



## IEMPHYS-19

International Conference  
on  
'Condensed Matter Physics'  
organized by

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

in collaboration with

**IEM - Society of Physics Students Chapter (AIP)**

Date: 14<sup>th</sup> – 16<sup>th</sup> November, 2019

Venue: Management House, 1<sup>st</sup> floor  
Institute of Engineering & Management, Kolkata, India  
Day-1(14.11.2019)

**Time: 09.00 -10.00 a.m**

**Registration and Welcome Kit distribution**

**Inauguration Programme Schedule**

**Time: 10.00a.m -10.45 a.m**

**Venue: CII auditorium, Management House, IEM**

**Programme host: Prof. Sanghamitra Poddar**

Welcome address by <b>Prof.A. K. Nayak</b>	<i>Principal, IEM</i>
Keynote address by <b>Prof. K. P. Ghatak</b>	<i>Research Director IEM</i>
Inaugural speech by <b>Prof. B. K. Chakrabarti</b>	<i>Emeritus Professor ,(Former Professor &amp; Director) Saha Institute of Nuclear Physics, Kolkata</i>
Speech by <b>Prof. Anjan Barman</b>	<i>Senior Professor &amp; Associate Dean(Faculty) S N Bose Centre, Kolkata</i>
Motivational talk by <b>Prof. S. M. Yusuf</b>	<i>Outstanding Scientist, Head Solid State Physics Division, Bhabha Atomic Research Centre, Mumbai</i>
Speech by <b>Prof. Tapati Datta,</b>	<i>Dean of Science, St. Xavier's College, Kolkata</i>
Conference statistics by <b>Prof. KoyelGanguly</b>	<i>Convener, IEMPHYS-19</i>
Vote of thanks by <b>Prof. Prabir Kumar Das</b>	<i>Chair , IEMPHYS-19</i>
<b>Time: 10.45-11.00a.m</b>	<b>Teabreak</b>

<b>Keynote Talk</b> <i>Session Chair: Dr. Tapati Dutta,  Dean of Science, St.Xavier's College, Kolkata</i>			
<b>Time</b>	<b>Speaker</b>	<b>Affiliation</b>	
<b>11:00-11:45</b>	<b>Dr. S. M. Yusuf</b>	<i>Outstanding Scientist,  Head Solid State Physics Division,  Bhabha Atomic Research Centre</i>	
<b>Plenary Talk</b> <i>Session Chair: Dr. Tapati Dutta,  Dean of Science, St.Xavier's College, Kolkata</i>			
<b>11:45 -12:30</b>	<b>Dr. Anjan Barman</b>	<i>Senior Professor,  S N Bose Centre, Kolkata</i>	
<b>12:30- 1:30</b>	Lunch		
<b>Technical Session 1(Computational Condensed Matter Physics)</b> <i>Session Chair: Dr. Saswati Barman,  Senior Professor, IEM, Kolkata</i>			
<b>1:30-2:15</b>	<b>Dr. Sudipta Kanungo</b>	<i>Assistant Professor,  IIT Goa</i>	
<b>2:15-3:45</b>	<b>Poster Session 1</b> <b>P C Roy Hall</b> <i>Session Chair:Dr. Sudipta Kanungo, Assistant Professor, IIT Goa  Dr. Biswajit Saha, Assistant Professor, UEM Kolkata</i>		
	<b>Paper ID</b>	<b>Title of the Paper</b>	<b>Author(s)</b>
	E-1	Tunable magnetic properties of Cu doped cobalt ferrite nanoparticles	Mritunjoy Prasad Ghosh, Samrat Mukherjee
	E -6	Half metallic ferromagnetic and optical properties of Ruthenium-doped Zincblende ZnS: A first principles study	Supriya Ghosal, HomnathLuitel, Sujoy K. Mandal, DirthaSanyal and Debnarayan Jana
	E-11	Studies of forbidden frequency band using one dimensional mass chain model with different combination of meta-materials	Priyanka Betal, Chayan K. Karmakar, Sampad Mukherjee
	E-12	Ultrasonic study on the effect on forbidden band introducing transition metal ion in colloidal liquid	Chayan K. Karmakar, Priyanka Betal, Sampad Mukherjee
E-18	Study of structural phase transition of multiferroic $Cu_2V_2O_7$ by non-magnetic Zn/Mg and magnetic Co Doping at the Cu site	AbjaKeshar Kar, Bidisa Chattopadhyay and S. Bandyopadhyay	

