Seminar

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Institute for Plasma Research

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Title: Development of advance coatings for UV and IR radiation absorption for potential applications in stray light suppression in optical system

Speaker: Dr. Mohit Aggarwal
Barkatullah University, Bhopal

Date: 16th May 2025 (Friday)

Time: 03.30 PM

Venue: Seminar Hall, IPR

Abstract

The development of UV and IR absorption coatings is critical for enhancing material durability and improving optical system performance. These multifunctional coatings are engineered to absorb ultraviolet and infrared radiation, reducing photodegradation, thermal stress, and stray light interference in sensitive applications. This work presents innovative formulations including polyurethane, inorganic, and fluoro-based coatings, each tailored for high UV resistance, thermal stability, and durability across varied substrates and operational environments. UV absorption Polyurethane Coatings are discussed in detail and the effect of carbon black, UV additive on emissivity is observed. A series of novel material formulations are presented. The coatings are designed to adhere to a wide range of substrates (e.g., Teflon, stainless steel) and withstand vacuum, thermal cycling, and harsh environments. These coatings are easy to apply on larger areas, complex surfaces, and are cost effective and durable. The potential applications of these coatings span from high-temperature industrial surfaces to stray light suppression in advanced optical and scientific instruments like space-borne Infrared systems & Infrared imaging systems, enabling improved longevity and performance through material innovation.