The Zenith

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Contents:

Organic crystals can serve as energy converters for emerging technologies

New research by a team of researchers at the NYU Abu Dhabi (NYUAD) Smart Materials Lab published today in the journal Nature Communications demonstrates that organic crystals, a new class of smart engineering materials, can serve as efficient and sustainable energy conversion materials for advanced technologies such as robotics and electronics.

While organic crystals were previously thought to be fragile, the NYUAD researchers have discovered that some organic crystals are mechanically very robust. They developed a material that establishes a new world record for its ability to switch between different shapes by expansion or contraction over half of its length, without losing its perfectly-ordered structure.

In the study titled "Exceptionally High Work Density of a Ferroelectric Dynamic Organic Crystal around Room Temperature" the team, led by NYUAD Professor of Chemistry Panče Naumov, presents the process of observing how the organic crystalline material reacted to different temperatures. The researchers found that the organic crystals were able to reversibly change shape in a similar manner to plastics and rubber. Specifically, this material could expand and contract over half of its length (51 percent) repeatedly, over thousands of cycles, without any deterioration. It was also able to both expand and contract at room temperature, as opposed to other materials that require a higher temperature to transform, creating higher energy costs for operation.

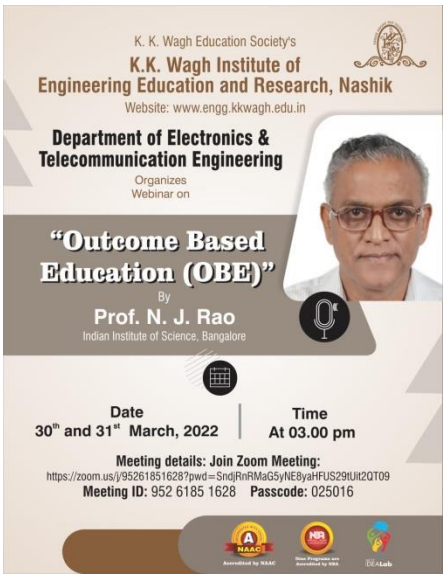
Unlike traditional materials that are silicon- or silica-based, and inevitably stiff, heavy and brittle, the materials that will be used for future electronics will be soft and organic in nature. These advanced technologies require materials that are lightweight, resilient to damage, efficient in performance, and also have added qualities such as mechanical flexibility and ability to operate sustainably, with minimal consumption of energy. The results of this study have demonstrated, for the first time, that certain organic crystalline materials meet the needs of these technologies, and can be used in applications such as soft robotics, artificial muscles, organic optics, and organic electronics (electronics created solely from organic materials).

"This latest discovery from the Smart Materials Lab at NYUAD builds on a series of our previous discoveries about the untapped potential of this new class of materials, which includes adaptive crystals, self-healing crystals, and organic crystalline materials with shape memory," said Naumov. "Our work has shown that organic crystals can not only meet the needs of the emerging technologies, but in some cases can also surpass the levels of efficiency and sustainability of other, more common materials."

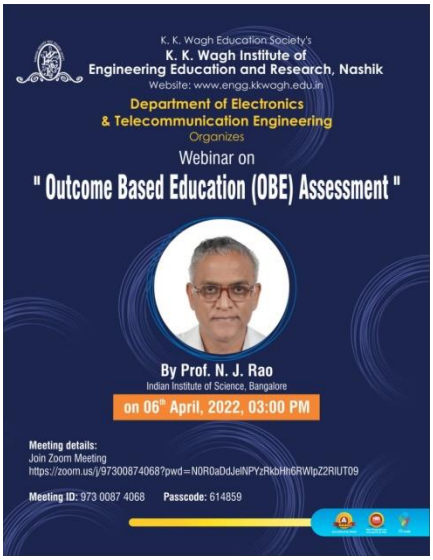
Expert Lecture/Seminars/Courses/Industrial Visits Organized

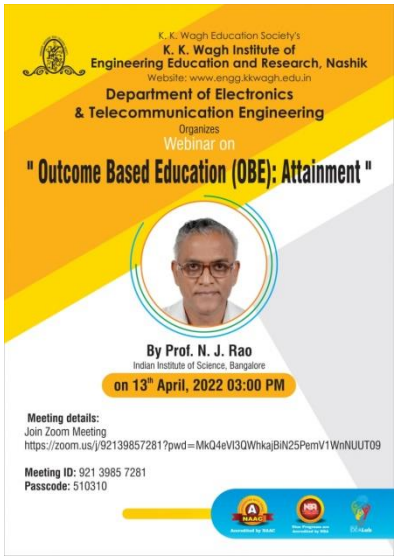
- Department of Electronics and Telecommunication Engineering organized webinar on “An Overview of the Embedded Development Ecosystem” by Mr. Joseph Mathew, Scientist E, Control & Instrumentation Group, C-DAC, Trivandrum, Technical Architect, Atgeir Solutions Pvt. Ltd. Pune on 15th March 2022.
- Department of Electronics and Telecommunication Engineering of K.K.Wagh Institute of Engineering Education and Research Nashik, Students’ Association of Electronics Engineers (SAEE) in collaboration with IETE Nashik subcenter organized webinar on “The Era of Cloud Computing” by Mr. Vipul Bramhankar, Technical Architect, Atgeir Solutions Pvt. Ltd. Pune on 16th March 2022

- Department of Electronics and Telecommunication Engineering of K. K. Wagh Institute of Engineering Education and Research Nashik organized webinar on "Outcome based Education (OBE)” by Prof. N. J. Rao, IISC, Bangalore on 30st and 31st march 2022.

