:45-3:00 pm
<b>20</b>	<b>Artificial intelligence in Robotics Platform</b>	Swambhu Mullick, Swetsubhra Sarkar and Ayush Bhoumik	3:00-3:15 pm
<b>36</b>	<b>An overview on the future computers: quantum computers</b>	Moitrish Datta, Suman Das and Dibyasree Guha	3:15-3:30 pm
<b>48</b>	<b>Quantum Computing Device on Changing our Modern Society in different level</b>	Sanhita Koley, Aneesh Kar and Amartya Mukharjee	3:30-3:45 pm
<b>54</b>	<b>Military security using drone</b>	Anirban Dhar, Madhuti Saha, Soham Chaudhuri and Animesh Gupta	3:45-4:00 pm
<b>66</b>	<b>Image Processing Using Spintronics</b>	Abhijit Biswas and Soham Ghosh	4:00-4:15 pm
<b>77</b>	<b>Signal Processing: A Boon for Advancement</b>	Sreya Ghosh and Biswajit Saha	4:15-4:30 pm

**Technical Session 4: Oral Presentation  
(Electronics & Electrical)**

**Venue: Marketing room, 4<sup>th</sup> Floor MBA side (2:30-4:30 pm)**

**Judges:** *Prof. N.K.Kishore, IIT Kharagpur*

*Prof. Partha Majumdar , Professor (retired),*

*Ramakrishna Mission Vivekananda University Belur Math*

*Prof. Saswati Barman, IEM, Kolkata*

**Rapporteurs-** *Dr. Sanhita Paul*

*Prof. Dibyasree Guha*

<b>Paper Id</b>	<b>Paper Title</b>	<b>Authors</b>	<b>Time</b>
13	<b>Development of a Versatile Excreta Handling and Disposal Device</b>	Hanan Khaja Mohammad Irfan	2:30-2:45 pm
16	<b>Review on Hybrid Electrical Vehicle (HEV)</b>	Arkaprabha Lodh, Debopama Ghosh, Nibedita Maity, Debosama Ghosh, Sayan Acharya and Sutanaya Chatterjee	2:45-3:00 pm
27	<b>Features of EEG Signal Classifications for BCI Interface</b>	Aritra Mukherjee, Nirmalya Ganguli, and Pradyumna Bandyopadhyay	3:00-3:15 pm
62	<b>Graphene the pillar of valleytronics</b>	Suvsradip Ghosh, Devayan Bhattacharya, Manish Pandey and Ajoy Tibrewal	3:15-3:30 pm
65	<b>Charging of smart phone through self generated heat</b>	Arishmita Mukherjee, Audrish Mukherjee, Arvil Sen and Aritra Roy	3:30-3:45 pm
68	<b>Indoor Localisation Using Smartphone Sensor</b>	Ritwika Das, Tannistha Chakraborty and Avishek Ray	3:45-4:00 pm
74	<b>An attempt to transfer text through light</b>	Prashant Gaurav Raubins Kumar	4:00-4:15 pm
76	<b>Active layer thickness effect of photovoltaic device on a series of electrical parameters and device efficiency using simulation of gpydm software</b>	K. Chakraborty, S. Malakar, D. K. Mandal and R. Mondal	4:15-4:30 pm

**Technical Session 5: Oral Presentation  
(Renewable Energy and Mechanical Engineering)**

**Venue: System room, 4<sup>th</sup> Floor MBA side (2:30-4:30 pm)**

**Judges:** *P.K.Sen, Technical Committee Member, ISHRAE Institute of Excellence*

*Dr. Tapobrata Bhattacharjee, IEM, Kolkata*

*Dr. Ruchira Mukherjee, IEM, Kolkata*

**Rapporteurs-** *Dr. Tina De*

*Dr. Kakoli Dutta*

<b>Paper Id</b>	<b>Paper Title</b>	<b>Authors</b>	<b>Time</b>
15	A study of solar energy and ways to improve its economic viability and new business scopes	Prateek Majumder and Ruchira Mukharjee	2:30-2:45 pm
42	Thermo-hydraulic performance analysis of plain rectangular plate fin heat exchangers in laminar region -a numerical study	Anirban Bose, Chandra Shekhar and Md Adnan	2:45-3:00 pm
43	Thermo-hydraulic performance analysis of CNT-H <sub>2</sub> O nanofluid flow in turbulent region through rectangular plate fin heat exchangers -a numerical study	Anirban Bose, Anupal Banerjee and Utpal Maji	3:00-3:15 pm
46	A green solution to cold storage using magnetic refrigeration system	Satyaki Chatterjee and Amulayan Bhargow	3:15-3:30 pm
47	Solar energy based cooling system	Sayan Barat and Sagnik Das	3:30-3:45 pm
49	A New Approach for Improving the Quality and Quantity Production of Embedded Type Fin Tubes in Cooling Tower Industries	Dipanjan Dey	3:45-4:00 pm
53	Enhancing power using kinetic energy	Deepak Kumar and Tina Basu	4:00-4:15 pm
69	Harvesting energy from thunderstorm- a new source of renewable energy	Sayonnil Bhowmick, Sayantan Mukherjee and Ruchira Mukherjee	4:15-4:30 pm
78	Solar Energy driven high-yield low cost sea water desalination for drinking water production	Sayak Bhattacharjee, Rohan Pandit and Biswajit Saha	4:30-4:45 pm