Nanotechnology

Unlocking the Potential of the Microscopic World



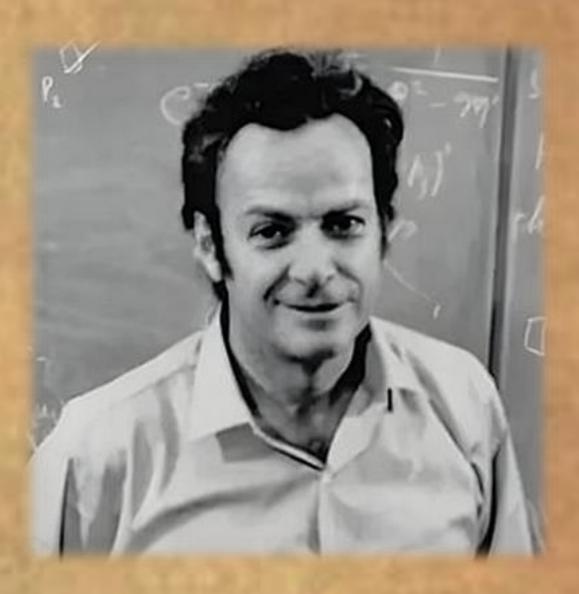
American International University-Bangladesh

Where leaders are created

FACULTY OF SCIENCE & TECHNOLOGY

NAME OF THE STUDENT

Farha, Nabilah Mubin, Abdullah Al Barua, Diganta Hasan, Mahmodul Mahmud, Syed Al •Early Developments: In 1959, physicist Richard Feynman's lecture titled "There's Plenty of Room at the Bottom" laid the conceptual foundation for nanotechnology. His vision of manipulating and controlling matter at the atomic scale sparked interest in the field. I Gerd Binnig and Heinrich Rohrer developed the scanning tunneling microscope (STM), allowing scientists to visualize and manipulate individual atoms, leading to significant advancements in nanotechnology research

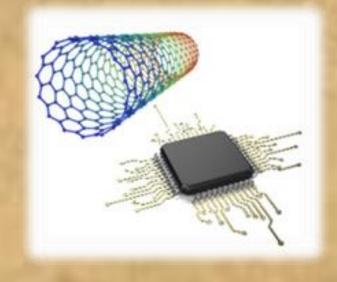


RICHARD FEYNMAN 1918-1988

APPLICATIONS OF NANOTECHNOLOGY

1. ELECTRONICS AND COMPUTING:

Nanoelectronics: Shrinks devices, improves circuit efficiency. For example, carbon nanotubes are being used to create transistors that are much smaller and more efficient than traditional silicon transistors





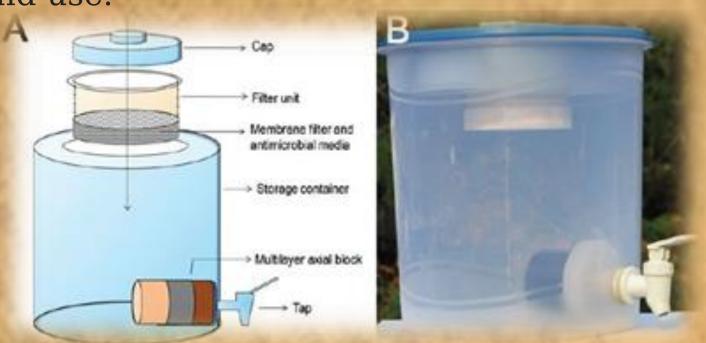
Flexible electronics:
flexible electronics are
being used to create
wearable devices such as
smartwatches and fitness
trackers

Quantum computing: Revolutionizes information processing. Quantum computers could be used to solve problems that are currently intractable for traditional computers.



2.ENERGY AND ENVIRONMENT

Nanomaterials for water purification and desalination. Nanomaterials can be used to remove contaminants from water, making it safe to drink and use.



Advancements in energy storage using high-capacity batteries and supercapacitors. Nanomaterials can be used to create batteries and supercapacitors that store more energy and have longer lifetimes.





Nanotechnology enhances solar cell efficiency. Nanoparticles can be used to improve the absorption of sunlight in solar cells, leading to increased efficiency.

