WIE GAZETTE

WOMEN • TECHNOLOGY • INSPIRATION • EMPOWERMENT

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THEME- NANOTECHNOLOGY

Nanotechnology is the study of particles- molecules, atoms, and sub atoms at the nanoscale (10^-9 metres- represented by nm). On a scale of comparison, human hair is about 80 000 nm. Nanoparticles are broadly classified into 0D (general nanoparticles), 1D(nanorod), 2D(nanofilm), and 3D(bulk powder)

GLOSSARY

1. **Bottom-up**
   Also called self-assembly, larger objects are constructed using smaller units (atoms, molecules, etc.). It is a representation of biological systems that create clusters of atoms or molecules using chemical covalent bonds.

2. **Positional synthesis**
   It is the controlling of chemical reactions by the careful positioning of the reactive molecules.

3. **Photolithography**
   It is an optical microfabrication process that uses light to etch patterns on thin film or the bulk of a substrate (i.e. wafers) using a light-sensitive resin. This is used in the making of integrated circuits.

4. **Fullerenes**
   They are an allotrope of carbon, spherical. They consist of carbon atoms that are interconnected by single and double bonds to form closed meshes.

5. **Molecular recognition**
   It is the operation where molecules adhere in a certain form to generate a larger structure and is useful in the processes of nanotechnology.

6. **Single-walled carbon nanotubes (SWNTs)**
   They are long and hollow tubes made out of a singular sheet of carbon atoms arranged in a honeycomb lattice, using the plasma arcing method of carbonaceous material (graphite in particular).

7. **Multi-walled carbon nanotubes (MWNTs)**
   They are like SWNTs, but made of multiple layers of graphene, concentrically formed using the plasma arcing method of graphene. They are highly conductive and their diameters can be up to 30 nm in comparison with 0.7-2.0 nm for standard SWNTs.

8. **Nanoelectronics**
   Engineered electronic components on a nanometer scale using the processes of nanotechnology are nanoelectronics. They include both molecular electronics and nanoscale devices like solar cells and supercapacitors.

9. **Proximal probes**
   They are instruments that are vital in the field of nanotechnology and are utilized for precise positional control and sensing. One of their applications includes scanning tunneling and atomic force microscopes.

10. **Scanning tunneling microscope**
    It is a device that scans a sharp metal tip over a conducting surface and images the surface to atomic accuracy by applying an electrical voltage. Pinning molecules to surfaces is another function of the scanning tunneling microscope.

HEADLINES

1. In laboratory tests, researchers at the University of Illinois Chicago were able to identify the SARS-CoV-2 virus using graphene, one of the strongest and thinnest known materials. The discovery, according to the researchers, may be a game-changer in coronavirus identification, with applications in the battle against COVID-19 and its variations.

2. The presence of nanoscale metallic particles in the human brain has been discovered in a study. A multinational research team led by the United Kingdom has discovered elemental metallic iron and copper in the human brain for the first time.

3. Tel Aviv University researchers created a unique nanotechnology that converts a transparent calcite nanoparticle into a gleaming gold-like particle for the first time in the world. They transformed the translucent particle into a visible particle despite its small size. The new material, according to the researchers, can be used as a basis for novel cancer treatments.

4. Using a sheet of graphene to record an optical image—almost like a video camera—of the weak electric fields created by the repetitive firing of the heart's muscle cells, Bay Area scientists have caught the real-time electrical activity of a beating heart. The graphene camera is a novel form of sensor that may be used to investigate electrically generating cells and tissues, such as clusters of neurons or cardiac muscle cells.

5. Immune cell-mimicking nanoparticles that target inflammation in the lungs and deliver medicines exactly where they're required have been produced by nanoengineers. The researchers loaded the nanoparticles with the medication dexamethasone and gave them to animals with inflamed lung tissue as a proof of concept. Inflammation was totally cured in mice fed nanoparticles at a medication concentration when traditional delivery techniques failed.

