Chapman Conference on Complexity and Extreme Events in Geosciences

National Geophysical Research Institute
Hyderabad, India
15–19 February 2010

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on Complexity and Extreme Events in Geosciences
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Meeting At A Glance

Monday, 15 February

08:00 a.m. – 09:45 a.m.	Registration and Breakfast
10:00 a.m. – 11:00 a.m.	Inauguration
11:00 a.m. – 12:00 p.m.	High Tea
12:00 p.m. – 01:30 p.m.	Session 1
01:30 p.m. – 03:00 p.m.	Lunch
03:00 p.m. – 04:30 p.m.	Session 2
04:30 p.m. – 06:30 p.m.	Tea Break/Session 3 – Poster Session
06:30 p.m. – 10:00 p.m.	Cultural Program & Dinner National Geophysical Research Institute

Tuesday, 16 February

08:00 a.m. – 09:00 a.m.	Breakfast
09:00 a.m. – 11:00 a.m.	Session 4
11:00 a.m. – 11:30 a.m.	Tea Break
11:30 a.m. – 01:00 p.m.	Session 5
01:00 p.m. – 02:30 p.m.	Lunch
02:30 p.m. – 04:30 p.m.	Session 6
04:30 p.m. – 06:30 p.m.	Tea Break/Session 7 – Poster Session

Wednesday, 17 February

08:00 a.m. – 09:00 a.m.	Breakfast
09:00 a.m. – 11:00 a.m.	Session 8
11:00 a.m. – 11:30 a.m.	Tea Break
11:30 a.m. – 01:00 p.m.	Session 9
01:00 p.m.	Lunch and Excursion/Sight-seeing /Dinner at the Sailing Club

Thursday, 18 February

08:00 a.m. – 09:00 a.m.	Breakfast
09:00 a.m. – 11:00 a.m.	Session 10
11:00 a.m. – 11:30 a.m.	Tea Break
11:30 a.m. – 01:00 p.m.	Session 11
01:00 p.m. – 02:30 p.m.	Lunch
02:30 p.m. – 04:30 p.m.	Session 12
04:30 p.m. – 06:30 p.m.	Tea Break/Session 13 – Poster Session

Friday, 19 February

08:00 a.m. – 09:00 a.m.	Breakfast
09:00 a.m. – 11:00 a.m.	Session 14
11:00 a.m. – 11:30 a.m.	Tea Break
11:30 a.m. – 01:00 p.m.	Session 15
01:00 p.m. – 02:00 p.m.	Lunch
02:00 p.m. – 03:15 p.m.	Session 16
03:15 p.m. – 03:30 p. m.	Tea Break
03:30 p.m. – 05:00 p. m.	Session 17 - Panel Discussion and Closing

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MONDAY, 15 FEBRUARY **10:00 a.m. – 12:00 p.m.**	
08:00 a.m. – 09:45 am.	Registration and Breakfast
10:00 a.m. - 11:00 p.m.	Inauguration
11:00 a.m. - 12:00 p.m.	High Tea
MONDAY, 15 FEBRUARY **SESSION 1** **12:00 p.m. – 01:30 p.m. – KEYNOTE SPEAKERS**	
12:00 p. m. – 12:30 p. m. **D. N. Baker**	The Economic and Societal Impacts of Extreme Space Weather Events
12:30 p.m. – 01:00 p.m. **H. van Storch**	Marine Storms - Analysis, Statistics and Changes
01:00 p.m. - 01:30 p.m. **H. Gupta**	Complex Seismic Activity at Koyna
01:30 p.m. – 03:00 p.m. –LUNCH	

MONDAY, 15 FEBRUARY

SESSION 2
03:00 p.m. – 04:30 p.m.

