Scientific Programme

Sun, Space Weather and Solar-Stellar Connections

An international conference commemorating 125 years of Kodaikanal Solar Observatory

Organised by the

Indian Institute of Astrophysics, Bengaluru

January 20 - 24, 2025

Venue: Auditorium, St. John's Research Institute, Bengaluru-34

Celebrating 125 Years
Kodaikanal Solar Observatory
Since 1899

Invited Review | Invited | Contributed

Day 1: Monday, January 20, 2025 Theme: **Solar Magnetism over Long Timescales**

09:00 - 09:55	**Inaugural Session**
09:55 - 11:10	**Long Term Synoptic Observations, Chairperson: Paul Charbonneau**
09:55 - 10:15	Unveiling the Significance of Ca II K Observations for Long-Term Solar Irradiance Reconstructions, **Theodosios Chatzistergos**
10:15 - 10:30	Revisiting Sunspot Groups Tilt Angle Study from Kodaikanal Data, **Manjunath Hegde**
10:30 - 10:45	Characteristics of Supergranulation Network from Kodaikanal Archival Data, **K. P. Raju**
10:45 - 11:10	Exploring Solar Magnetism over Long Time Scales with Regular Full-disc Observations, **Ilaria Ermolli (On Zoom)**

11:10 - 11:40 Posters/Coffee Break

11:40 - 13:00	**Solar Interior Dynamics, Chairperson: S.P. Rajaguru**
11:40 - 12:05	Helioseismology with Inertial Modes, **Laurent Gizon**
12:05 - 12:20	A Unified Family of Mixed Inertial Modes in the Sun, **Rekha Jain**
12:20 - 12:40	Inertial Waves in the Solar Convection Zone, **Catherine Blume**
12:40 - 13:00	Reconciling Helioseismic Measurements of Solar Deep Meridional Flow from SDO/HMI and GONG Observations. **Ruizhu Chen (On Zoom)**

13:00 - 14:15 Lunch

14:15 - 15:45	**Dynamo Models and Observations, Chairperson: Arnab Rai Choudhuri**
14:15 - 14:40	Nonlinearities, Stochasticity, and Long-term Modulations in Solar and Stellar Dynamos **Paul Charbonneau**
14:40 - 14:55	Deep Cyclic Activity and Radial Flux Transport in the Sun by Assimilating Observed Magnetogram in a 3D Dynamo Model, **Soumyadeep Chatterjee**
14:55 - 15:10	Surmounting the Solar Grand Minima: A Quantification of the Polar Flux Threshold, **Chitradeep Saha**
15:10 - 15:30	Observational Constraints for Dynamo Modeling & Active Region Flux Emergence Patterns, **Aimee Norton**
15:30 - 15:45	Statistical Properties of Solar Active Region Potential Magnetic Fields, **Stephane Regnier**

15:45 - 16:30 Posters/Coffee Break

16:30 - 17:45	**Solar Cycle Variations in the Interior, Chairperson: Rekha Jain**
16:30 - 16:55	Solar Cycle Variations in the Solar Interior, **H. M. Antia**
16:55 - 17:10	Flows Around Active Regions and Changes in the Near-surface Shear Layer of the Sun, **S.P. Rajaguru**
17:10 - 17:30	MHD Global Nonlinear MHD of Solar Tachocline and Implications for Surface Magnetism, **Mausumi Dikpati**
17:30 - 17:45	Study of Bipolar Magnetic Regions using AutoTAB: Support of Thin Flux Tube Model?, **Anu Sreedevi**

Day 2: Tuesday, January 21, 2025 Theme: **Solar Magnetism in High Resolution**

09:00 - 10:45	**High Resolution Observations of Solar Magnetic Fields, Chairperson: Luis Bellot Rubio**
09:00 - 09:25	A High Resolution View of Solar Magnetic Fields, **Jaime de la Cruz Rodriguez**
09:25 - 09:40	High-resolution Measurements of Coronal Magnetic Field in Solar Flares and Associated Phenomena, **Gregory Fleishman**
09:40 - 09:55	Unravelling the Stratification of the Chromospheric Magnetic Field Using the Hα Line, **Harsh Mathur**
09:55 - 10:15	Solar Magnetic Fields Before and During Eruptions, **Maria Kazachenko**
10:15 - 10:30	Unveiling the Dynamics and Genesis of Small-scale Fine Structure Loops in the Lower Solar Atmosphere, **Annu Bura**
10:30 - 10:45	Magnetic Field and Plasma Diagnostics Using Infrared Spectral Lines: Forward Modeling, **Weihang Zhang (On Zoom)**