TIMELINE

- **4th Centuries:** Early examples of nanostructured material such as the Lycurgus Cup, an example of dichroic glass, belong to this time period.
- **9th-17th Centuries:** premodern examples such as:
    - Vibrant stained glass windows whose rich colours were due to the use of gold chloride, and other metal oxides and chlorides.
    - Gold nanoparticles were used as photocatalytic air purifiers.
    - Use of 'lustre' ceramic glazes, which contained metallic nanomaterial.
    - “Damascus” saber blades, which contained cementite nanowires and carbon nanotubes.
- **1827:** Use of silver nanoparticles, which are sensitive to light, for photography.
- **1857:** Discovery of gold colloids by Michael Faraday.
- **1931**: Creation of the first electron microscope by The German scientists Max Knott and Ernst Ruska
- **1936:** Invention of the field emission microscope by Erwin Müller.
- **1947** – Discovery of the transistor by John Bardeen, Walter Brattain, and William Shockley.
- **1950:** The theory and process for growing monodisperse colloidal materials was provided by Victor La Mer and Robert Dinegar
- **1951**: Erwin Müller pioneered the field ion microscope**.**
- **1956:** Arthur von Hippel coined the term-“molecular engineering”**.**
- **1958:** the first integrated circuit was built by Jack Kilby of Texas Instruments.
- **1959:** Richard Feynman of the California Institute of Technology gave the lecture, "There's Plenty of Room at the Bottom: An Invitation to Enter a New Field of Physics" at an American Physical Society meeting at Caltech.
- **1965:** Moore's law was introduced.
- **1974:** the term 'nanotechnology' was coined by Tokyo Science University Professor Norio Taniguchi
- **1981:** At IBM’s Zurich lab, Gerd Binnig and Heinrich Rohrer invented the scanning tunneling microscope. Also, Nanocrystalline, semiconducting quantum dots in a glass matrix were discovered by Russia’s Alexei Ekimov.
- **1985:** The Buckminsterfullerene (C60), more commonly known as the buckyball**,** was discovered by Rice University researchers Harold Kroto, Sean O’Brien, Robert Curl, and Richard Smalley.
- **1985:** Louis Brus of Bell Labs developed colloidal semiconductor nanocrystals (quantum dots)
- **1986:** Christoph Gerber, Calvin Quate, and Gerd Binnig created the atomic force microscope.
- **The 1990s:** Early nanotechnology companies began to operate, e.g., Nanophase Technologies, Helix Energy Solutions Group, Zyvex, Nano-Tex.
- **1992:** nanostructured catalytic materials MCM-41 and MCM-48 were discovered by C.T. Kresge and colleagues at Mobil Oil.
- **1993:** a method for controlled synthesis of nanocrystals (quantum dots) was invented by Moungi Bawendi of MIT.
- **1998:** The establishment of the Interagency Working Group on Nanotechnology (IWGN).
- **1999:** At Northwestern University, dip-pen nanolithography was created by Chad Mirkin.
- **2003**: gold nanoshells were developed by Rebekah Drezek, Naomi Halas, Renata Pasqualin, and Jennifer West at Rice University.
- **2004 –** The first college-level education program in nanotechnology was launched by SUNY Albany, United States.
- **2006 –** A nanoscale car was built by James Tour and colleagues at Rice University.
- **2007:** using a virus that is not harmful to humans, a lithium-ion battery was built by Angela Belcher and colleagues at MIT
- **2008:** The first publication of NNI Strategy for Nanotechnology-Related Environmental, Health, and Safety (EHS) Research.
- **2009:** several DNA-like robotic nanoscale assembly devices were created by Nadrian Seeman and colleagues at New York University.
- **2013:** The first carbon nanotube computer was developed by Stanford researchers
- **2015-2021:** Nanotechnology is being used in a variety of fields like medical, electronics, etc to improve the current resource and make processes efficient and more accurate. Some of the current projects include:
    - New drug-formulation method leading to smaller pills
    - lighting hydrogels via nanomaterials
    - Development of nanomedicines
    - Use of nanopillar in solar cells
    - incorporation of semiconductor nanoparticles in display technology, lighting, and biological imaging

