






**ESMOC 2013**  
**Energy System Modeling and Optimization Conference**  
 December 9-11, 2013, NIT Durgapur, India



*Sponsors:*  
**DST-SERB, DAE-BRNS, CSIR, NIT Durgapur**  
**Conference Presentation**


<b>December 9, 2013</b>				
Registration (8:30-17:00): Chemical Engineering (ChE) Dept. / D. M. Sen Memorial (DMSM) Hall				
<b>Welcome Session (9:00-9:40): DMSM Hall</b> Speakers: <b>Biswjit Halder</b> , NIT Durgapur, India <b>Pradip Saha</b> , GE-Hitachi Nuclear Energy, USA <b>Tarkeshwar Kumar</b> , NIT Durgapur, India <b>Swapan K. Mitra</b> , NIT Durgapur, India <b>Rajiv K Tayal</b> , DST, New Delhi, India <b>P. K. Vijayan</b> , BARC, India				
<b>Plenary Talk (9:40-10:20): DMSM Hall</b>				
1	40min	CFD based approach for harnessing and conservation of Energy	 <b>Aniruddha B. Pandit</b> <dr.pandit@gmail.com>	Institute of Chemical Technology, India
High Tea (10:20-10:40)				
<b>TRACK-1: Petroleum Exploration &amp; Production</b> Track Co-Chairs: Tarkeshwar Kumar, NIT Durgapur, India & Ashok Varma, ONGC, India Session Chairs: <b>Tarkeshwar Kumar</b> Coordinator: <b>Gopinath Halder</b> <gopinath_haldar@yahoo.co.in>, NIT Durgapur Venue: DMSH Hall Time: 10:40-12:40				
2	25min	<b>Keynote Talk</b> - Flow Assurance in Oil and Gas Industries: Present Status and Future Opportunities	 <b>G. P. Karmakar</b> <gpkarmakar@gmail.com>	Pandit Deendayal Petroleum University, India
3	15min	Effect of Magnetic Field on Viscosity of Diesel as a Component of Crude Oil	<b>Vinod Mhaske</b> , Anand D.Kulkarni <anand.kulkarni@mitpune.edu.in>, Somnath Nandi	MIT Pune, India




6	15min	Performance Analysis of Sucker Rod Pump through Counterbalancing	<b>Dheeraj Pratap</b> <dheerajpratap123@gmail.com>, Somnath Nandi, Pradeep B. Jadhav	MIT Pune, India
<p><b>TRACK-2: Petroleum Refining and Petrochemicals</b>  Track Co-Chairs: Sobhan Ghosh, Managing Innovation, India &amp; Ali Almansoori, The Petroleum Institute, UAE  Session Chairs: <b>Shobhan Ghosh</b> and <b>P. Ray</b>, University of Calcutta  Coordinators: <b>Mrinal K. Mandal</b> &lt;mrinalmandal@gmail.com&gt;, NIT Durgapur  Venue: Seminar Room-1, ChE Dept.  Time: 10:40-12:40</p>				
7	25min	<b>Keynote Talk</b> - Design of Sonication Flow Reactor and Scale-Up Issues	 <b>Sobhan Ghosh</b> <ghoshsobhan@yahoo.com>	Managing Innovation, India
8	15min	Multigrain catalyst model for active matrix-zeolite FCC catalysts: modeling of riser reactor in resid cracking	Pushkar Varshney, <b>Santosh K. Gupta</b> <skgupta@ddn.upes.ac.in>, Deepak Kunzru	IOCL, University of Petroleum & Energy Studies, Dehradun, India, IIT Kanpur
10	15min	Simulation of an Industrial FCC Riser Reactor using Novel 10- Lump Kinetic Model	<b>Prabha K. Dasila</b> <dasila.prabha@gmail.com>, I.R.Choudhury, S. Singh, S . Rajagopal, S.J. Chopra, D.N. Saraf	University of Petroleum & Energy Studies, India, IOCL
11	15min	Resilience Analysis of a System: Absorption Column System used in Sweetening of Sour Natural Gas	<b>Sirshendu Guha</b> <sguha1968@yahoo.com> and Sudip Kumar Das	University of Calcutta
<p><b>TRACK-3: Thermal Science &amp; Engineering</b>  Track Co-Chairs: Sujoy K Saha, BESU, India and Depankar Chatterjee, CSIR-CMERI, India  Session Chairs: <b>Depankar Chatterjee</b>  Venue: Seminar Room-2, ChE Dept.  Time: 10:40-12:40</p>				
13	25min	<b>Keynote Talk</b> - Control of Boundary Layer Separation around Bluff Obstacles	 <b>Dipankar Chatterjee</b> <d_chatterjee@cmeri.res.in>	CSIR-Central Mechanical Research Institute, India
14	15min	Thermodynamic Analysis of a 500 Mw Coal Fired Thermal Power Plant In India	<b>Goutam Khankari, Mrinal Biswas</b> , Achintya Pramanick, Sujit Karmakar <sujitkarmakar@yahoo.com>	DVC, NIT Durgapur

