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AJAY KUMAR SINGH AWARDED PH.D. BY AMITY UNIVERSITY FOR ADVANCED APPLICATIONS OF NANOTECHNOLOGY

December 15, 2025 Arijit Bose



Post Views: 9

Lucknow: Er. Ajay Kumar Singh, retired Chief Engineer of Uttar Pradesh Rajya Vidyut Utpadan Nigam Limited, has been awarded the degree of Doctor of Philosophy (Ph.D.) by Amity University for his research on Advanced Applications of Nanotechnology in Road Construction. The research focuses on the practical, technical, and economic applications of nanotechnology in modern road construction engineering.

The research topic was conceptualized by Prof. (Dr.) Bharat Raj Singh, Director General (Technical), School of Management Sciences, Lucknow, who also served as the Co-Supervisor of the research. From Amity University, Prof. Ashita Kulshreshtha and Dr. Aniruddha Banerjee provided guidance as Supervisor and Co-Supervisor, respectively.

The research work presents a detailed analysis of advanced applications of nanomaterials in road construction engineering that are not yet widely implemented. It includes comprehensive calculations to determine the economically optimal quantity of nanomaterials required to enhance the strength and durability of concrete. The findings demonstrate the potential to improve structural performance without increasing overall costs.

In addition, the study introduces a novel technique for detecting corrosion in steel rebars used in reinforced concrete structures. This technique employs defect-layered one-dimensional (1D) binary, ternary, and quaternary photonic crystal–based displacement sensors. The research also proposes an advanced double-defect-layered 1-D quaternary photonic crystal structure, which is considered a significant contribution to the field of structural health monitoring.

This research represents a noteworthy achievement in advancing the practical and future-oriented applications of nanotechnology in the field of road and infrastructure development.

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