BLOG

Dr. Mildred Dresselhaus

Also known as the Queen of Carbon Science, Dr. Mildred Dresselhaus was a pioneering scientist in the field of nanotechnology, specializing in the area of carbon nanotubes, and was a well-known professor at the Massachusetts Institute of Technology (MIT). She was born in Brooklyn, New York City on November 11TH, 1930 to Meyer and Ethel Spiewak and grew up doing work externally to help support her family during the Great Depression. She obtained a liberal arts degree from Hunter College in 1951, and it was during this period that Rosalyn Yalow, a future Nobel Laureate, inspired her to delve deeper into Physics as the basis for her career. Dr. Dresselhaus completed her postgraduate study on a Fullbright Fellowship at the Cavendish Laboratory in the University of Cambridge from 1951 to 1952 and she subsequently obtained her Master's Degree from Radcliffe College in 1953. Under the guidance of Nobel Laureate, Enrico Fermi, she completed and obtained a Ph.D. from the University of Chicago in 1958, after which she went through her postdoctoral research for two years at Cornell University. She became the first female tenured faculty member of MIT in 1968 and in due course, she became the first female Institute Professor at MIT in 1985.

"Almost all women in science run into snags. There are roadblocks. People can be negative. We've all been through that. But put that behind you and move on."

-Mildred Dresselhaus

In 1990, Dr.Dresselhaus was awarded the National Medal of Science for her significant contributions to female empowerment and her discoveries and research in the field of carbon structures and their electronic band structures. Her research paved the way for the monumental discovery of fullerenes and carbon nanotubes and also acted as the focal platform for the isolation and characterization of graphene. She won the IEEE Founders Medal in 2004, the Heinz Award in 2005, the Harold Pender Award in 2006, the Oliver E. Buckley Prize and the Oersted Medal in 2008, and the Vannevar Bush Award in 2009, all for her tremendous achievements in her scientific domain and her extensive work in bringing female scientists to the forefront. She created history by her appointment as the president of the American Association for the Advancement of Science, by being the first female to acquire that position. Along with several prominent intellectuals, Dr. Dresselhaus focused on strengthening the position of women in science and engineering through extensive seminars. Parallel to this, she continued her groundbreaking research in nanostructures and was bestowed with the Enrico Fermi Award and the Kavli Prize in Nanoscience in 2012, for the same. She was awarded the Presidential Medal of Freedom in 2014, and the IEEE Medal of Honor, for elevating the roles of women globally, as well as for her pivotal research in applied physics.

Throughout her life, Dr. Dresselhaus contributed enormously to the field of nanotechnology, setting the platform for it to grow into the universe it is today. Mildred or as people called her, Millie gave the foundational constructs of carbon nanotechnology. She came up with techniques to be able to study materials that were just an atom thick. She studied the atomic properties of materials and how they could be manipulated as required. Her work has played an important role in the development of many technologies such as electronic devices, lithium-ion batteries, renewable energy generators, etc.

Dresselhaus was one of the first people to play around with lasers to study the various properties of graphite. Upon observation, she saw that the vaporization of the laser led to clusters of carbon atoms which were later deemed as Fullerenes. She also predicted that the orientation of carbon atoms in carbon nanotubes played an important role in determining whether the material was to be a semiconductor or metallic. She learned that the properties of these nanotubes can be manipulated by switching up different properties like the tube diameter and chirality. Another important contribution of hers was in the designing of thermoelectric nano-materials which she hoped could generate electricity, turning waste heat into a usable form of energy in the process. Along with this she also helped in developing methods to make the resistance of a single quantum wire as a function of the nanowire diameter.

Dr. Dresselhuas was a pioneering revolutionary in the field of science and is the magic behind the world of Carbon structures as we know it today. Apart from her extensive and priceless research, she became a pillar of support and a role model for women involved with the STEM sphere. She was and forever will be, a guiding light to us all, a mentor in her ways of science and an epitome of what we should all aspire to be.

LEARNING GUIDE

Nanotechnology is popularly defined as the technology that operates on the nanoscale (about one billionth of a metre). Nanotechnology is better understood as the art of engineering down at this hard-to-fathom scale.

But it is not just one technology, it is a whole new toolkit. Nanotechnology has shown its potential to change almost everyt from unimaginably small computer chips to tiny machines that find and fix damaged arteries inside our bodies. It could ma energy cleaner, improve our living conditions, and make all of our existing technologies better. To know more about nanotechnology, here are a few resources that could help.