15	15min	First law analysis of tea drying furnace in Cut-Tear-Curl (CTC) tea manufacturing-A case study	<b>Abhijit Sinha</b> <abhinit05@gmail.com>, Rajat Gupta, K.M. Pandey, S.K. Dey	NIT Silchar, NIT Srinagar,
16	15min	Impedance based flow structure recognition in a natural circulation boiling loop	<b>Arnab Karmakar</b> <arnab.ngt@gmail.com>, Swapan Paruya	NIT Durgapur
17	15min	Heat transfer enhancement by additives in Plate heat exchanger	Dheeraj Kumar, <b>P. Kalaichelvi</b> <kalai@nitt.edu>, K. Muthamizhi, T. K. Radhakrishnan	NIT Trichy
<p><b>TRACK-5: Renewable Energy</b>  Track Co-Chairs: Bibek Bandyopadhyay, MNRE, GOI, India and I. M. Meshra, IIT Roorkee, India  Session Chairs: Bibek Bandyopadhyay and Tamal Mandal, NIT Durgapur  Coordinator: <b>Susmita Dutta</b>, NIT Durgapur  Venue: Seminar Room-3, ChE Dept.  Time: 10:40-12:40</p>				
18	25min	<b>Keynote Talk</b> - Mainstreaming Renewables	 <b>Bibek Bandopadhyay</b> <bbibek@nic.in>	MNRE, Govt. of India
19	15min	Prediction of optimal conditions in methanolysis of mustard oil for biodiesel production using cost-effective Mg-solid catalyst	<b>P. Pradhan</b> , S. Das, P. Mukhopadhyay and R. Chakraborty <rajat_chakraborty25@yahoo.com>	JU and HIT Kolkata
20	15min	Biodiesel Production From Three Cyanobacterial Strains	A. Swati, S. G. Thakurta, R. Mondal, S. Dutta and <b>J. Chakraborty</b> <jito19@gmail.com>	NIT Durgapur
21	15min	Kinetics of Homogeneous and Heterogeneous Cracking of Wood Pyrolysis Tars under Conditions Approximated To Gasification and Combustion	<b>Ashish S. Chaurasia</b> <aschaurasia@che.vnit.ac.in>	VNIT Nagpur
22	15min	Application of Response Surface Methodology for Optimization of Removal of Chromium (VI) using Microalgae and Extraction of Lipid for Biodiesel Production	<b>Susmita Dutta</b> <susmita_che@yahoo.com>, Deepika Khuswaha, Suman Saha and Srabanti Basu	NIT Durgapur, HIT Kolkata
23	15min	Mathematical Modeling of a semi-batch pyrolyser for Sesame oil cake	<b>A. Sarkar</b> , B. Mondal, R. Chowdhury <ranjana.juchem@gmail.com>	Jadavpur University, India
24	15min	Experimental Analysis Of A 10° Helical Savonius Rotor At Different Overlap Conditions	<b>Bachu Deb</b> <bachudeb@gmail.com>, Rajat Gupta and R.D. Misra	NIT Silchar, NIT Srinagar
Lunch (12:40-13:20)				
<b>Plenary Talks</b> (13:20 – 14:30): DMSM Hall				

