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

08:30 - 09:30	**Inaugural Session**
09:30 - 10:45	**Long Term Synoptic Observations**
09:30 - 09:55	Exploring Solar Magnetism over Long Time Scales with Regular Full-disc Observations, **Ilaria Ermolli**
09:55 - 10:10	Revisiting Sunspot Groups Tilt Angle Study from Kodaikanal Data, **Manjunath Hegde**
10:10 - 10:30	Unveiling the Significance of Ca II K Observations for Long-Term Solar Irradiance Reconstructions, **Theodosios Chatzistergos**
10:30 - 10:45	Characteristics of Supergranulation Network from Kodaikanal Archival Data, **K. P. Raju**

10:45 - 11:15 **Posters/Coffee Break**

11:15 - 12:30	**Solar Interior Dynamics**
11:15 - 11:40	Helioseismology and Simulation Results, **Laurent Gizon**
11:40 - 11:55	A Unified Family of Mixed Inertial Modes in the Sun, **Rekha Jain**
11:55 - 12:15	Inertial Waves in the Solar Convection Zone, **Catherine Blume**
12:15 - 12:30	Study of Bipolar Magnetic Regions using AutoTAB: Support of Thin Flux Tube Model?, **Anu Sreedevi**

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

14:00 - 15:45	**Dynamo Models and Observations**
14:00 - 14:25	Nonlinearities, Stochasticity, and Long-term Modulations in Solar and Stellar Dynamos **Paul Charbonneau**
14:25 - 14:40	Deep Cyclic Activity and Radial Flux Transport in the Sun by Assimilating Observed Magnetogram in a 3D Dynamo Model, **Soumyadeep Chatterjee**
14:40 - 14:55	Surmounting the Solar Grand Minima: A Quantification of the Polar Flux Threshold, **Chitradeep Saha**
14:55 - 15:15	Observational Constraints for Dynamo Modeling & Active Region Flux Emergence Patterns**, Aimee Norton**
15:15 - 15:30	Statistical Properties of Solar Active Region Potential Magnetic Fields, **Stephane Regnier**

15:30 - 16:15 **Posters/Coffee Break**

16:15 - 17:35	**Solar Cycle Variations in the Interior**
16:15 - 16:40	Review of Helioseismology Results, **H. M. Antia**
16:40 - 16:55	Geostrophic Nature of Flows Around Active Regions and Changes in the Near-surface Shear Layer of the Sun, **S.P. Rajaguru**
16:55 - 17:15	Reconciling Helioseismic Measurements of Solar Deep Meridional Flow from SDO/HMI and GONG Observations. **Ruizhu Chen**
17:15 - 17:35	MHD Global Nonlinear MHD of Solar Tachocline and Implications for Surface Magnetism, **Mausumi Dikpati**

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

08:30 - 10:15	**High Resolution Observations of Solar Magnetic Fields**
08:30 - 08:55	A High Resolution View of Solar Magnetic Fields, **Jaime de la Cruz Rodriguez**
08:55 - 09:10	Magnetic Field and Plasma Diagnostics Using Infrared Spectral Lines: Forward Modeling, **Weihang Zhang**
09:10 - 09:25	Unravelling the Stratification of the Chromospheric Magnetic Field Using the Hα Line, **Harsh Mathur**
09:25 - 09:45	Solar Magnetic Fields Before and During Eruptions, **Maria Kazachenko**
09:45 - 10:00	High-resolution Measurements of Coronal Magnetic Field in Solar Flares and Associated Phenomena, **Gregory Fleishman**
10:00 - 10:15	Unveiling the Dynamics and Genesis of Small-scale Fine Structure Loops in the Lower Solar Atmosphere, **Annu Bura**

10:15 - 10:45 Posters/Coffee Break

10:45 - 12:15	**Solar Chromospheric Dynamics**
10:45 - 11:10	Solar Chromospheric Dynamics, **Bart De Pontieu**
11:10 - 11:25	Quiet-Sun Ellerman Bombs and Their Impact on the Upper Solar Atmosphere, **Jayant Joshi**
11:25 - 11:40	Simulations of the Solar Spicule Forest - Dependence on Magnetic Field Strength and Coronal Temperature, **Piyali Chatterjee**
11:40 - 12:00	Small-scale Swirls in the Solar Atmosphere, **Jiajia Liu**
12:00 - 12:15	Vortex Dynamics in Various Solar Magnetic Field Configurations, **Nitin Yadav**
12:15 - 12:30	Chromospheric and Coronal Heating in Active Regions: A Joint Perspective from Observations and Numerical Simulations, **Souvik Bose**

12:30 - 13:45 Lunch

13:45 - 15:25	**Waves in the Solar Atmosphere**
13:45 - 14:10	MHD Waves in the Solar Atmosphere: Recent Advances from High-resolution Observations, **Shahin Jafarzadeh**
14:10 - 14:25	Investigation of Umbral Wave Dynamics in the Chromospheric Resonator through Multi-Height Observations, **Kartika Sangal**
14:25 - 14:40	Shock Wave Propagation in the Solar Atmosphere, **Ravi Chaurasia**
14:40 - 15:05	Exploring Wave Coupling and Energy Dissipation in the Solar Atmosphere, **Elena Khomenko**
15:05 - 15:25	The Properties of Propagating Compressive Waves in a Multithermal Coronal Loop, **S. Krishna Prasad**