1. **Tutorials**
   https://nanohub.org/resources/102
   https://www.sigmaaldrich.com/IN/en/technical-documents/technical-article/materials-science-and-engineering/biosensors-and-imaging/tutorial-in-nanomaterials
   https://www.tutorialspoint.com/fundamentals_of_science_and_technology/nanotechnology.htm

2. **Playlists**
   https://www.youtube.com/watch?v=M8d3pxVb4c4
   https://www.youtube.com/watch?v=OLa8DQkKlyU
   https://www.youtube.com/watch?v=-bYaFgubQDw
   https://www.youtube.com/watch?v=IGjCOJqINPA

3. **Recommended Books**
   Introduction to Nanotechnology, by Charles P Poole and Frank J Owens
   Nanotechnology: Principles and Practices,by Sulabha K. Kulkarni
   Fundamentals of Nanotechnology, by Gabor L. Hornyak, H.F. Tibbals, John J. Moore and Joydeep Dutta
   Nanomaterials, nanotechnologies and design,by Michael F. Ashby

4. **Certification Courses**
   https://www.edx.org/course/introduction-to-the-modern-nanotechnology
   https://www.udemy.com/course/nanotechnology-an-introduction/
   https://www.igmpiindia.org/NANOTECHNOLOGYIndustrycertificate.html
   https://www.coursera.org/learn/nanotechnology
   https://www.coursera.org/learn/smart-materials-microscale-and-macroscale-approaches

MYTH BUSTER

In a world filled with so much fake news and internet rumors, it is easy to have misconceptions about something that is as technological as nanomaterials. To clear some of these misunderstandings here the top 4 myths about nanotechnology are exposed as false.

1. *Nanotechnology is a futuristic science that will take decades to have any practical use.*
   In reality, a huge range of nanomaterials and nanoproducts are already being used. For example, companies are attaching nanoparticles to cotton fabrics to create a wrinkle-resistant and stain-resistant material, and heavy weather-resistant clothing. By embedding nanoparticles of copper, zinc, silver, gold, and cerium into the fabric, textiles have been given anti-viral and anti-bacterial properties. Nanoparticles are also utilized in cosmetic products paints, adhesives, and plastics as well as play a crucial role in the automobile industry to produce lighter, safer cars.

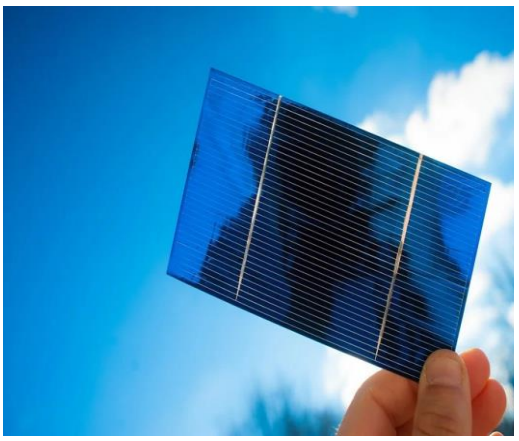
2. *Nanotechnology is so scientifically superior that manufacturing is only possible in tech-heavy areas such as Silicon Valley.*
   Nanoproducts are being produced in dozens of countries. Although we must keep in mind that the global leaders in nanotechnology research and manufacture are the United States and China. Australia, France, Poland, Turkey, Egypt, Spain, and Canada are also expanding in the nano-industry.

3. *Mankind's expertise and understanding of nanotechnology have already peaked.*
   Nanotechnology has only begun to find the countless advantages of using nanomaterials. For example, nanotechnology research is ongoing in the field of electronics where it is going to be crucial to develop next-generation computers and artificial intelligence.

4. *Nanoproducts are prohibitively expensive.*
   While early nanoproducts were expensive to manufacture and were used largely for the purpose of research, or high-end products (such as satellites or super-computers). Now, nanomaterials are being used in many low-end products. For example, everyday plastics can contain nanomaterials to add properties such as strength and flexibility. Car tires include nanomaterials to reduce weight, enhance durability and increase fuel efficiency.

