

“4D Biomaterials: Beyond three dimensions”

The Department of Physics has organized a guest lecture entitled “4D Biomaterials: Beyond three dimensions”, by Dr Amit Nain, Faculty, IISc Bangalore India.

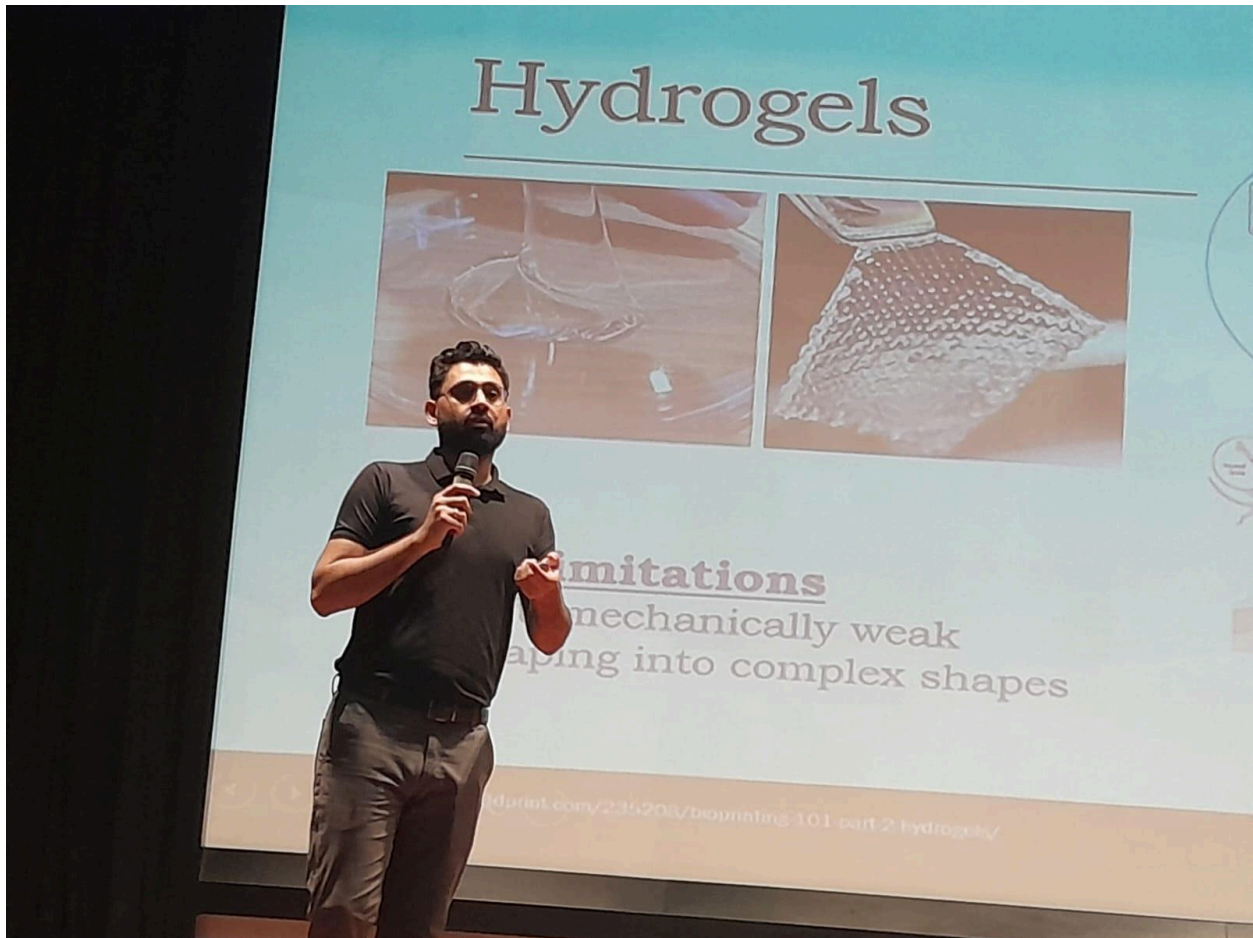
The event was conducted on 20.05.2024 in the MVJCE auditorium. The students were assembled in the auditorium by 09.45 am and the event started around 10.00 am and ended at 12.30 pm. Approximately 500 students of Physics cycle attended the guest lecture.

4D biomaterials are an intriguing advancement in the field of biomaterials science. While traditional biomaterials focus on properties in three dimensions (3D), 4D biomaterials add the dimension of time, enabling them to change their structure or properties in response to external stimuli. This capability opens up exciting possibilities for applications in biomedicine, tissue engineering, drug delivery, and beyond.



Definition of Biomaterial

A biomaterial is a nonviable material used in a medical device intended to interact with biological systems - David F. Williams, 1987



The "fourth dimension" in 4D biomaterials typically refers to the ability of the material to undergo dynamic changes in response to various stimuli such as pH, temperature, light, or specific biological signals. These changes can include alterations in shape, stiffness, porosity, or the release of encapsulated therapeutic agents.

One of the key advantages of 4D biomaterials is their potential to mimic the dynamic behavior of living tissues. For example, a 4D scaffold could be designed to gradually degrade over time as new tissue forms, providing mechanical support initially and then gradually disappearing as the tissue matures.

In tissue engineering, 4D biomaterials hold promise for creating scaffolds that can adapt to changing cellular environments, guiding tissue growth and regeneration more effectively than static materials. They can also be used to develop smart drug delivery systems that release therapeutic agents in response to specific biological cues, leading to more targeted and controlled treatments.







Students interacted with DR Amit Nain and cleared doubts.

Then Dr Sathish presented a memento to honour the guest, and concluded the guest lecture with vote of thanks.



Outcome of the Event

The participants had a good opportunity to identify and enhance their knowledge in the field of biomaterials and are motivated to learn more on the applications of biomaterials.