

## FIRST PRIZE IN POSTER PRESENTATION

**Prabir Mitra** SRF, Udaipur Solar Observatory presented a poster entitled **Solar Physics: Importance, Current Understanding and 'Yet Unanswered' Problems** during the 31<sup>st</sup> Research Methodology Workshop on Physics and Electronics organized by the Knowledge Consortium of Gujarat, Department of Education, Government of Gujarat in Ahmedabad during November 18-24, 2019 and received first prize in the poster

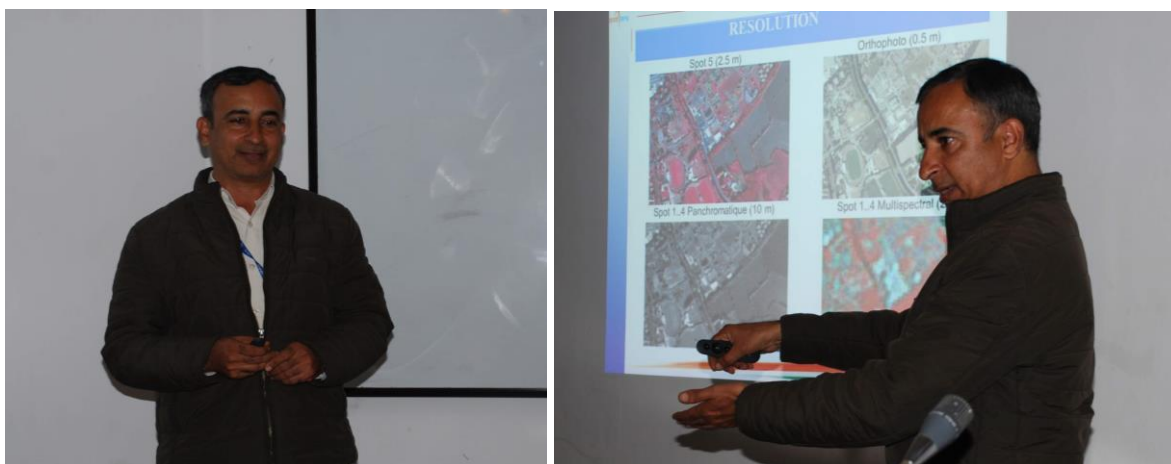


**Bhuwan Joshi**, Associate Professor, Udaipur Solar Observatory, PRL has been felicitated during the Youth Festival on 7<sup>th</sup> November 2019 in Almora, Uttarakhand organized by the Hindustan Times (HT) Media Group with active support from the Government of Uttarakhand for contributions in the field of Solar Physics and Space Sciences. The Chief Minister of Uttarakhand Mr. Trivendra Singh Rawat honored the awardees.



## VISIT OF DR. ANIL KUMAR, INDIAN INSTITUTE OF REMOTE SENSING

**Dr. Anil Kumar**, Scientist/Engineer 'SG' and Head PRSD at Indian Institute of Remote Sensing (IIRS), ISRO, Dehradun, gave a seminar entitled **Machine learning and its application in remote sensing data classification** at USO on 12<sup>th</sup> December 2019. His current research interests are in the area of Soft computing through Machine Learning for remote sensing temporal data processing, Digital Photogrammetry, GNSS and LiDAR.



# Preflare Processes, Flux Rope Activation, Large-scale Eruption, and Associated X-class Flare from the Active Region NOAA 11875

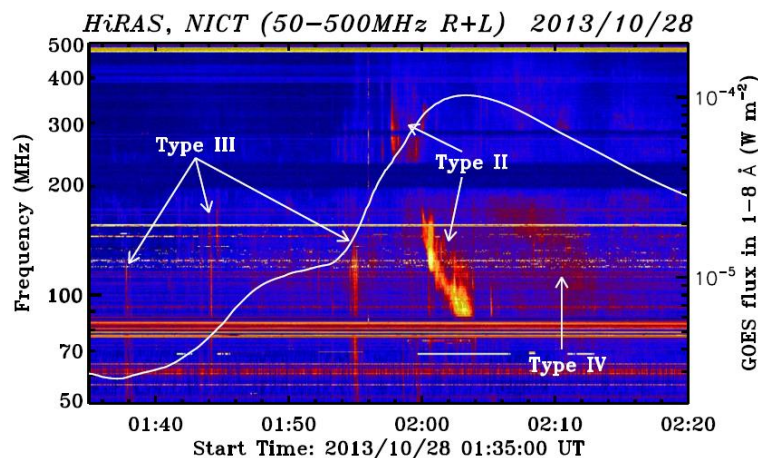
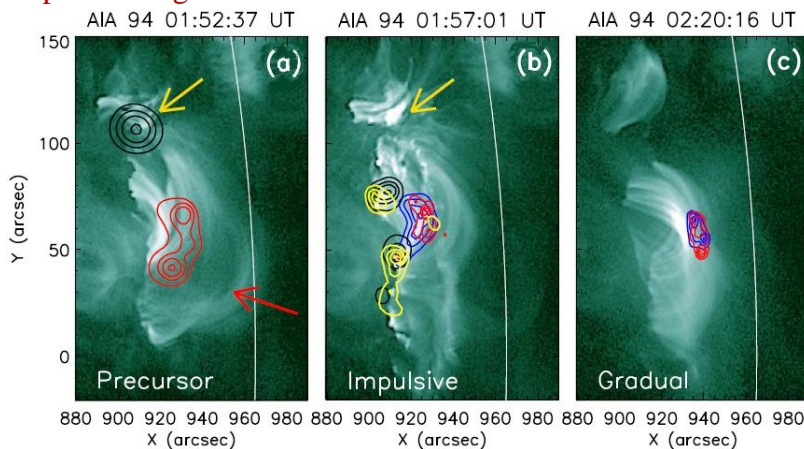
Prabir K. Mitra and Bhuwan Joshi