26	40min	Enhanced Oil Recovery - A Future Solution for Mitigating the Oil Crisis	 <b>Tarkeshwar Kumar</b> <director@admin.nitdgp.ac.in> <tkumar2002@yahoo.com>	NIT Durgapur, India
27	30min	Holistic Approach to Technology Acquisition	 <b>Rajiv K. Tayal</b> , Advisor<tayal@nic.in>	DST, Govt. of India
Tea Break (14:30-14:40)				
<b>TRACK-1: Petroleum Exploration &amp; Production</b> Track Co-Chairs: Tarkeshwar Kumar, NIT Durgapur, India & Ashok Varma, ONGC, India Session Chairs: <b>Tarkeshwar Kumar</b> Coordinator: <b>Gopinath Halder</b> <gopinath_haldar@yahoo.co.in>, NIT Durgapur Venue:DMSM Hall Time: 14:40-16:40				
28	15min	Modeling of Surfactant Flooding for Enhanced Oil Recovery Using Stars	<b>Achinta Bera</b> <achintachm@gmail.com>, Ajay Mandal, T. Kumar	ISM Dhanbad
29	15min	Viscoelastic Surfactant based fluid-A new generation hydraulic fracturing fluid	<b>A. Baruah</b> <atrayee_103@yahoo.co.in>, K. Ojha and A.K. Pathak	ISM Dhanbad
31	15min	Reservoir Simulation of Permeability Changes in Stimulated Shale Reservoirs	<b>Samarth D. Patwardhan</b> <samarthpatwardhan@gmail.com>, G. Suresh Kumar	IIT – Madras, Chennai, India
32	15min	Development of correlation and its Comparison with a designed program using theoretical model for different parameter of foam hydraulics	<b>Amit Saxena</b> <amitsaxenaism@gmail.com>, Vishruth Reddy, Keka Ojha and A. K. Pathak	ISM Dhanbad, India
<b>TRACK-5: Renewable Energy</b> Track Co-Chairs: Bibek Bandyopadhyay, MNRE, GOI, India and I. M. Meshra, IIT Roorkee, India Session Chairs: <b>Bibek Bandyopadhyay</b> and <b>Ranjana Chowdhury</b> , Jadavpur University Coordinator: <b>Susmita Dutta</b> , NIT Durgapur Venue: Seminar Room-3, ChE Dept. Time: 14:40-16:40				

33	25min	<b>Keynote Talk</b> - Studies on Synthesis of Biodiesel from Microalgae Oil in Immobilized Lipase Bioreactors	 <b>C. M. Narayanan</b> <cmn_recd@yahoo.co.in>	NIT Durgapur
34	25min	<b>Keynote Talk</b> - Mathematical Modeling and Experimental Verification of Direct Glucose Anion Exchange Membrane Fuel Cell	<b>Suddhasatwa Basu</b> <sbasu@iitd.ac.in>	IIT Delhi, India
35	15min	Energy Efficient High Frequency Inverter for Operating CFL from Solar PV System	<b>Dola Sinha</b> <dola.sinha@gmail.com>, Pradip Kumar Sadhu and Dipak kumar Dhak	Dr. B. C. Roy Engg. College Durgapur, ISM Dhanbad
36	15min	Fuel Characteristics of Some Locally Available Biomass as a Potential Gasification Feedstock for Thermal Application	Partha Pratim Dutta <ppdutta06@gmail.com>, <b>Ashutosh Das</b> , Vivek Pandey	Tezpur University, Assam
37	15min	Exergetic Efficiency of Solar Air Heater Having Chamfered Rib-Groove Roughness on Absorber Plate	<b>Apurba Layek</b> <apurba_layek@yahoo.co.in>	NIT Durgapur
39	15min	Comparative routes of chemical pretreatment of water hyacinth biomass for xylose yield for ethanol production	Subhabrata Das, Amit Ganguly <amitganguly022@gmail.com>, <b>Diyali Mazumder</b> , Shilpa Ghosh, Sarita Sahani, Preeti Singh, Apurba Dey and Pradip Kumar Chatterjee	CMERI Durgapur, NIT Durgapur
<b>TRACK-6: Boiling and Condensation</b> Track Co-Chairs: Annirudhha B. Pandit, ICT Mumbai, India & Mahammad Kamil, AMU, Aligarh, India Session Chairs: Annirudhha B. Pandit, ICT Mumbai, India & Mahammad Kamil, AMU, Aligarh, India Venue: Seminar Room-1, Che Dept. Time:14:40-16:40				
41	25min	<b>Keynote Talk</b> - Empirical modeling for boiling incipience in an energy efficient closed loop vertical thermosyphon reboiler	 <b>M. Kamil</b> <sm_kamil@rediffmail.com>	Aligarh Muslim University (AMU), Aligarh
42	15min	Two phase flow boiling in 19mm tube	Madhavi V. Sardeshpande, <b>Arvind Ganesan</b> and Vivek V. Ranade <vv.ranade@ncl.res.in>	NCL Pune, IIT Roorkee