10:45 - 11:15 Posters/Coffee Break

11:15 - 13:00	**Solar Chromospheric Dynamics, Chairperson: David Jess**
11:15 - 11:40	Solar Chromospheric Dynamics, **Bart De Pontieu**
11:40 - 11:55	Quiet-Sun Ellerman Bombs and Their Impact on the Upper Solar Atmosphere, **Jayant Joshi**
11:55 - 12:10	Simulations of the Solar Spicule Forest - Dependence on Magnetic Field Strength and Coronal Temperature, **Piyali Chatterjee**
12:10 - 12:25	Vortex Dynamics in Various Solar Magnetic Field Configurations, **Nitin Yadav**
12:25 - 12:40	Chromospheric and Coronal Heating in Active Regions: A Joint Perspective from Observations and Numerical Simulations, **Souvik Bose**
12:40 - 13:00	Small-scale Swirls in the Solar Atmosphere, **Jiajia Liu (On Zoom)**

13:00 - 14:30 Lunch

14:30 - 16:10	**Waves in the Solar Atmosphere , Chairperson: Robertus Erdelyi**
14:30 - 14:55	MHD Waves in the Solar Atmosphere: Recent Advances from High-resolution Observations, **Shahin Jafarzadeh**
14:55 - 15:10	Investigation of Umbral Wave Dynamics in the Chromospheric Resonator through Multi-Height Observations, **Kartika Sangal**
15:10 - 15:25	Shock Wave Propagation in the Solar Atmosphere, **Ravi Chaurasia**
15:25 - 15:50	Exploring Wave Coupling and Energy Dissipation in the Solar Atmosphere, **Elena Khomenko**
15:50 - 16:10	The Properties of Propagating Compressive Waves in a Multithermal Coronal Loop, **S. Krishna Prasad**

16:10 - 16:55 Posters/Coffee Break

16:55 - 18:10	**Instruments/Facilities and Science: New and Upcoming, Chairperson: Dipankar Banerjee**
16:55 - 17:15	Scientific Achievements Based on Data from Solar Orbiter/EUI, **Hardi Peter**
17:15 - 17:35	Aditya - L1, **K. Sankarasubramanian**
17:35 - 17:50	The Fabry-Pérot Imaging Spectropolarimeters for the European Solar Telescope, **Luis Bellot Rubio**
17:50 - 18:10	VELC onboard ADITYA-L1, the 1st Indian Space Solar Coronagraph, **R. Ramesh**

Day 3: Wednesday, January 22, 2025 Theme: **Energetic Phenomena**

9:00 - 10:45	**Jets and Magnetic Reconnection, Chairperson: Nat Gopalswamy**
09:00 - 09:25	Spicules and Jets in the solar Chromosphere: A Perspective of Recent Advances, **Tiago Pereira**
09:25 - 09:40	The Magnetic Origin of Solar Coronal Jets and Campfires: SDO and Solar Orbiter Observations, **Navdeep Panesar**
09:40 - 09:55	Transition Region Brightening in a Moss Region and their Relation with Lower Atmospheric Dynamics, **Tanmoy Samanta**
09:55 - 10:15	Small-scale Magnetic Flux Emergence Preceding a Chain of Energetic Solar Atmospheric Events, **Daniel Nóbrega-Siverio**
10:15 - 10:30	Campfires and Nanoflares: Signatures of Finest-scale Magnetic Reconnection in Quiet-Sun Corona Observed by Extreme Ultraviolet Imager aboard Solar Orbiter, **Nancy Narang**
10:30 - 10:45	Localized Heating and Dynamics in Coronal and Chromospheric Plasmas due to a Symbiosis of WAves and Reconnection (SWAR), **Abhishekh Kumar Srivastava**

10:45 - 11:15 Posters/Coffee Break

11:15 - 12:45	**Flares and CMEs , Chairperson: Abhishekh Srivastava**
11:15 - 11:40	Origin and Energization of Solar Eruption Events, **Xin Cheng (On Zoom)**
11:40 - 11:55	Low Coronal Disturbances and Coronal Mass Ejections, **Nariaki Nitta**
11:55 - 12:15	Solar Jets: Insights from High-Resolution Observations and Numerical Simulations, **Reetika Joshi**
12:15 - 12:30	Onset, Eruption, and Thermal Properties of Coronal Jets via MHD Simulation, **Sushree Sangeeta Nayak**
12:30 - 12:45	Small and Large Scale Episodic Events in Smaller and Larger Scale Numerical Simulations Spanning the Convection Zone to the Corona, **Viggo Hansteen**