Time	Abstract Title	Presenting Authors
03:00 p.m.	Quantitative Modeling of Extreme Seismic Events	**A.T. Ismail-Zadeh** *(*Invited)
03:30 p.m.	Seismicity in the Generalized Vicinity of Strong Earthquake as the Most Studied Example of Arising of Instability in Natural Systems	**M.V. Rodkin**
03:45 p.m.	Complex Tectonics and Recent Earthquakes in Northeast India: A Review	**J.R. Kayal**

04:00 p.m.	Complex Seismic Structures in the Andaman-Sumatra Subduction Zone: Fractal Dimension and B-Value Mapping	**S. Roy**
04:15 p.m.	Possibility of Slow Viscoelastic Process or Change in Rheology in Late and Long-distance Triggering of Shocks in Gujarat, Western India After the 2001 Mw 7.7 Bhuj Earthquake	**B.K. Rastogi**
TEA BREAK/SESSION – 3 **04:30 p.m. - 06:30 p.m.** *Posters will be posted from 10:00 a.m. in the hall*		
1	Examination of the Distribution of Maximum Earthquake Magnitudes by Combining the GEV and GPD Limit Distributions of Extreme Value Theory	**M.V. Rodkin**
2	Foreshock Clustering as Precursory Pattern for the Kachchh Earthquakes in Gujarat, India	**S.K. Aggarwal**
3	Fractal Analysis and B-value Estimation for Earthquakes from Northwest Himalayan Region	**A. Devi**
4	Simulation of Strong Motion Parameters Using Deterministic Modeling of Finite Source of Two Himalayan Earthquakes	**A. Joshi**
5	B-value and Fractal Dimension Imaging of the Epicentral Zone of the 2001 Bhuj Earthquake, Gujarat, India	**P. Mandal**
6	Spatial and Temporal Variations of B-value and Fractal Analysis of the Earthquake Distribution from the Andaman-Sumatra Subduction Zone of the Indian Ocean	**V.S. Rani**
7	Extreme Events Recovered in Subsurface Images Along the Tamil Nadu Coast	**R. Nair**
8	Doughnut Precursory Seismicity Patterns in the Indian Shield Earthquakes: An Observation	**B. Rao**
9	Statistical Study of Himalayan Seismicity	**K. Kanna Babu**
10	S-wave Spectral Modeling of 244 Aftershocks of the 2001 Mw7.7 Bhuj Mainshock	**S.K. Dutta**
11	Site-Dependent Attenuation Study for Peninsular Shield of India	**C. Singh**
12	Tectonic Implications and Seismicity Triggering During Mw 6.4 Baluchistan, Pakistan Earthquake Sequence of October 28-29, 2008	**R.B.S. Yadav**
13	Extreme Seismic Events and Gravity Anomalies in the Subduction Zones	**V.M. Tiwari**
14	Analysis of the Seismicity of the Andman Region	**A.R. Bansal**

15	Slip Predictable Behaviour for Seismicity of Garhwal Himalaya, India	**A. Chamoli**
16	Analysis of Earthquake Data of Himalayas - A New Approach	**V.V. Hara Gopal**
17	Identification of Seismicity Pattern for Some Destructive Earthquakes	**P.N.S. Roy**
18	Nonlinearity in Origin of Ridges in Indian Oceanic Lithosphere	**B. Ashalatha**
19	Seismotectonics in Northeast India: A Stress Analysis of Focal Mechanisms of Earthquakes and Its Kinematic Implications	**S. Baruah**
20	Attenuation Relation for Garhwal Himalaya Obtained Using Damped Least Square Method	**A. Kumar**
21	Seismogenesis of the Lower Crustal Intraplate Earthquakes Occurring in the Kachchh Seismic Zone, Gujarat, India	**P. Mandal**
22	Paleoseismological Study in the Nepal Himalaya – Present Status	**B.N. Upreti**
23	Earthquake Epicenters Linked to the Positions of the Sun, Moon and Planets: An Instance of Organized Behavior in Complex Systems	**S.K. Ghosh**
24	Fractal Clustering of Reservoir Induced Seismicity in the Koyna-Warna Reservoir Area	**S. Padhy**
25	B-value Mapping in Hindukush-Pamir Himalaya Region: Evidence of Phase Transformation of Material Within Subducting Slab	**R.B.S. Yadav**

06:30 p.m. – 10:00 p.m.

Cultural Program Followed by Hosted Dinner at NGRI

TUESDAY, 16 FEBRUARY

SESSION 4
09:00 a.m. – 11:00 a.m.