43	15min	Artificial neural network modeling in prediction of circulation rate for a vertical thermosiphon reboiler	<b>M. A. Hakeem</b> and M. Kamil	A.M.U. Aligarh
44	15min	Numerical Simulation for Void Fractions in Subcooled Boiling in a Vertical Channel	<b>Swapan Paruya</b> <swapanparuya@gmail.com>	NIT Durgapur
<b>TRACK-8: Transport Processes</b>				
Track Chairs: K. C. Ghanta, NIT Durgapur, India and Sadhan C. Jana, University of Akron, USA				
Session Chairs: <b>K. C. Ghanta</b> , NIT Durgapur and <b>Sudip K. Das</b> , University of Calcutta				
Venue: Seminar Room-2, ChE Dept.				
Time 14:40-16:40				
45	25min	<b>Keynote Talk</b> - Gas-liquid flow through helical coils – CFD Challenges	<b>Sudip K. Das</b> <drsudipkdas@vsnl.net>	University of Calcutta
46	15min	Modeling of spiral coil heat exchanger: model with easy simulation using MS-Excel	<b>A. M. Khan</b> , N. A. Khan, M Kamil	AMU, Aligarh
48	15min	A patterned membraneless microfluidic fuel cell	<b>Ravi K. Arun</b> <rarun2001@gmail.com>, Mounita Chatterjee, Vijay and Animangsu Ghatak	CSIR-CMERI, IIT Kanpur
Tea Break (16:40-16:50)				
Meeting of Session Chairs (16:50-17:30)				
<b>December 10, 2013</b>				
Registration (8:30-17:00): Chemical Engineering (ChE) Dept. / D. M. Sen Memorial (DMSM) Hall				
Interaction between Presenters and Session chairs (8:30-9:00): DMSM Hall				
<b>Plenary Talk</b> (9:00-9:40): DMSM Hall				
50	40min	Process Modeling and Optimization	 <b>Deoki N. Saraf</b> <dnsaraf@ddn.upes.ac.in>	University of Petroleum & Energy Studies, Dehradun, India
High Tea (9:40-9:50)				
<b>Plenary Talk</b> (9:50-10:30): DMSM Hall				
51	40min	Enhancing the Performance of Fossil Energy Systems through Information Maximization from Sensor Networks	 <b>Raghunathan Rengaswamy</b>	IIT Madras, India

			<raghur@iitm.ac.in>	
Tea Break (10:30-10:40)				
<b>Session on Nuclear Science and Engineering</b>				
Session Chairs: <b>P. K. Vijayan</b> , BARC, India and <b>Pradip Saha</b> , GE Hitachi Nuclear Energy, USA				
Venue: DMSM Hall				
Time: 10:40-13:00				
52		<b>Keynote Talks</b>		
53	40min	No Emergency Planning in Public Domain - The Way Ahead for Nuclear Power Plants	 <p><b>P. K. Vijayan</b> &lt;vijayanp@barc.gov.in&gt;</p>	DAE-BARC, Govt. of India
54	25min	Fast Breeder Reactors: Sustainable Energy Source for India	 <p><b>P. Chellapandi</b> &lt;pcp@igcar.gov.in&gt;</p>	DAE-IGCAR, India
55	25min	Thermal Hydraulics of Passive Safety Systems in Nuclear Power Reactors	 <p><b>Pradip Saha</b> &lt;pradip.saha@ge.com&gt;</p>	GE Hitachi Nuclear Energy, USA
56	25min	A Comprehensive Study on Rewetting in Connection the Post Accident Cooling of Nuclear Reactor Cores	<b>P. K. Das</b> <pkd@mech.iitkgp.ernet.in>	IIT Kharagpur, India
57	25min	Coolability of molten corium in severe accident conditions in Light Water Reactors	<b>A. K. Nayak</b> <arunths@barc.gov.in>,	DAE-BARC, India
<b>Tutorial on Neural Network for Energy Systems</b> by P. Ray, University of Calcutta & Somnath Nandi, MIT Pune				
Venue: Computing Laboratory, ChE Dept.				
Time: 10:40-13:00				
Basic Aspects of Neural Networks, EBP algorithm etc., XOR Problem. Neural Network Training, error minimization Graph, Working knowledge of Program				
Lunch (13:00-13:40)				
Tea Break (14:40-14:50)				