GIZMO

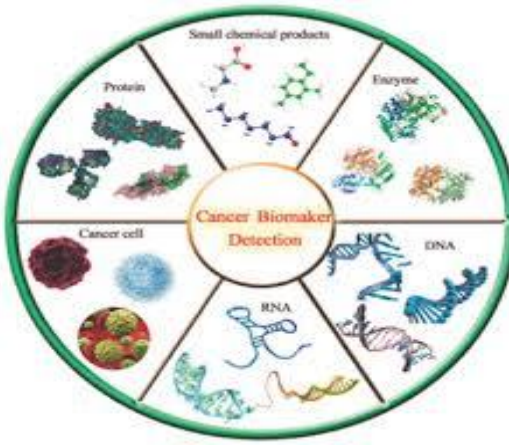
Nanotechnology deals with the production of materials with nanoscale dimensions in myriad aspects of life. Nanoparticles, due to their immeasurably minute dimensions, have high surface-to-volume ratios and thus specific properties. Nanotechnology is a novel technology, its prime applications are the innovation of methods to fabricate new products and formulate new chemicals. Also, Lower consumption of materials and energy leads to decreased harm to the environment.



Let's explore some of the fascinating applications of nanotechnology .

1. Have you ever wondered why solar cells are considered the future of energy? Although solar cells are prohibitively expensive and frustratingly inefficient, a promising new type of solar cell utilizing nanotechnology pans out. Initial trials of a revolutionary solar cell report conversion rates of up to 93 percent! These solar cells have the potential to power automobiles, homes, electronic devices without degrading the environment.

2. Without nanoengineering, we wouldn't have many of the electronics we use today. Intel is unmistakably a leader in microcomputer processors, and the latest generation of Intel's Core processor technology is a deca-nanometer chip. Isn't it mind-blowing to imagine a nanometer that is one-billionth of a meter?



3. Medical applications have adapted gold nanoparticles as probes for the detection of targeted sequences of nucleic acids. Gold nanoparticles are also being investigated as potential treatments for cancer.

4. Improved diagnostic tools enabled by nanotechnology are treading the path for earlier diagnosis, more individualized treatment options, and better therapeutic success rates. Research of nanotechnology is being conducted for the treatment of atherosclerosis, or the buildup of plaque in arteries. In one technique, researchers created a nanoparticle that mimics the body's "good" cholesterol , high-density lipoprotein , which helps to shrink plaque.

SUMMARY

Notes on Nanotechnology:

Science and engineering often go hand in hand. Thereby laying the foundation of today's technology-driven world with logical backing; If we were to take our study to the level of atoms and molecules followed by manipulation to build minuscule technology using materials, we plunge into the field of nanotechnology. It is a relatively new subject with widespread applications in various domains, noticeably in medicine.

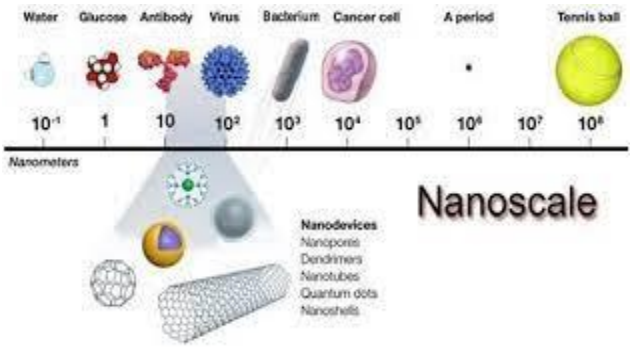
Source: https://nanotechnology.americanchemistry.com/

Before we dwell on the subject, it is crucial to note the difference between nanotechnology and nanoscience. The latter is the study of structures and materials on a small scale, alongside the properties which the materials demonstrate. The former is the design, process, and application of the studied materials to build something new out of them. Nanoscience is cross-disciplinary (seeing scientists from different fields studying nanomaterials and their properties). But nanotechnology uses these thoroughly researched and studied nanomaterials to create something unique.

The foundational idea of nanotechnology is to use individual atoms and molecules to construct functional structures.

But when we say 'small scale,' what do we really mean?