Time	Abstract Title	Presenting Aurthors
08:00 a.m.	Breakfast	
09:00 a.m.	The Complex Nonlinear Process of Equatorial Spread F: How Far Are We From Operational Predictability?	**R. Sridharan** *(*Invited)
09:30 a.m.	Electrostatic Solitary Waves in Non-Thermal Plasmas	**S.V. Singh**

09:45 a.m.	Severe and Long-Lasting Geomagnetic Storms, Their Solar Sources and Related Disturbances in Near-Earth Geospace	**B. Badruddin** **WITHDRAWAL**
10:00 a.m.	The Probability Distribution of Extreme Geomagnetic Events in the Auroral Zone	**R. Weigel** *(*Invited)
10:30 a.m.	Extreme Geomagnetic Storms and Low Latitude Geomagnetic and Ionospheric Response	**B. Veenadhari**
10:45 a.m.	Occurrence of Anomalous Geomagnetic Event During Recent Solar Cycle	**V.C. Dwivedi**
11:00 a.m.- 11:30 a.m. TEA BREAK		
TUESDAY, 16 FEBRUARY **SESSION 5** **11:30 a.m. – 01:00 p.m.**		
11:30 a.m.	Extreme Events in Space Weather: Characterizing the Inherent Statistical Properties	**T. Veeramani** *(*Invited)
12:00 p.m.	Index of Recurrence Asymmetry in Complex Systems: Application to Sunspots and Earth Surface Temperature Anomalies	**V.B. Kiselev** **WITHDRAWAL**
12:15 p.m.	A Study on Chaotic Behaviour of Equatorial/Low Latitude Ionosphere Over Indian Subcontinent, Using GPS-TEC Time Series	**K. Unnikrishnan**
12:30 p.m.	Stratospheric ozone Depletion and Its Management: Lessons from the Montreal Protocol for Combating Other Artificially Induced Perturbations	**R. Gopichandran**
12:45 p.m.	Characteristics of Auroral Electrojets During Intense Geomagnetic Activities	**A.K. Singh**
01:00 p.m. - 02:30 p.m. LUNCH		
TUESDAY, 16 FEBRUARY **SESSION 6** **02:30 p.m. – 04:30 p.m.**		
02:30 p.m.	The Challenge of Diagnosing a Nonlinear Geophysical Theory of Floods in River Networks and Potential Applications Under Climate Change	**V.K. Gupta** *(*Invited)
03:00 p.m.	Extreme Event for Earthquake Triggered Landslides	**J.R. Grasso**
03:15 p.m.	Seismicity Analysis and Simulation of a Possible Tsunamigenic Earthquake from the Andaman Region: Impact Along the East Coast of India	**V.P. Dimri**
03:30 p.m.	Multifractal Extreme Value Theory (MEV)	**D. Schertzer** (Invited)

04:00 p.m.	Fractal and Multifractal Characteristics of Time Series in Seismogenic Regions of 1897 Assam, 1905 Kangra and 1934 Bihar Great Earthquakes	**S.S. Teotia**
04:15 p.m.	Extreme Events – Methodologies for a Rational Approach to Deal with Extreme Natural Events Under Intrinsic Uncertainty	**F. Wenzel**
TEA BREAK / SESSION – 7 **04:30 p.m. – 06:30 p.m.** *Posters will be posted from 10:00 a.m. in the hall*		
1	Influence of Solar Wind Plasma and Interplanetary Magnetic Field on the Low-latitude Geomagnetic Variations During Descending Phase of Solar Cycle 23	**R. Rawat**
2	Understanding the Severe Magnetic Disturbances of October 2003 – Challenges for Modelling	**N. Nagarajan**
3	Nonlinear Solitary Electric Field Structures in the Earth's Magnetosphere	**R. V. Reddy**
4	Investigation of Intense Geomagnetic Storms and Associated Cosmic Ray Intensities: A Correlative Study	**S. C. Kaushik**
5	Space Applications in Disaster Assessment and Mitigation: Examples from Haryana State, India	**B. S. Chaudhary**
6	Using Forbush Decrease Events for the Prediction of Geomagnetic Storms	**M. Jain**
7	SKS/SKKS Splitting in the Kachchh rift Zone, Gujarat, India	**P. Mandal**
8	Modeling to Assess Tsunami Effects on the Indian Coasts From Earthquakes Along Makran and Andaman-Sumatra Subduction Zones	**A.P. Singh**
9	Inundation Modeling at Different Locations Along the West Coast of India Due to Tsunamigenic Earthquakes From the Makran Subduction Zone	**R. Krishna Kumar**
10	Investigations Into Cause of High Lightning Incidence and Accidents By It in a Region With Relatively Special Characteristics	**R. Vishnu**
11	Seismic Response in an Anisotropic Medium	**M. Majumder**
12	Inversion of 2-D Resistivity Data Using Rapid Optimization and Minimal Complexity Neural Network	**U. Singh**
13	Can We Resolve NMO and DMO-Nonlinear Problems in Exploration Seismic	**N.L. Mohan**
14	A Study on Non-Linear 3-D Wavelet for Scale Extraction	**D. Sujatha**
15	Estimation of Crustal Discontinuities From Reflected Seismic Waves Recorded at Shillong and Mikir Hills Plateau, North East India	**S. Baruah**