**TRACK-9: Computational Fluid Dynamics & Heat Transfer**

Track Co-Chairs: Gautam Biswas, IIT Guwahati, India &amp; Krishnaswami Nandakumar, LSU, USA

Session Chairs: **Krishnaswami Nandakumar**, USACoordinator: **Mrinal K. Mandal**, NIT Durgapur

Venue: DMSM Hall

Time: 14:50-17:10

59	25min	<b>Keynote Talk</b> - Application of Computational Fluid Dynamics in Steelmaking and Continuous Casting Processes	 <b>Asim K. Ray</b> <akray1952@gmail.com>	Lechler (India) Pvt. Limited
60	25min	<b>Keynote Talk</b> - Advanced Computer Models of Multiphase Processes at Appropriate Scales	 <b>Krishnaswamy Nandakumar</b> <nandakumar@lsu.edu>	Louisiana State University, USA
62	15min	Visualization of streamlines with their velocity profiles	<b>Paritosh Bhattacharya</b> <p_bhattacharya2001@yahoo.co.in>, Sangita Das, Uttam Kumar Bera	NIT Agartala, India
63	15min	Comparative assessment of One and Two-Dimensional Thermal Analyses of Semicircular Fins	R. Chakraborty, <b>E. Mandal</b> , A. Sirkar <amalesh.sirkar30@gmail.com>	Jadavpur University, Haldia Institute of Technology
65	15min	Effect of Free Rotating Vaneless Diffuser of Exit / Inlet Ratio 1.3 on Centrifugal Compressor Performance	<b>S. Seralathan</b> <sseralathan@hindustanuniv.ac.in>, D.G. Roy Chowdhury	Hindustan Institute of Technology and Science, India


**TRACK-10: Nonlinear Dynamics & Chaos in Energy Systems**

Track Co-Chairs: Subramanian Pushpavanam, IIT Madras, India and Ranga Narayanan, University of Florida, USA





Session Chairs: **Subramanian Pushpavanam** and **Ranga Narayanan**

Venue: Seminar Room-1, ChE Dept.

Time: 14:50-17:10

67	25min	<b>Keynote Talk</b> - Insights obtained from semi-analytical or perturbation solutions to fluid flow problems  <b>(Presented by R. Rengaswamy)</b>	 <b>Subramanian Pushpavanam</b> <spush@iitm.ac.in>	IIT Madras, India
----	-------	--	---	-------------------