	E-19	Study of Antiferromagnetic-Ferromagnetic transition in $\text{FeRh}_{0.46}\text{Pd}_{0.54}$ using resistivity relaxation measurements	PampiSaha, and R. Rawat
	E-20	Quantum Floquet Systems	Aayushi Agrawal and Jayendra Nath Bandopadhyay
	E-22	Study on the Effect of Zinc Oxide Nanoparticles on Injection Barrier Height of Crystal Violet Dye Based Organic Device	Sudipta Sen, Nabin Baran Manik
	E-23	Morphologically Tuned of BiOCl nano-crystals by PVP variation for visible light assisted dye degradation	Ratna Sarkar, Dimitra Das, Subrata Sarkar and Kalyan Kumar Chattopadhyay
	E-26	Dielectric and Impedance spectroscopy study of $\text{Ba}_{0.5}\text{Sr}_{1.5}\text{FeVO}_6$	Sourav Bhattacharjee and Bichitra Nandan Parida
	E-29	Antiferromagnetism in two-orbital model for $s_{\pm}$ -wave iron based superconductors	P. K. Parid, B. Pradhan, S. Sahoo
<b>3:45-4:00</b>	<b>Tea</b>		
<b>4:00-6:00</b>	<b>City Tour (Delegates &amp; External Participants)</b>		

**Day – 2 (15.11.2019)**

<b>Technical Session 2 (Quantum Computation and 2D Materials)</b> <i>Session Chair: Dr. Kamakhya Prasad Ghatak</i> <i>Research Professor, IEM Kolkata</i>		
<b>Time</b>	<b>Speaker</b>	<b>Affiliation</b>
<b>9:30-10:15</b>	<b>Dr. Steven Girvin</b>	<i>Eugene Higgins Professor of Physics, Yale University</i>
<b>10:15-11:00</b>	<b>Dr. Amrita Bhattacharya</b>	<i>Assistant Professor, IIT Bombay</i>
<b>11:00-11:15</b>	Tea Break & Photo Session	
<b>Plenary Talk and Invited Talk</b> <i>Session Chair: Dr. Sudipta Kanungo</i> <i>Assistant Professor, IIT Goa</i>		
<b>11:15-12:00</b>	<b>Dr. KalobaranMaiti</b>	<i>Dean, Natural Science Faculty Tata Institute of Fundamental Research</i>
<b>12:00-12:45</b>	<b>Dr. ArijitSaha</b>	<i>Reader F IOP Bhubaneswar</i>
<b>12:45-1:30</b>	Lunch	

<b>Technical Session 3 (Material Science)</b> <i>Session Chair: Dr. Arun Kumar Bar</i> <i>Dean of Engineering, IEM Kolkata</i>			
<b>1:30-2:15</b>	<b>Dr. Chandan Mazumder</b>	<i>Professor, SINP, Kolkata</i>	
<b>2:15-3:00</b>	<b>Dr. Kalyan Kumar Chattopadhyay</b>	<i>Professor, Jadavpur University, Kolkata</i>	
<b>3:00-3:15</b> <b>Tea Break</b>			
<b>Technical Session 4 (Plasma Physics)</b> <i>Session Chair: Dr. Amrita Bhattacharya, Assistant Professor, IIT Bombay</i>			
<b>3:15-4:15</b>	<b>Dr. Leo Mendel D. Rosario</b>	<i>Deputy Director Office of Research and Development and Extension FEATI University</i>	
<b>Contributed Sessions</b>			
<b>Oral Session 1 (Magnetism and Spintronics)</b> <b>S N Bose Hall</b> <i>Session Chair: Dr. Sudipta Kanungo, Assistant Professor, IIT Goa</i> <i>Dr. Sanhita Paul, Assistant Professor, IEM Kolkata</i>			
<b>4:30-6:00</b>	<b>Paper ID</b>	<b>Title of the Paper</b>	<b>Author(s)</b>
	E-7	Study of post annealing effects on structural, magnetic and magneto-optical properties of MnAl thin films	H. Khanduri, Mukesh C. Dimri, Prashant Kumar, S. Chaudhary and R. P. Pant
	E-28	Coexistence of superconductivity and antiferromagnetism in bi-layer cuprate superconductors	Brundabana Pradhan
	E-31	Spin Hall Conductance in a two-dimensional tight-binding model in the presence of Rashba spin-orbit interaction and random impurities	Hemant Kumar Sharma, Ashok Chatterjee and Shreekantha Sil
	E-37	Structural and Magnetic properties of Room Temperature Multiferroic $\text{Lu}_{0.9}\text{Ho}_{0.1}\text{FeO}_3$	Leelashree S, P.D. Babu, S. Srinath, S.N. Kaul
	E-59	Efficacy of annealed alumina thin films in ion beam dosimetry	Saptarshi Pal, Sangita Bhowmick, Saif A Khan and Aloke Kanjilal
	E-61	Magnetic Anisotropy and Tunable Magnetotransport in $\text{Si/La}_{0.7}\text{Sr}_{0.3}\text{MnO}_3/\text{ZnO}$ Heterostructures	Bibekananda Das and Prahallad Padhan

