

---

**Report of Refresher course/FDP Cum Workshop on Recent Advances in Pure and Applied Physics Organized by Department of Physics & HRDC, Integral University, (14th October - 09th December 2023)**

1 message

---

**Communication Cell IUL** <communications@iul.ac.in>  
Bcc: pyfc@iul.ac.in

Sat, Feb 17, 2024 at 12:18 PM

**Report on**  
**Refresher course/FDP Cum Workshop**  
**on**  
**Recent Advances in Pure and Applied Physics**  
**Organized by**  
**Department of Physics & HRDC, Integral University, Lucknow**  
**(14<sup>th</sup> October - 09<sup>th</sup> December 2023)**

**REPORT**

The Department of Physics and Human Resource Development Centre, Integral University, Lucknow organized a five-day (equivalent to one week - 40 hours) Refresher course/FDP Cum Workshop on **“Recent Advances in Pure and Applied Physics”** between **14<sup>th</sup> October 2023 - 09<sup>th</sup> December 2023** in offline mode. This course aims to refresh and update the current knowledge of teachers and researchers to address the rapidly changing educational needs, and provides a platform for them to delve into the latest developments in physics. The primary goal of the refresher course was to disseminate knowledge on recent advancements in both pure and applied physics. The sessions covered a wide range of topics, including quantum mechanics, condensed matter physics, astrophysics, and applications in various interdisciplinary areas, offering a comprehensive program that included Lectures (02 hours), Interactive Discussions (0.5 hour), Literature Reviews (02 hours), Focused Discussion Forum Modules (0.5 hour), Quizzes (01 hour) and Assignments (02 hours). The course was made mandatory for the faculty members from the Department of Physics, whereas advisable/optional participation was sought from the Departments of Mathematics, Chemistry & Engineering. Eminent speakers from academia delivered lectures on their respective areas of expertise. Topics ranged from fundamental theories to emerging applications, providing a holistic view of the current state of physics. There was a mandatory requirement to submit a final assignment and quiz for successful completion of the course. Resource persons were invited from University of Lucknow, Aligarh Muslim University and Jamila Milia Islamia, New Delhi. The details of each session are as follows:

Session I

Date: 14<sup>th</sup> October 2023

Topic: “Synthesis of Thin and Thick Films by Various Methods”

The first session of the course was taken by **Prof. Rajesh Kumar Shukla**, Department of Physics University of Lucknow on 14<sup>th</sup> October 2023, 11: 30 am in Hall-3, Central Auditorium Complex. The session commenced after a formal introduction of the speaker. Prof. Shukla discussed the various thin film deposition techniques, and their applications and advantages in materials science and industry. Thin film deposition techniques are critical processes in electronics, optics, and coatings. They involve the deposition of a thin layer of material onto a substrate, which can have a significant impact on the properties and functionality of the resulting material. The key factors to select a thin film deposition

technique for a specific material or device fabrication, and to achieve the desired quality and functionality of the thin film. Around 43 participants attended this event.

#### Session II

Date: 28<sup>th</sup> October 2023

Topic: “Exoplanets, Titius-Bode Law in Astronomy, and a New Quantum Mechanics”

The second activity of the series was conducted on 28th October 2023 at 11: 30 am in Hall-3, Central Auditorium Complex. The eminent speaker was **Prof. Syed Afsar Abbas**, former Professor, Institute of Physics, Bhubaneswar, and Visiting Professor, Jamia Millia Islamia, New Delhi. Prof. Abbas, introduced and explained the concept of Titius-Bode Law which is an empirical mathematical relationship that attempts to predict the distances of planets in a solar system. The law was proposed in the 18<sup>th</sup> century and gained some popularity because it roughly matched the distances of most of the known planets at that time, including Mercury, Venus, Earth, Mars, Jupiter, and Saturn. Approximately 43 participants attended session II.