15:25 - 16:00 Posters/Coffee Break

16:00 - 17:50	**Instruments/Facilities and Science: New and Upcoming**
16:00 - 16:20	Parker Solar Probe: From Exploration to Paradigm Shifting Discoveries, **Nour Rawafi**
16:20 - 16:40	Scientific Achievements Based on Data from Solar Orbiter/EUI, **Hardi Peter**
16:40 - 17:00	Aditya - L1, **K. Sankarasubramanian**
17:00 - 17:15	Performance of the Upgraded GRIS@GREGOR Spectrograph, **Manuel Collados**
17:15 - 17:30	The Fabry-Pérot Imaging Spectropolarimeters for the European Solar Telescope, **Luis Bellot Rubio**
17:30 - 17:45	National Large Solar Telescope (NLST) of India, **B. Ravindra**

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

8:30 - 10:15	**Jets and Magnetic Reconnection**
08:30 - 08:55	Spicules and Jets in the solar Chromosphere: A Perspective of Recent Advances, **Tiago Pereira**
08:55 - 09:10	The Magnetic Origin of Solar Coronal Jets and Campfires: SDO and Solar Orbiter Observations, **Navdeep Panesar**
09:10 - 09:25	Transition Region Brightening in a Moss Region and their Relation with Lower Atmospheric Dynamics, **Tanmoy Samanta**
09:25 - 09:45	Small-scale Magnetic Flux Emergence Preceding a Chain of Energetic Solar Atmospheric Events, **Daniel Nóbrega-Siverio**
09:45 - 10:00	Campfires and Nanoflares: Signatures of finest-scale magnetic reconnection in quiet-Sun corona observed by Extreme Ultraviolet Imager aboard Solar Orbiter, **Nancy Narang**
10:00 - 10:15	Localized Heating and Dynamics in Coronal and Chromospheric Plasmas due to a Symbiosis of WAves and Reconnection (SWAR), **Abhishek Kumar Srivastava**

10:15 - 10:45 **Posters/Coffee Break**

10:45 - 12:15	**Flares and CMEs**
10:45 - 11:10	Origin and Energization of Solar Eruption Events, **Xin Cheng**
11:10 - 11:25	Low Coronal Disturbances and Coronal Mass Ejections, **Nariaki Nitta**
11:25 - 11:45	Solar Jets: Insights from High-Resolution Observations and Numerical Simulations, **Reetika Joshi**
11:45 - 12:00	Onset, Eruption, and Thermal Properties of Coronal Jets via MHD Simulation, **Sushree Sangeeta Nayak**
12:00 - 12:15	Small and Large Scale Episodic Events in Smaller and Larger Scale Numerical Simulations Spanning the Convection Zone to the Corona, **Viggo Hansteen**

12:15 - 13:45 **Lunch**

13:45 -15:00	**Shocks and Particle Acceleration and Transport in IP Medium**
13:45 - 14:10	Energetic Particle Acceleration and Transport: Interplanetary Coronal Mass Ejections and Shocks, **Olga Malandraki**
14:10 - 14:25	Connecting Energetic Electrons at the Sun and in the Heliosphere through X-ray and Radio Diagnostics, **Nicole Vilmer**
14:25 - 14:45	Suprathermal Ion Observations Associated with the Heliospheric Current Sheet Crossings by Parker Solar Probe, **Mihir Desai**
14:45 - 15:00	Time Evolution of Thermal and Non-thermal Energies in Solar Flares, **Soumya Roy**

15:00 - 15:30 **Posters/Coffee Break**

15:30 -16:30	**Instruments/Facilities and Science: New and Upcoming**
15:30 - 15:50	TBD
15:50 - 16:05	Solar Orbiter/EUI Observations and a Bifrost MHD Simulation of Fine-scale Dot-like Heating Events in Emerging Flux Regions, **Sanjiv Tiwari**
16:05 - 16:20	The Gauribidanur Radio Observatory: Current Status and Future Plans, **C. Kathiravan**
16:20 - 16:35	Investigations on suprathermal ions observed by ASPEX/STEPS on board Aditya-L1 during its earth-bound orbits, **Bijoy Dalal**

17:30 -18:30	**Evening Public Lecture - Vainu Bappu Memorial Lecture**

19:30 **Director's Dinner, IIA Campus.**

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

Venue: IIA Auditorium

9:00 - 10:35	**The Sun as a Prototype of Stellar Variability**
09:00 - 09:25	The Sun as a Prototype of Stellar Variability, **Sami K Solanki**
09:25 - 09:40	The Role of Meridional Flow in the Generation of Solar/Stellar Magnetic Fields and Cycles, **Vindhya Vashisht**
09:40 - 10:00	In situ Observation of Mass Ejections Caused by Magnetic Reconnections in the Ionosphere of Mars, **Yudong Ye**
10:00 - 10:15	Dynamics of Photospheric Magnetic Flux Distribution and Variations in Solar RVs: A Study Using HARPS-N Solar and SDO Observations, **Anisha Sen**