16	Discovery of Hydrocarbon in Cretaceous Deccan Basalt, India	**A.M. Dayal**
17	Artificial Neural Networks (ANN) Based Modeling for Landslides Susceptibility Zonation in Parts of Himalayas	**L. Nwankwo**
18	Radon Transform and Its Application In Seismic	**P.P. Mandal**
19	Multicomponent Seismic Applications in Coalbed Methane Development	**S. Gupta**
20	Gottwald-Melbourne Test for Chaos of Nonlinear Fluctuations in Complex Laboratory Plasmas	**A.N. Iyengar**
21	Characterization of Recharge Through Complex Vadose Zone of a Granitic Aquifer by Time-Lapse Electrical Resistivity Tomography	**T. Arora**
22	Study of Coseismic Ground Deformation Due to Recent Earthquakes & Crustal Deformation Measurements on Active Faults In and Around India Using SAR Interferometry	**S. P.Satyabala**

WEDNESDAY, 17 FEBRUARY

Session 8
09:00 a.m. – 11:00 a.m.

Time	Abstract Title	Presenting Authors
08:00 a.m.	Breakfast	
09:00 a.m.	A Peep into the Complexities and Dynamics of Large Himalayan Earthquakes to Assess Their Role in the Preparedness for Future Extreme Seismic Events	**B.R. Arora** (Invited)
09:30 a.m.	Continuous Time Random Maxima: Stochastic Models for Estimating Recurrence of Extreme Events in Time Series With Long Range Correlations	**R. Schumer**
09:45 a.m.	Estimation of the Ground Motion and Site Effects of Indo-Gangetic Plains	**D. Srinagesh**
10:00 a.m.	Entropy Production and Self-organised (sub) Criticality in Earthquake Dynamics	**I. Main** *(*Invited)
10:30 a.m.	Could the Magnitude of an Earthquake be Bounded From Above?	**V. Srivastava**
10:45 a.m.	Quality Assessment, Reserve Estimation & Economic Analysis of Roofing Slate in the West Central Lesser Himalaya-Nepal	**N.R. Neupane** **WITHDRAWAL**

11:00 a.m. - 11:30 a.m. **TEA BREAK**

WEDNESDAY, 17 FEBRUARY

Session 9
11:30 a.m. – 01:00 p.m.

11:30 a.m.	Long-term Memory in Climate Records: Clustering of Extreme Events and the Detection Problem	**S. Lennartz** *(*Invited)
12:00 p.m.	Extreme Events in Precipitation and River Flows: Effect of Linear and Nonlinear Correlations	**A. Bunde**
12:15 p.m.	Extreme Events, Return Intervals and Long Term Memory	**M. Santhanam** *(*Invited)
12:45 p.m.	Study on Hydro-chemical Change of Epikarst Spring Based on Extreme Weather in the Jinfo Mountain of Chongqing: A Case Study of Extreme Drought 2006, Chongqing	**L. Linli**
01:30 pm **Lunch and Excursion / Sight-seeing / Dinner at the Sailing Club**		
THURSDAY, 18 FEBRUARY **Session 10** **09:00 a.m. – 11:00 a.m.**		
Time	**Abstract Title**	**Presenting Authors**
08:00 a.m.	Breakfast	
09:00 a.m.	On the Statistics of Extremes in Space Weather Events – A Review of Statistical Methods Recently Applied on Solar Flare and Geomagnetic Storms Data	**J. Eichner** *(*Invited)
09:30 a.m.	Landslide Dam Outburst Flood in the Satluj Valley, Himachal Pradesh, India	**V. Gupta**
09:45 a.m.	Thermal Upwellings, Magmatic Extrusion and Intra-plate Rift Valley Earthquakes in India	**O.P. Pandey**
10:00 a.m.	Climate Catastrophe: Spectral Characteristics and Model Behavior of Abrupt Climate Changes Over Present to Millennial Time Scales	**R.K. Tiwari**
10:15 a.m.	Wavelet Analysis of Marine Oxygen Isotope δ18O Record	**M. Ravi Prakash**
10:30 a.m.	Archives of Extreme Events in Holocene in the Himalaya	**S.P. Sati**
10:45 a.m.	Surface and Deep Water Characteristics in the Northeast Indian Ocean During the Last 60,000 Years as Inferred From Carbon and Oxygen Isotopic Compositions of Foraminifera	**S.M. Ahmad**
11:00 a.m.	Rodinia Supercontinent, Snowball Earth and Extreme Global Paleoclimate Change: Evidences From the Lesser Himalaya and Marwar Supergroup, India	**V.C. Tewari**
11:00 a.m. – 11:30 a.m. TEA BREAK		
THURSDAY, 18 FEBRUARY **SESSION 11** **11:30 a.m. – 01:00 p.m.**		

