



हिमाचल प्रदेश केंतीय विश्वविद्यालय

(NAAC-Accredited : A<sup>+</sup> with CGPA of 3.42)

## आन्तरिक गुणवत्ता आश्वासन प्रकोष्ठ

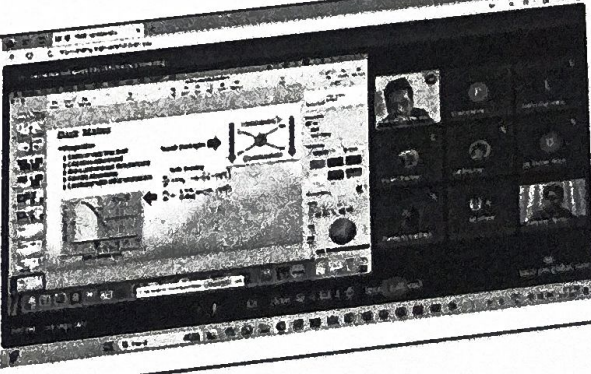
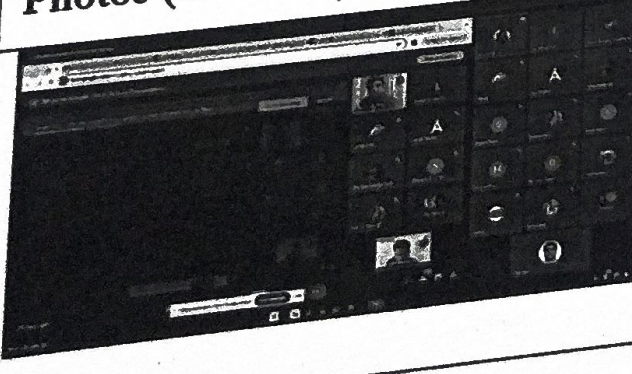
धर्मशाला-प्र.हि, जिला कांगड़ा, 176215



File No: M/S/S/2025/12/4/556

Dated: 20.01.2025

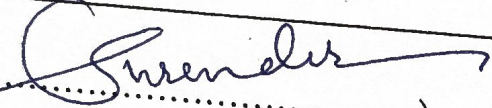
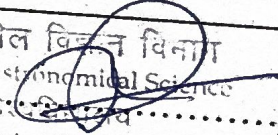
### Event Report

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|-------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name of the Event and type                            | Unveiling the Hidden Universe: Dark Matter, Neutrinos, and Other Mysteries, Online Seminar                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Objective of the event                                | To understand the landscape of matter-antimatter asymmetry and dark matter with a historical background shedding light on various experiments that provide solid evidence for the same. Further, to understand why the standard model of particle physics could not explain both matter-antimatter asymmetry and dark matter                                                                                                                                                                                                                                                                                                                                           |
| Date, Time and Venue                                  | 30 January 2025, 06:00 PM – 07:00 PM, Online Seminar                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Convener / Organising Secretary                       | Dr. Surender Verma                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Organising Unit                                       | NPRG@CUHP, Department of Physics and Astronomical Science                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Participants                                          | 37 participants.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Outcome of the event                                  | The speaker, Dr. Satyabrata Mahapatra (Post-Doctoral Fellow) from Sungkyunkwan University, Korea, an active researcher in the field gave the webinar talk titled "Unveiling the Hidden Universe: Dark Matter, Neutrinos, and Other Mysteries". The webinar was primarily organized for the master's degree and research degree students. The online participation was around 37. The speaker presented a beyond-standard model scenario that can simultaneously explain dark matter and matter-antimatter asymmetry. At the end of the talk, the audience actively participated in the question-and-answer session while the speaker answered the queries efficiently. |
| Expenditure & Funding Agency if anyone otherwise CUHP | None, Online International Conference                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Photos (atleast one geo-tag)                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

### Detail report of the Seminar

The NPRG@CUHP, Department of Physics and Astronomical Science (DPAS) under the guidance of head of department Prof. Rajesh Kumar, the cooperation of all faculty members and research scholars organized an online webinar shedding light on one of most fascinating parts of high energy physics i.e. neutrino physics. The speaker, **Dr. Satyabrata Mahapatra** (Post-Doctoral Fellow) from Sungkyunkwan University, Korea, was one of the active researchers in the concerned field. The speaker was reached out and communicated by Dr. Surender Verma to give the webinar talk titled "*Unveiling the Hidden Universe: Dark Matter, Neutrinos, and Other Mysteries*". It was organized on 30th January 2025 from 06:00 PM –07:00 PM (IST) with a gathering of participants online (speaker and some participants). The webinar was primarily organized for the master's degree and research degree students. The online participation was around 37.

The speaker was introduced to the audience by Dr. Surender Verma, Associate Professor at DPAS. Dr. Verma briefly introduced the importance of studying matter-antimatter asymmetry and explained the concept of dark matter, which is invisible matter. After the introduction, the speaker discussed the landscape of matter-antimatter asymmetry and dark matter with an interesting historical background and shed light on various experiments that provide solid evidence for the same. Further, he discussed why the standard model of particle physics could not explain both matter-antimatter asymmetry and dark matter, resulting in various beyond-standard model scenarios to account for both anomalies. After this, he discussed his research work and presented a beyond-standard model scenario. The scenario can simultaneously explain dark matter and matter-antimatter asymmetry. At the end of the talk, the audience actively participated in the question-and-answer session while the speaker answered the queries efficiently. The concluding remarks and vote of thanks was given by Mr. Labh Singh (research scholar, DPAS) highlighted the essence of webinar and its relevance for the master and early research degree students.

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| <p>(Sig. )<br/>Dr. Surender Verma<br/>Convener</p> | <p>विभागाध्यक्ष, भौतिकी एवं खगोल विज्ञान विभाग<br/>Head, Department of Physics &amp; Astronomical Science<br/>(Sig. )<br/>हिमाचल प्रदेश केन्द्रीय विश्वविद्यालय<br/>Central University of Himachal Pradesh<br/>शाहपुर परिसर, शाहपुर / Shahpur Parisar, Shahpur<br/>शाहपुर कांगडा (हि.प्र.) / Shahpur, Kangra (H.P.)<br/>Head/Director<br/>(With Stamp)</p> |
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DEPARTMENT OF PHYSICS AND ASTRONOMICAL SCIENCE  
CENTRAL UNIVERSITY OF HIMACHAL PRADESH  
AND

NPRG@CUHP  
ORGANIZING SEMINAR ON

UNVEILING THE HIDDEN UNIVERSE: DARK MATTER, NEUTRINOS,  
AND OTHER MYSTERIES

SPEAKER: SATYABRATA MAHAPATRA

POST-DOC FELLOW (SUNGKYUNKWAN UNIVERSITY, KOREA)

DATE: 30-01-2025

TIME: 06:00 PM

Google Meet Link: <https://meet.google.com/vzf-yxgw-qpy>