10:15 - 11:15 **Coffee Break**

11:15 - 12:15	**Asteroseismology**
11:15 - 11:40	Solar-like Stars: Seismology and Stellar Magnetic Activity, **Savita Mathur**
11:40 - 11:55	Latitudinal Differential Rotation in Red Giants, **Meenakshi Gaira**
11:55 - 12:15	Anomalous Rotators and New Evolutionary Pathways in Red Giants, **Shravan Hanasoge**

12:15 - 13:45 **Lunch**

13:45 - 15:30	**Solar/Stellar Dynamo and Activity**
13:45 - 14:10	Progress in Modelling Solar and Stellar Activity Cycles, **Alfio Bonanno**
14:10 - 14:25	Dynamo Modelling for Cycle Variability and Occurrence of Grand Minima in Sun-like Stars at Different Rotation Rates, **Bidya Binay Karak**
14:25 - 14:45	The Sun as a Proxy for Stellar Variability, **Nina-Elizabeth Nemec**
14:45 - 15:00	3D Radiative MHD Models of Cool Main-sequence Starspots, **Tanayveer Singh Bhatia**

15:00 - 16:00 **Coffee Break**

16:00 - 17:15	**Stellar Activity as a Limiting Factor for Charactersing Exoplanets**
16:00 - 16:25	Stellar Activity as a Limiting Factor for the Discovery and Characterisation of Exoplanets, **Ignasi Ribas** (IEEC, ICE, CSIC, Spain)
16:25 - 16:40	Magnetospheric Dynamics and Atmospheric Mass Loss driven by Solar-Stellar Winds and Storms, **Sakshi Gupta**
16:40 - 17:00	Magnetic Interaction of Stellar Coronal Mass Ejections with Close-in Exoplanets, **Gopal Hazra**

19:00 **Conference Dinner**

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

08:30 - 10:20	**Solar Active Regions and Eruptions**
08:30 - 08:55	Eruptive and Non-Eruptive Solar Active Regions: What Sets them Apart?, **Manolis Georgoulis**
08:55 - 09:10	Coronal Structure and Rotation Enforced by Nested Active Region Emergence: Near-Continuous Monitoring of an Active Nest with Solar Orbiter, **Adam Finley**
09:10 - 09:25	Global Coronal Magnetic Field Modelling to Study Solar Eruptive Events, **Prantika Bhowmick**
09:25 - 09:45	What Could Bridge the Gap Between Medium and Shorter-Term Solar Flare Prediction Methods?, **Mariana Korsos**
09:45 - 10:00	Reconstruction of Interplanetary Magnetic Field: A Novel Approach to Constrain the Solar Source Surface and Its Response to Solar Activity, **Shaonwita Pal**
10:00 - 10:15	Multiwavelength Study of Pre-flare Signatures using Aditya-L1, **Adithya H N**

10:15 - 11:00 **Posters/Coffee Break**

11:00 -12:15	**Extreme Events**
11:00 - 11:25	Connecting Sun to heliosphere over time and space: Extreme events, **Nat Gopalswamy**
11:25 - 11:40	A Study Of The May 10-11 Superstorm: Solar Sources And Technological Impacts, **Yoshita Barua**
11:40 - 12:00	Star-Planet Interactions: From Solar System Planets to Exoplanets, **Dibyendu Nandi**
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 - 15:45	**Radio Input to Heliospheric Studies and Space Weather**
14:00 - 14:25	Solar and Heliospheric Science from the New Generation Radio Telescopes: Status and Opportunities, **Divya Oberoi**
14:25 - 14:40	Bringing Together World's Best Radio Telescopes for Remote Sensing of Heliospheric Magnetic Field, **Devojyoti Kanasbanik**
14:40 - 15:00	Radio eyes for the Sun, Heliosphere and Ionosphere: Status and plans for the LOFAR2.0 era., **Pietro Zucca**
15:00 - 15:15	The First Detailed Polarimetric Study of a Type-II Solar Radio Burst with the MWA, **Puja Majee**
15:15 - 15:30	Type II Radio Burst Without Coronal Mass Ejection, **Anshu Kumari**

15:00 - 16:15 **Posters/Coffee Break**

16:15 - 17:40	**Representative Results from New Heliospheric Missions**
16:15 - 16:40	Investigating the Possible Origin of Magnetic Switchbacks in the Low Solar Atmosphere, **Clara Froment**
16:40 - 16:55	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**
16:55 - 17:10	The Coherent Morphology and Evolution of Solar Coronal Loops, **Bhinva Ram**
17:10 - 17:30	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**
17:30 - 17:45	Polarization Characteristics of Active Solar Radio Emissions: Studies with SKAO Precursors and Pathfinders, **Soham Dey**

16:15 - 17:40	**Representative Results from New Heliospheric Missions**
17:45 - 18:00	Closing Session — KSO specific screening/release of documents