

SHAPES MATERIALS. DRIVES INNOVATION.

Dr. Balakrishnan Shankar 's work at the intersection of advanced materials, flexible electronics, biomaterials and sustainable technologies is creating solutions for the future of engineering, energy, healthcare and society



Dr. Balakrishnan Shankar

Dean, School of Engineering
Professor & Chairperson of Mechanical Engineering
Director, Center for Flexible Electronics and Advanced Materials

 Joined in Amrita 2006

 Amritapuri Campus



MATERIAL SCIENTIST

Advancing functional & Smart materials for next generation applications



RESEARCH LEADER

Leading multidisciplinary research initiatives across engineering domains



GLOBAL COLLABORATOR

Partnering with universities, industries and research centers world wide



INNOVATOR

Transforming ideas into technologies, patents and impactful solutions



EDUCATION ARCHITECT

Building future ready engineers and researchers

THE RESEARCH HISTORY



CURIOSITY

A passion for understanding how materials behave at microscopic and functional levels



INDUSTRY PRERSPECTIVE

Seven years at Applied Materials, California, working with cutting edge technologies and industrial innovation



ACADEMIC EXCELLENCE

Joined Amrita in 2006 and established strong research ecosystems across engineering disciplines



INNOVATION JOURNEY

Research translated into publications, patents, collaborations, and emerging technologies



LEADERSHIP IMPACT

Driving the growth of engineering education, interdisciplinary research and global partnerships

KEY RESEARCH CONTRIBUTIONS

- Advanced functional Materials for engineering applications
- Electronic and magnetic material systems
- Flexible and wearable electronics
- Hydrogen storage and sustainable energy materials
- Electromagnetic shielding technologies
- Biomaterial for healthcare applications
- Emerging 2D materials research

RESEARCH DOMAINS INS



Advanced Materials



Electronic Materials



Magnetic Materials



2D Materials



Flexible Materials



Hydrogen Storage



Electro-magnetic Shielding



Biomaterials

IMPACT BY NUMBERS



92
Publications



1117
Citations



6
Patents



16
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1
Grant

SIGNATURE RESEARCH THEMES



Smart Materials & Functional Coating

Materials designed for high performance engineering systems



Flexible Electronics

Wearable and adaptive technologies



Sustainable Energy Materials

Hydrogen Storage and energy related innovations



Biomaterials

Advanced Materials for helathcare and medical applications

GLOBAL RESEARCH ECOSYSTEM



-  Northern Illinois University, USA
-  Universitat Politècnica de Catalunya - BarcelonaTech (UPC)
-  Uppsala University, Sweden
-  University of Texas at Austin, USA
-  IFW, Dresden, Germany
-  Amrita Vishwa Vidyapeetham, India
-  Industry & Academic Partners Worldwide

“ My vision is to advance materials science and engineering innovations that enable sustainable technologies, produce devices and impactful solutions in healthcare & energy, inspired by Amma's vision of compassion-driven research. ”



TOP RATED PUBLICATIONS



01



[A low-power biomimetic collision detector based on an in-memory molybdenum disulfide photodetector](#)

02



[Antiviral properties of copper and its alloys to inactivate covid-19 virus: a review.](#)

03



[Impact of remote experimentation, interactivity and platform effectiveness on laboratory learning outcomes.](#)

04



[Proposed auxetic cluster designs for lightweight structural beams with improved load bearing capacity.](#)

05



[Magnetic Properties of Copper Doped Nickel Ferrite Nanoparticles Synthesized by Co Precipitation Method](#)



PATENTS

2024 - [Auxetic Member for Load Bearing Structures](#)

2023 - [Modular Configurable Linear Actuator Under Thermal Load](#)

2021 - [Optimized Engineering Structures With Auxetic Cells](#)

2021 - [An Auxetic Member for Load Bearing Structures](#)

2021 - [Optimized Engineering Structures With Auxetic Cells](#)

2010 - [Chakshayaan](#)



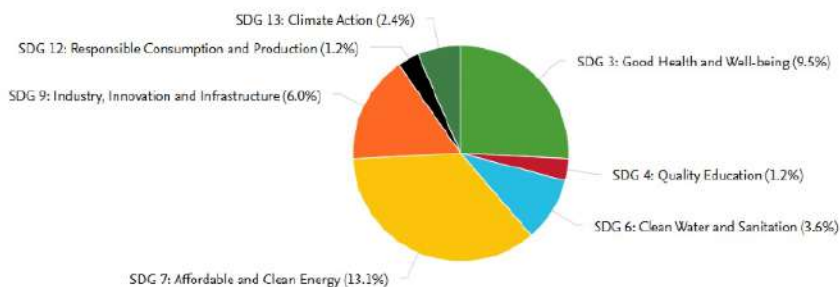
ONGOING PROJECTS

- Structural health monitoring
- Wireless strain sensing.
- RF-based sensing systems.
- Crack detection in composites.
- Adaptable extensometers.
- Flexible sensors.
- Thin Films Electro Magnetic Shield
- 2D materials Hydrogen Storage
- Magnetically active metal organic frameworks- Bio Medical App
- Microfluidic sensors.
- Microwave imaging for tumor detection.
- Hyperthermia treatment systems.
- Energy harvesting devices.
- Self-powered sensing systems.
- Fuel cells and hydrogen technologies
- Microwave sintering of composite materials
- Silicon rubber composites for EMP and radar absorption
- Addictive manufacturing glucose sensing hydrogen
- Solid State Hydrogen Storage



SUSTAINABLE DEVELOPMENT GOALS

Distribution Overview



Advancing Knowledge



Driving Innovation



Creating Impact