**Oral Session 2 (Engineering, Smart Materials, Devices, Graphene and other 2D Materials)**

**C V Raman Hall**

*Session Chair: Dr. Arijit Saha, Assistant Professor, IOP Bhubaneswar*

*Dr. Koyel Ganguly, Associate Professor, IEM Kolkata*

<b>Paper ID</b>	<b>Title of the Paper</b>	<b>Author(s)</b>
E-8	Temperature dependence on the transport properties of a single-molecular transistor	Manasa Kalla, Ashok Chatterjee
E-9	Room temperature electroclinic liquid crystal mixture with large induced tilt angles	Asim Debnath and Pradip Kumar Mandal
E-24	Long-range Graphene Surface Plasmon Polariton induced Tunable Optical Bistability in Terahertz Range	Aparupa Kar, Nabamita Goswami and Ardhendu Saha
E-49	Optical polarizing microscopy and electrical response time of three ferro-electric liquid crystals having biphenyl benzoate core	Debarghya Goswami, Asim Debnath and Pradip Kumar Mandal
E-54	Toxic gas adsorption on doped phosphorene: A density functional approach	Gaganpreet
E-60	Molecular dynamics simulations to see the effect of temperature and pressure change on the dynamics of protein	Osheen Yadav and Sunita Negi
E-76	A Novel Alumina-Magnesium oxide-Reduced Graphene Composite Composite: Synthesis and Characterizations	Binod Bihari Palei, Tapan Dash, Susanta Kumar Biswa

**Poster Session 2**

**P C Roy Hall**

*Session Chair: Dr. Amrita Bhattacharya, Assistant Professor, IIT Bombay*

*Dr. Leo Mendel D. Rosario, Deputy Director, FEATI University*

<b>Paper ID</b>	<b>Title of the Paper</b>	<b>Author(s)</b>
E-16	Enhance optical properties of manganese sulphide nanoparticles capped with starch	Bharati Debi Biswas and Tapas Pal Majumder
E-32	Photocatalytic Degradation of Toxic Methyl Orange Dye Using Sacrificial Cellulose Templated Zirconium Oxide (ZrO <sub>2</sub> ) nanoparticles	Arpan Kool, Rajeswar Panja, Aniket De, and Manav Goenka
E-33	Optical and Dielectric Properties of Flexible Rhodamine B Dye/ PVA Composites	Debopriyo Ghoshal, Debopriya Bhattacharya, Dheeraj Mondal, Sukhen Das, Navonil Bose, Mousumi Basu
E-34	Enhanced Dielectric and Optical Properties of CCoTO Ceramic/PVA Composites	Debopriya Bhattacharya, Debopriyo Ghoshal,