#### Session III

Date: 4<sup>th</sup> November 2023

Topic: “Transmission Electron Microscopy (TEM): A versatile tool for nanomaterials characterization”

The third activity of the Refresher course/FDP Cum Workshop was held on 4<sup>th</sup> November, 2023 at 10:30 am onwards in Room number D113, Academic Block-D. **Dr. Mohammad Wasi Khan**, Associate Professor, Department of Physics, Aligarh Muslim University was the expert on the occasion. The resource person demonstrated a versatile tool for nanomaterials characterization. The TEM offers superior resolution, magnification, and versatility for characterizing nanomaterials compared to other microscopy techniques. Its ability to probe nanoscale structures, internal features, and chemical composition makes it an indispensable tool for understanding the properties and behaviors of nanomaterials in various research fields, including materials science, nanotechnology and biology. This session was attended by 24 participants.

#### Session IV

Date: 2<sup>nd</sup> December 2023

Topic: “Gravitational Waves: The Wings of Space-Time”

The fourth session of the series was taken by **Prof. Murli Manohar Verma**, Department of Physics University of Lucknow on 2<sup>nd</sup> December, 2023 at 11:30 am in Room number D113, Academic Block-D. Prof. Verma shared the concept of Gravitational Waves and their detections. Gravitational waves are ripples in the fabric of spacetime that propagate at the speed of light, generated by certain movements of mass. They were first predicted by Albert Einstein in 1916 as a consequence of his general theory of relativity. It took almost a century for the first direct detection of gravitational waves, which was achieved by the Laser Interferometer Gravitational-Wave Observatory (LIGO) in 2015. **The 2017 Nobel Prize in Physics was given to Rainer Weiss, Barry C. Barish and Kip S. Thorne for Gravitational Wave detection.** Approximately 23 participants attended session IV.

#### Session V

Date: 9<sup>th</sup> December 2023

Topic: “Space Weather and Climate Change”

The last session of the series was conducted on 9th December 2023 at 11: 30 am in Room number D113, Academic Block-D. The resource person was **Prof. Ashok Kumar Singh**, Professor, Department of Physics, Dean, Faculty of Engineering and Technology, University of Lucknow. Prof. Ashok, explained

the time varying conditions in the near-Earth space environment that may affect space-borne or ground-based technological systems and may endanger human health or life are referred to as space weather. Space weather effects arise from the dynamic and highly variable conditions in the geospace environment starting from explosive events on the Sun (solar flares), Coronal Mass Ejections near the Sun in the interplanetary medium, and various energetic effects in the magnetosphere–ionosphere–atmosphere system. Approximately 17 participants attended this session.

All sessions were effectively coordinated by Dr. Mohd Shahalam, Dr. Salman Ahmad Warsi, Dr. Anuradha Shukla, Dr. Haroon & Miss Tahira Khatoun, and concluded with a vote of thanks by Prof. Shamoon Ahmad Siddiqui, Head, Department of Physics.

**Session wise Details:**

<b>Session</b>	<b>Date</b>	<b>Resource Person</b>	<b>Title</b>
<b>I</b>	14th October 2023	Prof. Rajesh Kumar Shukla Professor, Department of Physics University of Lucknow	Synthesis of Thin and Thick Films by Various Methods
<b>II</b>	28th October 2023	Prof. Syed Afsar Abbas Former Professor, Institute of Physics, Bhubaneswar, and Visiting Professor, Jamia Millia Islamia, New Delhi	Exoplanets, Titius-Bode Law in Astronomy, and a New Quantum Mechanics
<b>III</b>	4th November 2023	Dr. Mohammad Wasi Khan Associate Professor, Department of Physics, Aligarh Muslim University, Aligarh	Transmission Electron Microscopy (TEM): A versatile tool for nanomaterials characterization
<b>IV</b>	2nd December 2023	Prof. Murli Manohar Verma Professor, Department of Physics University of Lucknow	Gravitational waves: The wings of space-time
<b>V</b>	9th December 2023	Prof. Ashok Kumar Singh Professor, Department of Physics, Dean, Faculty of Engineering and Technology, University of Lucknow	Space Weather and Climate Change



Glimpses of Session I on 14<sup>th</sup> October 2023



Glimpses of Session II on 28<sup>th</sup> October 2023



Glimpses of Session III on 4<sup>th</sup> November 2023



Glimpses of Session IV on 2<sup>nd</sup> December 2023



Glimpses of Session V on 9<sup>th</sup> December 2023

Regards

Prof. Shamon Ahmad Siddiqui  
Professor and Head  
Department of Physics, Faculty of Science  
Integral University, Lucknow