Nano sensors enable

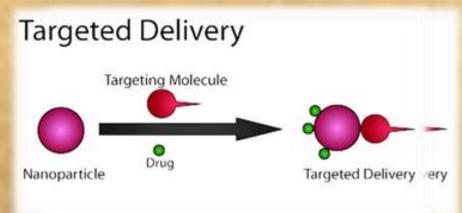
in diagnostics. Nano

early disease detection

3. MEDICINE AND HEALTHCARE

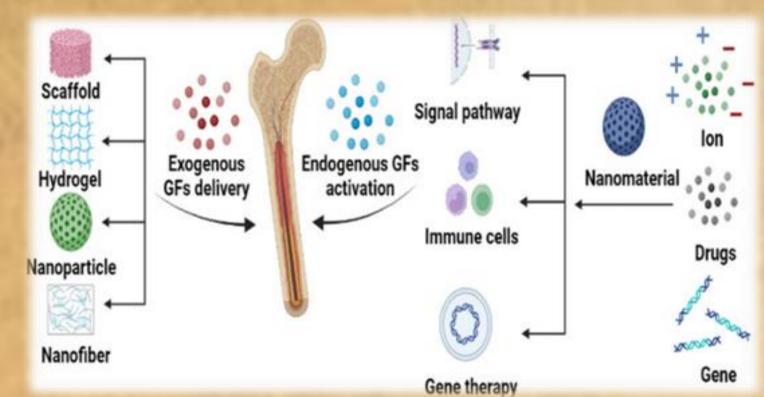
Nanotechnology enables targeted drug delivery for improved therapy. Nanoparticles can be used to deliver drugs directly to target cells, reducing side effects and improving efficacy.

sensors can be used to detect diseases at an early stage when they are easier to treat.

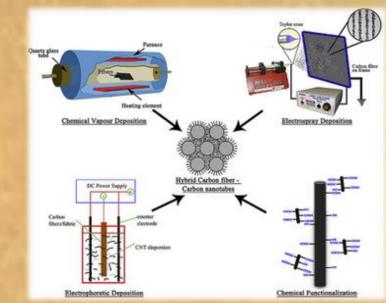


2) Nanosensor cleavage by proteases at the tumor site

Nanomaterials facilitate tissue engineering and organ repair. Nanomaterials can be used to create scaffolds that support the growth of new tissue, leading to the repair or regeneration of damaged organs.



4.MATERIALS AND MANUFACTURING:



Nanocomposites and nanofibers provide strength and lightness in materials. Nanocomposites are made by combining nanomaterials with traditional materials, resulting in materials that are stronger, lighter, and more durable.

Nano-Coating H2O Water drop takes up dirt particles Nano-Coated Surface

Nanocoating's create self-cleaning surfaces. Nanocoating's can be used to create surfaces that are self-cleaning, repelling dirt, water, and other contaminants.



3D printing achieves nanoscale precision and intricate structures. 3D printing can be used to create structures with nanoscale precision, opening up new possibilities for manufacturing.

PRESENT-DAY APPLICATIONS



Nanotechnology's widespread applications revolutionize various industries. Electronics benefit from nanoscale components, enabling smaller and efficient devices. Energy sees improved solar cells and energy storage with nanomaterials. Healthcare benefits from targeted drug delivery and nano sensors for advanced treatments and diagnostics. Materials and manufacturing benefit from enhanced properties through nanocomposites and nanocoatings, while 3D printing allows precise and intricate structures.

FUTURE PROSPECTS AND CHALLENGES







Nanotechnology in space exploration offers promise in lightweight materials, sensors, and propulsion for efficient missions. However, careful consideration of environmental, safety, and ethical aspects is vital to manage risks like nanotoxicity and privacy concerns. Collaborative research among scientists, engineers, policymakers, and stakeholders is crucial to maximize nanotechnology's potential while ensuring responsible development.

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CONCLUSION

NANOTECHNOLOGY HAS REVOLUTIONIZED INDUSTRIES SUCH AS ELECTRONICS, ENERGY, HEALTHCARE, AND MATERIALS. ITS POTENTIAL FOR SHAPING A BETTER FUTURE IS IMMENSE, ADDRESSING GLOBAL CHALLENGES AND OFFERING INNOVATIVE SOLUTIONS. FURTHER EXPLORATION AND RESPONSIBLE DEVELOPMENT ARE KEY TO UNLOCKING ITS FULL POTENTIAL WHILE CONSIDERING ENVIRONMENTAL, SAFETY, AND ETHICAL ASPECTS.