			Dheeraj Mondal, BiplabK Paul, Sukhen Das, MousumiBasu
	E-39	Melting Colloidal Monolayers with Graphene-like Honeycomb Symmetry	Ankush Sengupta, Sayak Chakraborty and Kaustuv Das
	E-40	Design and fabrication of Ag@rGO nanostructures: Wide Spectral range Photocatalyst	Dr. Kajari Dutta, Agnibho Datta and Dr. Sukanta De
	E-45	Effect of preparation condition on the crystal and electronic structure of $\text{La}_{0.2}\text{Sr}_{0.8}\text{MnO}_3$	Priyamedha Sharma, Jaskirat Brar, Bharath M, R. K. Maurya, R. Rawat and R. Bindu
	E-50	Influence of the $\text{C}_3\text{N}_4$ Conducting Network inside the Composite Network of Ni-Zn-Cu-Ferrite-Poly(vinylidene fluoride) Films for the Improvement of the EMI Shielding Effectiveness	SoumyadityaSutradhar, Tanmoy Chakraborty, Shivam Sharma
	E-51	Magnetic, Dielectric and Magneto-Capacitance Response Study of Highly Flexible, Laminated Composite Structures of NZCF-PVDF Films: A New Approach towards Multiphase Multiferroic Response	SoumyadityaSutradhar, SomashreeBhowmick
	E-52	Large EMI Shielding Effectiveness of Highly Flexible Ferrite-Poly(vinylidene fluoride) Composite Films: Useful material for the Reduction of Electromagnetic Pollution	SoumyadityaSutradhar, Priyanka Chakraborty, Sagnika Sen
	E-57	Low temperature processed $\text{Co}_2\text{GeO}_4@\text{ZnO}$ core shell for electron field emission	Kausik Sardar, Subhasish Thakur, NripenBesra, SoumenMaiti, Gautam Majumdar and Kalyan Kumar Chattopadhyay
	E-77	Origin and tuning of room-temperature multiferroicity in Fe-doped $\text{BaTiO}_3$	Pratap Pal, KrishnaRudrapal, SudiptaMahana, Satish Yadav, Kiran Singh, Dinesh Topwal, Ayan Roy Chaudhuri and Debraj Choudhury
<b>6:30-7:00</b>	<b>Cultural Program</b>		
<b>7:00-9:00</b>	<b>Conference Dinner</b>		

**Day – 3 (16.11.2019)**

<b>Invited talk and Workshop on “Structural Analysis : X- Ray diffraction and Rietveld refinement”</b>		
<b>Time</b>	<b>Speaker</b>	<b>Affiliation</b>
<b>9:30-11:00</b>	<b>Dr. Sanjay Singh</b>	<i>Assistant Professor (IIT BHU)</i>
<b>11:00-11:15</b>	Tea Break	
<b>Technical Session 5 (Plasma Physics &amp; DFT)</b> <i>Session Chair: Dr. Subhankar Ghosh</i> <i>Associate Professor, St.Xavier’s College, Kolkata</i>		
<b>11:15-12:00</b>	<b>Dr. SudiptaBandyopadhyaya</b>	<i>Assosciate Professor, University of Calcutta</i>
<b>12:00-12:45</b>	<b>Dr. Prasenjit Sen</b>	<i>Professor H Harish-Chandra Research Institute</i>
<b>12:45-1.30</b>	<b>Dr. Debnarayan Jana</b>	<i>Professor University of Calcutta</i>
<b>1.30-2:30</b>	<b>Lunch</b>	
<b>2:30-4:00</b>	<b>Contributed Sessions</b>	
<b>Oral Session 3 (Nano-materials and nano-technology)</b> <b>S N Bose Hall</b> <i>Session Chair:Dr. Sudipta Bandyopadhyay, Associate Professor, University of Calcutta</i> <i>Dr. Soumyadipta Pal, Assistant Professor, IEM Kolkata</i>		
<b>Paper ID</b>	<b>Title of the Paper</b>	<b>Author(s)</b>
E-13	Magnetic studies of spinel ferrite nanoparticles	Mukesh C. Dimri, P. Agarwal, V. Garg and H. Khanduri
E-14	Spectroscopic characterization and photo catalytic degradation ability of ternary oxides of Cobalt	Moushumi Dutta Purkayastha, ParthaPratim Ray, Tapas Pal Majumder, Mitali Sarkar
E-35	Glass transition temperature a tool to optimise the proportional constituents of two Titanium based tri-component Thin film metallic glasses (TFMG)	Haimanti Chakrabarti, Dipanwita Dutta, Shruti De and BaishaliKanjilal
E-55	Application of Mass Spectrometry in biomedical and pharmaceutical field	Girish Garg, Shubho Das and C Lisa
E-67	Synthesis and Structural Characterization of ZnO-Graphene Nanocomposite by Chemical Co-Precipitation Method	Ayana Bhaduri and Pinky Yadav
E-79	Memory Effect & Growth of Glassy Magnetic Phase in Nanocrystalline	SuvayanSaha, Sudipta Bandyopadhyay and