68	25min	<b>Keynote Talk</b> - Patterns and Instability in Evaporating Binary Mixtures	 <b>Ranga Narayanan</b> <ranga@che.ufl.edu>	University of Florida, USA
69	25min	<b>Keynote Talk</b> - Effect of horizontal magnetic field on convective instabilities	 <b>Pinaki Pal</b> <pinaki.math@gmail.com>	NIT Durgapur, India
70	15min	Low-dimensional chaos for flow past staggered rows of square cylinders	<b>Dipankar Chatterjee</b> , Bittagopal Mondal, Gautam Biswas	CSIR-CMERI Durgapur, IIT Kanpur
71	15min	Nonlinear Analysis of Controlled Density Wave Oscillations in Boiling Channel at Low Forcing Frequency	<b>Nababithi Goswami</b> <nababithichemical@gmail.com>, Swapan Paruya	NIT Durgapur, India
72	15min	Identification of Bifurcations of Flyback Converter with Resistive Load Variation: Fundamental Periodicity to Period-Doubling	<b>Arnab Ghosh</b> <arnabghosh.ee@gmail.com>, Subrata Banerjee	NIT Durgapur, India
<p><b>TRACK-11: Optimization Techniques for Energy Systems</b>  Track Co-Chairs: Singiresu S. Rao, University of Miami, USA and Ali Elkamel, University of Waterloo, Canada  Session Chairs: <b>Singiresu S. Rao</b> and <b>Santosh K. Gupta</b>, University of Petroleum &amp; Energy Studies, India  Coordinators: <b>Jaya Sikder</b>, NIT Durgapur  Venue: Seminar room-3, ChE Dept.  Time: 14:50-17:10</p>				
73	25min	<b>Keynote Talk</b> - Genetic Algorithm- (GA-) based multi-objective optimization	 <b>Santosh K. Gupta</b> <skgupta@ddn.upes.ac.in>	University of Petroleum & Energy Studies, India
74	25min	<b>Keynote Talk</b> - An Overview of the Optimization of Renewable Energy Systems: Deterministic and Probabilistic Approaches	 <b>Sigiresu S. Rao</b> <srao@miami.edu>	University of Miami, USA

75	15min	Optimal allocation of CHP based DGs in distribution system considering load model	Partha Kayal <partha_kayal@yahoo.co.in>, C. K. Chanda	Future Institute of Engineering and Management, Bengal Engineering and Science University
76	15min	Multi scenario synthesis of hydrogen networks in a refinery	<b>Anoop Jagannath</b> , Ali Almansoori <aalmansoori@pi.ac.ae>	The Petroleum Institute, UAE
77	15min	Load Scheduling Optimization of Power Plants Using Mido Framework	<b>S. Mohan Kumar</b> <mohan.s.kumar@in.abb.com>, Marc Antoine, Tarun Prakash Mathur	ABB Bangalore Switzerland
78	15min	Optimization and optimal control of air conditioning system	Satish R. Inamdar <satish.inamdar@rediffmail.com> and <b>Milind M. Patwardhan</b> <milindpatwardhan@yahoo.com>	VIT Pune

Tea Break (17:10-17:20)

Conference Dinner (20:00-22:00)

**December 11, 2013**

Registration (8:30-14:00): Chemical Engineering (ChE) Dept. / D. M. Sen Memorial (DMSM) Hall

Interaction between Presenters and Session chairs (8:30-9:00): DMSM Hall

**Session on Industrial and Domestic Energy Saving Practices**

(In Association with Bengal Chamber of Commerce and Industry)

Chairs: **Binay K. Dutta**, West Bengal Pollution Control Board, India and **Nirmal K. Roy**, NIT Durgapur

Venue: DMSM Hall

Time: 10:30-12:30

Speakers:

**Binay K. Dutta**, West Bengal Pollution Control Board <binaykdutta@yahoo.com>

**Sarobindu Mohanta**, Petroleum Conservation Research Association <mohanta.emts@gmail.com>

**Gautam Ganguly**, Durgapur Projects Ltd.

Speakers from **SAIL-DSP, DVC-DTPS** and **NPTI**

**Tutorial on Neural Network for Energy Systems** by **P. Ray**, University of Calcutta & **Somnath Nandi**, MIT Pune

Venue: Computing Laboratory, ChE Dept.

Time: 10:30-12:30

Advanced Aspects of Neural Networks, Case studies and applications of neural network in energy systems.

Lunch (12:30-13:40)

**TRACK-11: Optimization Techniques for Energy Systems**

Track Co-Chairs: Singiresu S. Rao, University of Miami, USA and Ali Elkamel, University of Waterloo, Canada


Session Chairs: **Singiresu S. Rao** and **Santosh K. Gupta**, University of Petroleum & Energy Studies, India

Coordinators: **Jaya Sikder**, NIT Durgapur

Venue: Seminar room-3, ChE Dept.