11:30 a.m.	A Nonlinear Synthesis for Understanding Atmospheric Complexity: Space-Time Cascades	**S. Lovejoy** *(*Invited)
12:00 p.m.	Application of Doppler Wind Lidar Observations to Improve Scientific Understanding and Forecasting of Extreme Weather Events	**U. Singh**
12:15 p.m.	Assessing the Characteristics of Extreme Rainfall Through an Examination of Atmospheric Circulation States Using Self-Organizing Maps	**C.J. Lennard**
12:30 p.m.	Operation of Multi-objective Multi-reservoir System under Climate Change Complexities	**M. Zarghami** **WITHDRAWAL**
12:45 p.m.	Wintertime Climatic Analysis Over the Western Himalayas	**A.P. Dimri**
01:00 p.m. – 02:30 p.m. LUNCH		
THURSDAY, 18 FEBRUARY **Session 12** **02:30 p.m. – 04:30 p.m.**		
02:30 p.m.	Thermal State of the Indian Crust by Minimizing Rate of Entropy Production	**R.N. Singh (**Invited)
03:00 p.m.	Storm Coals: A Extreme Depositional Systems in South Brazil Deposits	**M.A.M. Medeiros**
03:15 p.m.	Recent Extreme Wet and Dry Spells Across India	**N. Singh**
03:30 p.m.	Influence of Debris Cover on the Melting Processes of Glacier - a Study on Chorabari Glacier, Garhwal Himalaya, India	**D.P. Dobhal**
03:45 p.m.	Spectral Characterization of Soil and Coal Contaminated Snow Reflectance Using Hyperspectral Analysis	**S.K. Singh**
04:00 p.m.	Impact of Glacial Lake Outbursts in the Buffer Zone of Nanda Devi Biosphere Reserve, Central Himalaya, Uttarakhand	**M.P.S. Bisht**
04:15 p.m.	The High Himalayan Orogeny Time: Upper – Early Oligocene?	**D. Gopala Rao**
TEA BREAK / SESSION – 13 **04:30 p.m. - 06:30 p.m.** *Posters will be posted from 10:00 a.m. in the hall*		
1	Declining Predictability of Indian Summer Monsoon Weather, in the Backdrop of Increasing Heavy Rainfall Events	**J.M. Neena**
2	High Intensity Rainfall Event on Subsurface Water Regime: A Case Study in Granite Watershed, Andhra Pradesh, India	**R. Rangarajan**
3	Analysis and Prediction of Rainfall Data: Fractal Approach	**R. Srivastava**