12:45 - 14:15 Lunch

14:15 -15:30	**Shocks and Particle Acceleration and Transport in IP Medium, Chairperson: Nandita Srivastava**
14:15 - 14:40	Energetic Particle Acceleration and Transport: Interplanetary Coronal Mass Ejections and Shocks, **Olga Malandraki (On Zoom)**
14:40 - 14:55	Connecting Energetic Electrons at the Sun and in the Heliosphere through X-ray and Radio Diagnostics, **Nicole Vilmer**
14:55 - 15:15	Suprathermal Ion Observations Associated with the Heliospheric Current Sheet Crossings by Parker Solar Probe, **Mihir Desai**
15:15 - 15:30	Time Evolution of Thermal and Non-thermal Energies in Solar Flares, **Soumya Roy**

15:30 - 16:15 Posters/Coffee Break

16:15 -17:35	**Instruments/Facilities and Science: New and Upcoming, Chairperson: P. Venkatakrishnan**
16:15 - 16:35	National Large Solar Telescope (NLST) of India, **B. Ravindra**
16:35 - 16:50	Performance of the Upgraded GRIS@GREGOR Spectrograph, **Manuel Collados**
16:50 - 17:05	Solar Orbiter/EUI Observations and a Bifrost MHD Simulation of Fine-scale Dot-like Heating Events in Emerging Flux Regions, **Sanjiv Tiwari**
17:05 - 17:20	The Gauribidanur Radio Observatory: Current Status and Future Plans, **C. Kathiravan**
17:20 - 17:35	Investigations on Suprathermal Ions Observed by ASPEX/STEPS on board Aditya-L1 During its Earth-bound Orbits, **Bijoy Dalal**

19:00 **Director's Dinner, IIA Campus.**

Day 4: Thursday, January 23, 2025 Theme: **Solar - Stellar Connections**

9:00 - 10:35	**The Sun as a Prototype of Stellar Variability** **Chairperson: Elena Khomenko**
09:00 - 09:20	The Sun as a Proxy for Stellar Variability, **Nina-Elizabeth Nemec**
09:20 - 09:35	The Role of Meridional Flow in the Generation of Solar/Stellar Magnetic Fields and Cycles, **Vindhya Vashisht**
09:35 - 09:50	Dynamics of Photospheric Magnetic Flux Distribution and Variations in Solar RVs: A Study Using HARPS-N Solar and SDO Observations, **Anisha Sen**l
09:50 - 10:10	In situ Observation of Mass Ejections Caused by Magnetic Reconnections in the Ionosphere of Mars, **Yudong Ye (On Zoom)**
10:10 - 10:35	The Sun as a Prototype of Stellar Variability, **Sami K Solanki (On Zoom) (?)**

10:35 - 11:05 **Posters/Coffee Break**

11:05 - 12:05	**Asteroseismology,** **Chairperson: Brajesh Kumar**
11:05 - 11:30	Solar-like Stars: Seismology and Stellar Magnetic Activity, **Savita Mathur**
11:30 - 11:45	Latitudinal Differential Rotation in Red Giants, **Meenakshi Gaira**
11:45 - 12:05	Anomalous Rotators and New Evolutionary Pathways in Red Giants, **Shravan Hanasoge**

12:05 - 13:30 **Lunch**

13:30 - 14:45	**Solar/Stellar Dynamo and Activity,** **Chairperson: Mausumi Dikpati**
13:30 - 13:55	Progress in Modelling Solar and Stellar Activity Cycles, **Alfio Bonanno**
13:55 - 14:10	Dynamo Modelling for Cycle Variability and Occurrence of Grand Minima in Sun-like Stars at Different Rotation Rates, **Bidya Binay Karak**
14:10 - 14:25	3D Radiative MHD Models of Cool Main-sequence Starspots, **Tanayveer Singh Bhatia**
14:25 - 14:45	Star-Planet Interactions: From Solar System Planets to Exoplanets, **Dibyendu Nandi**