Time: 13:40-15:40

79	15min	Multi-objective Optimization of an Industrial FCC Unit using Adaptive Social Evolution (ASE) Algorithm	Manojkumar Ramteke <ramtekemanoj@gmail.com>, <b>Vibhu Trivedi</b> , Nitish Ghune	IIT Roorkee, India
80	15min	Forecasting Electricity Consumption in India Based On Genetic Algorithm (GA) And Artificial Neural Network (ANN)	<b>Ankit A. Jain</b> <aa.jain@ncl.res.in>, A. Mehra and V .V. Ranade	IIT Bombay, NCL Pune
<b>TRACK-13: Advanced Control of Energy Systems</b> Track Co-Chairs: Babatunde A. Ogunnaike, University of Delaware, USA and Vinay K. Kariwala, ABB, India Session Chairs: <b>T. K. Radhakrishnan</b> , NIT Trichy Session Coordinator: <b>Chiranjib Koley</b> <chiranjib_k@yahoo.com>, NIT Durgapur Venue: DMSM Hall Time: 13:40-15:40				
84	25min	<b>Keynote Talk</b> - Review of new theories of automatic control applied to complex energy systems	 <b>Satish R. Inamdar</b> <satish.inamdar@rediffmail.com>	VIT Pune, India
85	15min	Model Identification for Duct Air Heating and Conveying System under Close Loop Condition	B. Satpati, S. Datta and <b>Chiranjib Koley</b> <chiranjib_k@yahoo.com>	University of Burdwan, NIT Durgapur, India
86	15min	A Graphical Method for finding Optimal Input Rate Constraint in Model Predictive Control	<b>Abhijit Datta</b> <abhijitdatta88@gmail.com>, Supriyo K. Mondal and Swapan Paruya	IIT Kharagpur, IIT Guwahati, NIT Durgapur
87	15min	Optimal temperature control of batch reactors	<b>Satish R. Inamdar</b>	VIT Pune, India
88	15min	Design of Sliding Mode Controller for an Ideal Reactive Distillation Column	Nikhil Avantsa, V.Kirubakaran, <b>T. K. Radhakrishnan</b> <radha@nitt.edu>, P.Kalaichelvi	NIT Trichy, India
<b>TRACK-14: Emission Reductions in Energy Generation</b> Track Co-Chairs: Binay K. Dutta, WBPCB, India and Narahari Marneni, Malaysia Session Chairs: <b>Binay K. Dutta</b> and <b>S. S. Bandopadhyay</b> , IIT Kharagpur Session Coordinator: <b>Jitamanyu Chakrabarty</b> <jito19@gmail.com> Venue: Seminar Room-1, DMSM Hall Time:13:40-15:40				
89	25min	<b>Keynote Talk</b> - Integrated Modeling of a Solid-Sorbent CO <sub>2</sub> Capture System		West Virginia University, USA

			Debangsu Bhattacharyya <Debangsu.Bhattacharyya@mail.wvu.edu>	
90	25min	<b>Keynote Talk-</b> CO <sub>2</sub> Emission Reduction Technologies: Challenges and Prospects	 <b>Bishnupada Mandal</b> <bpmandal@iitg.ernet.in>	IIT Guwahati, India
93	15min	Absorption of Carbon Dioxide into Piperazine Activated Aqueous Diethanolamine	<b>Binay Deogam</b> , Bisweswar Das, Arijit Mondal, Sanjib Barma, Bishnupada Mandal	IIT Guwahati
94	15min	Adsorption and separation of carbon dioxide using MIL-53 (Al) Metal Organic Framework	<b>Prashant Mishra</b> , Hari Prasad Uppara, Bishnupada Mandal, Sasidhar Gumma	IIT Guwahati
95	15min	Emission Reduction in Energy Generation From Marine Diesel Engines	<b>Anubhav Kumar</b> <anubhavgotam@gmail.com>	Indian Maritime University-Mumbai, India
Tea Break (15:40-15:50)				
Valedictory Session (15:50-16:30), DMSM Hall Speakers: <b>Ranga Narayanan</b> , University of Florida, USA <b>Krishnaswamy Nandakumar</b> , Louisiana State University, USA <b>Pradip Saha</b> , GE-Hitachi Nuclear Energy, USA <b>Tarkeshwar Kumar</b> , NIT Durgapur, India <b>S. S. Rao</b> , University of Miami, USA <b>P. Ray</b> , University of Calcutta, USA <b>Swapan Paruya</b> , NIT Durgapur, India				