4	Scaling and Persistence in Ground Level Ozone Concentrations in Delhi	**A. Chelani**
5	Productivity Pattern in the Equatorial Indian Ocean During the Last 300,000 Years	**M.S. Krishna**
6	Extremely Long Duration Total Solar Eclipse on 22 July, 2009: Effect on D-region Ionosphere Dynamics as Studied from VLF Signals Observations	**R. Singh**
7	Consequences of the Fossil Fuel Extraction on the Climate Change of the Earth	**B. Kumar**
8	Some Characteristics of the K-T Boundary Mass Extinction Event	**P. Tripathi**
9	Complex Dynamics and Multi-scale Structure of Sediment Transport: Experimental Evidence and Theoretical Insights	**V. Ganti**
10	Geomorphic Evolution of Himalaya and its Foreland: The Last 60 ka Perspective	**P. Srivastava**
11	Active Deformation Within MBT-HFT Tectonic Wedge in Trans-Yamuna Dun of NW Sub-Himalaya: Implication on Seismic Slip Partitioning	**G.D. Singh**
12	A GIS Tool to Automatically Extract Area Altitude Distribution of Glaciers	**R. Kaur**
13	Seafloor Characterizations Using Multi-Beam Bathymetry and Backscatter Data: Appraisal of Numerical Techniques Employed	**B. Chakraborty**
14	Mantle Convection Stirring Efficiency With Both Basal and Internal Heating	**B. Deo**
15	Hydrological Complexity Model of Active Upper Crust Under Koyna (India) Region	**R.N. Singh**
16	Sustainable Management of Coral Island Aquifer Through Numerical Modeling	**P. Banerjee**
17	Deciphering Zeolitic Formations in Deccan Basalt – An Indirect Method of Finding Groundwater in Hard Rock Using Integrated Geophysical Approach	**D. Kumar**
18	Mantle Plumes, Their Depth of Origin Within the Mantle and Excess Temperatures	**S. Das Sharma**

FRIDAY, 19 FEBRUARY **Session 14** **09:00 a.m. – 11:00 a.m.**		
8:00 a.m.	Breakfast	
09:00 a.m.	Distributions of Extreme Bursts Above Thresholds in a Fractional Lévy Toy model of Natural Complexity	**N. Watkins** (Invited)
09:30 a.m.	Constraints on the Tectonic Setting of the Andaman Ophiolites, Bay of Bengal, India, From SHRIMP U–Pb Zircon Geochronology of Plagiogranite	**S.H. Jafri**
09:45 a.m.	Understanding the Complex Behavior of Crustal Heat Production	**N. Vedanti**
10:00 a.m.	Super Magnetic Storms: Hazard to Society	**G.S. Lakhina** (*Invited*)
10:30 a.m.	Nonlinear Development of Equatorial Ionospheric Plasma Bubbles: Evolution of intermediate scale structures	**A. Bhattacharya**
10:45 a.m.	Is There a Timescale Where the Clausius-Clapeyron Relation Describes Precipitation Rate Changes?	**J.O. Haerter**
11:00 a.m. – 11:30 a.m. TEA BREAK		
FRIDAY, 19 FEBRUARY **Session 15** **11:30 a.m. – 01:00 p.m.**		
11:30 a.m.	Landslide Studies and Mitigation –With a Focus on Varunavat Landslide in Uttarkashi, Uttarakhand Himalaya, India	**P.C. Nawani** (Invited)
12:00 p.m.	Analysis and Prediction of Extreme Day Mean Values of Total Ozone Amount Interannual Changes Over Europe in the Period From 1979 to 2006 Years	**M. Nikiforova**
12:15 p.m.	The Singularity Structure of Indian Monsoon Rain	**V. Venugopal**
12:30 p.m.	Modeling Flow Over An Aligned Flat Surface Using Blasius Equation	**B. Basu**
12:45 p.m.	Intercomparison of the Total Storage Deficit Index (TSDI) Over Two Prairie Catchments	**C.O. Agbona**
01:00 p.m. - 02:00 p.m. LUNCH		

Session 16 **02:00 p.m. – 03:15 p.m.**		
02:00 p.m.	Sesmological Constraints of Great Kangra Earthquake of 1905 and Associated Hazard in NW India	**H.N. Srivastava** (Invited)
02:30 p.m.	Crust-mantle Structure Below the Indo-Gangetic Plains	**R.K. Chadha**
02:45 p.m.	Earthquake Interevent Time Distributions Reflect The Proportion of Dependent and Independent Events Pairs And Are Therefore Not Universale	**M. Naylor**
03:00 p.m.	Interplanetary Transient Solar Wind Flows and Extremely Disturbed Geomagnetic Field Conditions	**S.C. Kaushik**
03:15 p.m. – 03:30 p.m. TEA BREAK		
Session 17 **Panel Discussion and Closing** **03:30 p.m. – 05:00 pm**		