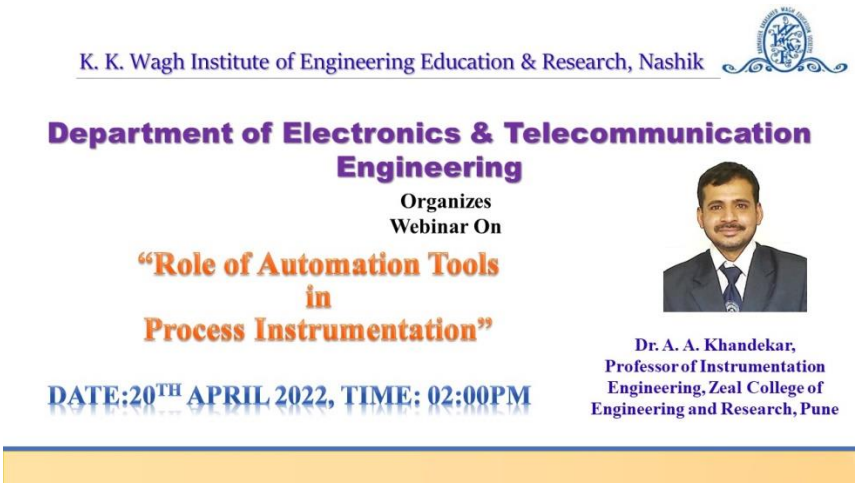


- Department of Electronics and Telecommunication Engineering of K. K. Wagh Institute of Engineering Education and Research Nashik organized webinars on "Outcome based Education (OBE): Assessment" and "Outcome based Education (OBE): Attainment" by Prof. N. J. Rao, IISC, Bangalore on 6th and 13th April 2022.

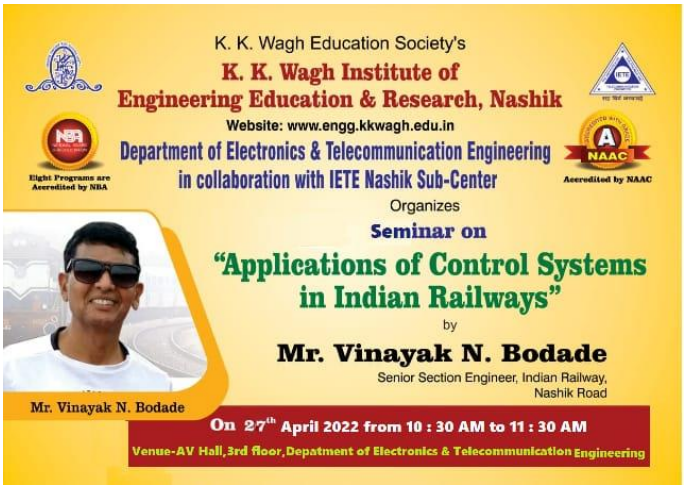




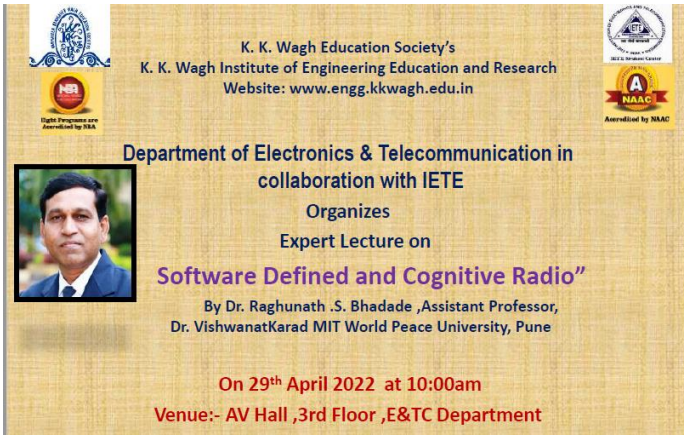
- A webinar was organized on "Role of Automation Tools in Process Instrumentation" by Dr. A. A. Khandekar, Professor of Instrumentation Engineering, Zeal College of Engineering and Research on13th April 2022.



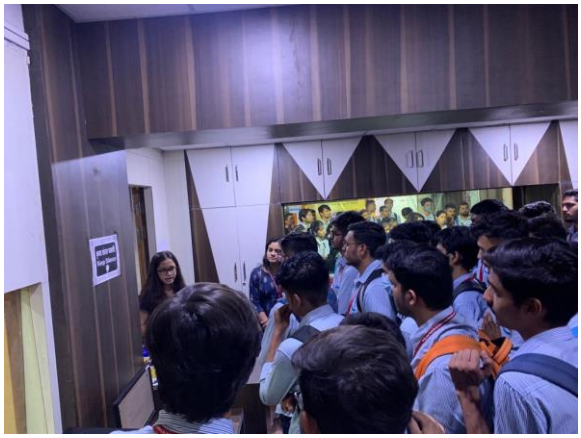
- A webinar was organized on "Application of Control Systems in Indian Railways" by Mr. Vinayak N. Bodade, Sr. Section Engineer, Indian Railways, Nashik on 27th April 2022.



- A webinar was organized on " Software Defined and Cognitive Radio" by Dr. Raghunath S. Bhadade, Assistant Professor, MIT-WPU, Pune on 29th April 2022.



- Industrial visit was organized to “Radio Vishwas” for SE students on 21st April 2022.



- Industrial visit was organized to “Solar Plant” for TE students on 25st April 2022.


Industrial Training / Seminar/Workshop done by Staff

- Mrs. K. Nirmalakumari has completed coursera course on “Introduction to Microsoft Excel”.

Published By

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Vision

Provide quality education to create engineering professionals of global standards by keeping pace with rapidly changing technologies to serve the society.

Mission

M1: To educate the students with the state-of-the-art technologies and value based education to meet the growing challenges of industry.

M2: To provide scholarly ambience & environment for creating competent professionals.

M3: To inculcate awareness towards societal needs.