	La <sub>0.4</sub> (Ca <sub>0.5</sub> Sr <sub>0.5</sub> ) <sub>0.6</sub> MnO <sub>3</sub> Compound	Indranil Das
<b>Oral Session 4 (Dielectrics, Semiconductors and Computational Materials)</b> <b>C V Raman Hall</b> <i>Session Chair: Dr. Debnarayan Jana, Professor, University of Calcutta</i> <i>Dr. Saswati Barman, Research Professor, IEM Kolkata</i>		
<b>Paper ID</b>	<b>Title of the Paper</b>	<b>Author(s)</b>
E-21	Metal-chalcogen bond-length induced electronic phase transition from semiconductor to topological semimetal in ZrX <sub>2</sub> (X = Se and Te)	Indrani Kar, Joydeep Chatterjee, Luminita Harnagea, Y. Kushnirenko, A. V. Fedorov, Deepika Shrivastav, B. Büchner, P. Mahadevan, and S. Thirupathiah
E-25	Comparative study of electronic, optical and vibrational properties of 5-Aminotetrazoles based alkali salts: A DFT study	G. S. Vaitheeswaran, JharaplaPrathap Kumar, and Subrata Mondal
E-36	High Temperature Dielectric Response and AC Conductivity Mechanism of (Nd, Ni) codoped BiFeO <sub>3</sub>	MehrooshFatema, Shahid Husaina, Samiya Manzoor, Anand Somvanshi, Naima Zarrin and ArefAlqahtani
E-68	Estimation of trap energy of fuchsin dye sensitized Organic Photovoltaic Device based on Titanium Dioxide (TiO <sub>2</sub> )	Dipankar Sahoo and Nabin Baran Manik
E-90	Power and delay analysis of energy recovery SRAM:ERSRAM	SamikSamanta, Rajat Mahapatra, and Ashish Kumar Mal
E-91	Magnetic Field Dependence of Heat Capacity in Single Crystal BaKFe <sub>2</sub> As <sub>2</sub> Superconductor	G. Purohit, A. Pattanaik, P. Nayak
<b>Poster Session 3</b> <b>P C Roy Hall</b> <i>Session Chair: Dr. Leo Mendel D. Rosario, Deputy Director, FEATI University</i> <i>Dr. Sanjay Singh, Assistant Professor, IEM Kolkata</i>		
<b>Paper ID</b>	<b>Title of the Paper</b>	<b>Author(s)</b>
E-27	Energy dissipation minimization (Superconducting circuits)	Abhirup Dutta, Ankan Pal, Saptarshi Das and Jyotirmay Kar
E-47	Wide Bandgap Power Semiconductor Devices	Dev Sarkar, Kuntal Paul, Shreya Dutta and IndranilHazra
	Review OnImpatt/Trapatt And Gunn Diode And	Soumiki Chattopadhyay,



	E-58	Their Application On Missile Technology	Samadrita Pal, Prita Biswas, SourodeepBhattacharyya and Aditya Poddar
	E-78	Double perovskites: A potential functional material of 21st century	Tapasree Dey, Shreya Basu, TithiSreemany, Tiyasha Nag, S. Pal
	E-80	A concept of nano solar cells application	Saptarshi Mondal, Moulik Paul and Rahul Nandy
	E-81	Zinc Oxide: Antimicrobial Activity	Ishita Nag, Zunaid Hussain, Yash Daga, Srijani Ghosh and Soumyadipta Pal
	E-82	Graphene as an electrode	Soham Maitra, Souvik Sen, RounakGanguly, TotanHazra and Abhijit Kar Gupta
	E-83	VANTABLACK –a new face of Carbon	Arnab Basu, Ujan Chaudhuri, Surya Sekhar Datta, Sagnik Chowdhury, Supratim Kumar Dey and Hindol Sen
	E-84	Fermi Dirac distribution: An effective alternative model	Arnab Basu, Anurag Pandey, Tushar Agarwal, Saurav Anand, Urmilesh Kumar, Vinay Kumar Sinha and Vikash Kumar
	E-85	Magnetic Skyrmions-A Revolution In Electronics	Riddhi Sarkar, Saikat Chandra and Sayak Banerjee
	E-86	MoS <sub>2</sub> based nanocomposite an alternative approach in biosensor	Sugata Dutta, RomitBhaumik, Samya Bose, Shovik Poddar, Snehanco Ghosh and Triparna Datta
	E-87	Types of Hall Effect Sensors and their applications—A critical review	Prasakha Mahapatra, Sohini Chatterjee, ParichitaSaha and Aindrila Das
	E-88	Effects Of Displacement Damage In Silicon	Dattatreya Banerjee, Rishav Tewari, Manosij

		Devices	Chowdhury and Aritra Pal
	E-89	Superconductivity: Its Recent Progresses & Superconductive Devices; Cooper Pairing	Subhadip Roy, Tapabrata Bhattacharyya, Souradeep Paul, Swapnamoy Das, Soumyaditya Sinha and Swagata Pal
<b>4:15-4:45</b>	<b>Valedictory Session</b>		