We present a multiwavelength analysis of the eruption of a hot coronal channel associated with an X1.0 flare (SOL2013-10-28T02:03) from the active region NOAA 11875. EUV images at high coronal temperatures indicated the presence of a hot channel (indicated by the red arrow in Figure 1) at the core of the active region from the early preflare phase evidencing the preexistence of a quasi-stable magnetic flux rope.

The hot channel underwent an activation phase after a localized and prolonged preflare event occurring adjacent to one of its footpoints (shown by the yellow arrows in Figure 1). Subsequently, the flux rope continued to rise slowly for  $\approx 16$  minutes during which soft X-ray flux gradually built-up characterizing a distinct precursor phase. The flux rope transitioned from the state of slow rise to the eruptive motion with the onset of the impulsive phase of the X1.0 flare. The eruptive expansion of the hot channel is accompanied by a series of type III radio bursts (Figure 2) in association with the impulsive rise of strong hard X-ray nonthermal emissions that included explicit hard X-ray sources of energies up to  $\approx 50$  keV from the coronal loops and  $\approx 100$  keV from their footpoint locations (see Figure 1). Our study contains evidence that preflare activity occurring within the spatial extent of a stable flux rope can destabilize it toward eruption. Solar eruptions are closely associated with metric and DH type II radio bursts. In this view, the CALLISTO spectrograph stationed at the USO/PRL campus is expected to provide useful information regarding solar eruptions.

<https://doi.org/10.3847/1538-4357/aaed26>



## VISIT OF PREVENTIVE MAINTENANCE TEAM FROM GONG PROGRAM, BOULDER, USA TO USO

The Udaipur Solar Observatory (USO) / Physical Research Laboratory has an MoU with the Global Oscillation Network Group (GONG) program of the National Solar Observatory, Association of Universities for Research in Astronomy, Boulder, USA. GONG comprises a six-site network of solar telescopes around the globe aimed at continuous observations of the Sun, with Udaipur being one of the observing sites that has been operational since October 1995. The telescope provides full-disk observations of the Sun in continuum intensity, photospheric Doppler and magnetic fields, and chromospheric H-alpha intensity. Recently, during the period 1 December – 12 December, 2019, a team of engineers comprising of Mr. Sang Nguyen (Electronics engineer) and Mr. Detrick Branston (Optics engineer) visited USO for the annual preventive maintenance of the GONG telescope. The scientists, engineers, and technical support personnel from USO, viz., Dr. Brajesh Kumar, Mr. Naresh Jain, Ms. Ramya Bireddy, Mr. Kushagra Upadhyay and Mr. Sudarshan Jain coordinated the maintenance work of the GONG telescope along with the team of engineers from GONG Program.



## VISIT OF STUDENTS AND FACULTY MEMBERS FROM RABINDRA NATH TAGORE COLLEGE, KAPASAN UDAIPUR

A group of 30 students pursuing B.Sc. at Rabindra Nath Tagore College, Kapasan, which is located in a remote area of Udaipur, visited USO on 29<sup>th</sup> November 2019 along with their faculty members. Prof. Nandita Srivastava, welcomed the group and briefly summarized the research activities at USO. This was followed by a talk on “Introduction to the Sun and Observational facilities at USO” by Mr. Hirdesh Kumar, SRF at USO. The talk remained quite interactive between the speaker and the students/faculty members visiting USO. Later, this group was shown the GONG and E-CALLISTO observational facilities of USO coordinated by Dr. Brajesh Kumar, Mr. Kushagra Upadhyay, Mr. Hirdesh Kumar, and Mr. Sudarshan Jain. The students and faculty members showed keen interest in understanding the principle and working of these instruments. The USO outreach team is privileged with this activity of sharing knowledge with such students, hailing from a remote location, which would create interest in their minds towards Space Science.