14:45 - 15:30 **Posters/Coffee Break**

15:30 - 16:30	**Stellar Activity as a Limiting Factor for Characterising Exoplanets** **Chairperson: Ravinder Banyal**
15:30 - 15:55	Stellar Activity as a Limiting Factor for the Discovery and Characterisation of Exoplanets, **Ignasi Ribas** (IEEC, ICE, CSIC, Spain)
15:55 - 16:10	Magnetospheric Dynamics and Atmospheric Mass Loss driven by Solar-Stellar Winds and Storms, **Sakshi Gupta**
16:10 - 16:30	Magnetic Interaction of Stellar Coronal Mass Ejections with Close-in Exoplanets, **Gopal Hazra**

17:00 - 18:15 **Public Lecture, "The Sun" by Nat Gopalswamy at the Christ University**

19:00 **Conference Dinner**

Day 5: Friday, January 24, 2025 Theme: **Sun to Heliosphere over Time and Space, and Space Weather**

09:00 - 10:45	**Solar Active Regions and Eruptions, Chairperson: Hardi Peter**
09:00 - 09:25	Eruptive and Non-Eruptive Solar Active Regions: What Sets them Apart?, **Manolis Georgoulis**
09:25 - 09:40	Coronal Structure and Rotation Enforced by Nested Active Region Emergence: Near-Continuous Monitoring of an Active Nest with Solar Orbiter, **Adam Finley**
09:40 - 09:55	Global Coronal Magnetic Field Modelling to Study Solar Eruptive Events, **Prantika Bhowmick**
09:55 - 10:15	What Could Bridge the Gap Between Medium and Shorter-Term Solar Flare Prediction Methods?, **Mariana Korsos**
10:15 - 10:30	Reconstruction of Interplanetary Magnetic Field: A Novel Approach to Constrain the Solar Source Surface and Its Response to Solar Activity, **Shaonwita Pal**
10:30 - 10:45	Multiwavelength Study of Pre-flare Signatures using Aditya-L1, **Adithya H N**

10:45 - 11:20 **Posters/Coffee Break**

11:20 -12:30	**Extreme Events, Chairperson: Bhuwan Joshi**
11:20 - 11:45	Connecting Sun to Heliosphere Over Time and Space: Extreme Events, **Nat Gopalswamy**
11:45 - 12:00	A Study Of The May 10-11 Superstorm: Solar Sources And Technological Impacts, **Yoshita Barua**
12:00 - 12:15	Constraining CME Magnetic Flux in EUHFORIA Using Helicity Content: Case Study of the 10 March 2022 CME Observed by Solar Orbiter, **Shifana Koya**
12:15 - 12:30	Interplanetary Shocks at 1 AU: Automated Detection and Characterization Over Solar Cycles (1996–2023), **Wageesh Mishra**

12:30 - 14:00 **Lunch**

14:00 - 15:25	**Representative Results from New Heliospheric Missions, Chairperson: Piyali Chatterjee**
14:00 - 14:20	Recent Results on Solar Wind and Suprathermal Ions in the Interplanetary Medium and the Relevance of Aditya Solar Wind Particle Experiment (ASPEX) on-board Aditya-L1, **Dibyendu Chakraborty**
14:20 - 14:35	Multi-spacecraft Exploration of the Formation Stages of a Coronal Mass Ejection During a Composite Flare: Heating, Particle Acceleration, and Hot-channel Eruption, **Bhuwan Joshi**
14:35 - 14:55	Investigating the Possible Origin of Magnetic Switchbacks in the Low Solar Atmosphere, **Clara Froment**
14:55 - 15:10	The Coherent Morphology and Evolution of Solar Coronal Loops, **Bhinva Ram**
15:10 - 15:25	Polarization Characteristics of Active Solar Radio Emissions: Studies with SKAO Precursors and Pathfinders, **Soham Dey**

15:25 - 16:10 **Posters/Coffee Break**

16:10 - 17:40	**Radio Input to Heliospheric Studies and Space Weather, Chairperson: Nicole Vilmer**
16:10 - 16:35	Solar and Heliospheric Science from the New Generation Radio Telescopes: Status and Opportunities, **Divya Oberoi**
16:35 - 16:50	Bringing Together World's Best Radio Telescopes for Remote Sensing of Heliospheric Magnetic Field, **Devojyoti Kanasbanik**
16:50 - 17:10	Radio Eyes for the Sun, Heliosphere and Ionosphere: Status and plans for the LOFAR2.0 era., **Pietro Zucca**
17:10 - 17:25	The First Detailed Polarimetric Study of a Type-II Solar Radio Burst with the MWA, **Puja Majee**
17:25 - 17:40	Type II Radio Burst Without Coronal Mass Ejection, **Anshu Kumari**