

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



Invited Review

Invited

Contributed

Day 1: Monday, January 20, 2025Theme: **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	TBD, 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 - 15:30	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	Solar Cycle Variations in the Solar Interior, 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

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 H α 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 - 12:30	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 - 17:45	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

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 - 16:35	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 - 10:15	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 - 15:00	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 - 17:00	Stellar Activity as a Limiting Factor for Characterising 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 - 10:15	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 - 12:30	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 - 15:30	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
15:30 - 16:15	Posters/Coffee Break
16:15 - 17:45	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