The nanoscale refers to structures with a scale of length applicable to nanotechnology, cited as 1–100 nanometers. So yes, we are dealing with a very minute scale.



SUMMARY

The idea originated in 1959 when Richard Feynman (an American physicist) conceptualized building materials/structures at the atomic and molecular scale in a speech.

However, this was just an idea. The practical use of nanotechnology was made public in 1981 when IBM scientists built the first scanning tunneling microscope based on the principles of quantum mechanical tunneling. The components include a metal tip, three piezoelectric scanners, a current amplifier, four bipotentiostat, and a feedback loop; this allows us to scan a tiny probe over the surface of a silicon crystal to see a single atom.

Further techniques have involved capturing images at the atomic scale; this includes the atomic force microscope, magnetic resonance imaging, and a modified light microscope.

Nanotechnology, with its microscopic scale, has a wide range of applications in various industrial sectors. The most common ones are:

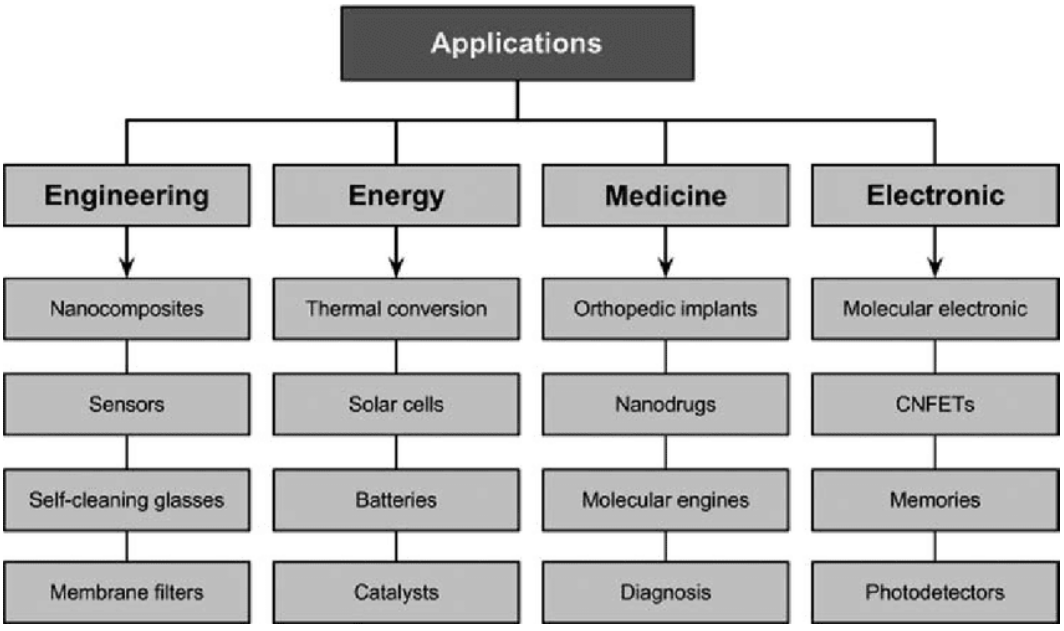
1) Electronics: Silicon was a widely used material for making compact, faster, and efficient microchips. However, carbon nanotubes have replaced the wide use of silicon to build lighter, more conductive, and rigid quantum nanowires.

2) Energy: Nanotechnology lowers the costs and produces stronger but lighter wind turbines, thereby improving fuel efficiency. Thermal insulation of certain nanocomponents can even save energy.

3)Biomedicine: The most noticeable application of nanotechnology is in the field of biomedicine. For example, Its applications can be found in Pharmacological research, supplementing the immune system, cryogenic storage of biological tissues, probing of DNA structure, detection of proteins, tissue engineering, tumor destruction, purification of biological molecules/cells, etc. Nanoparticles also enhance pharmaceutical products such as sunscreen.

4) Food: Nanobiosensors can detect the presence of pathogens or harmful toxins in food items. Furthermore, nanocomposites can also improve food production by increasing resistance and maintaining the transfer of oxygen in packaged products.

5) Environment: When talking about the environment, it is crucial to mention nanocatalysts as they make chemical reactions more efficient; this causes less pollution.

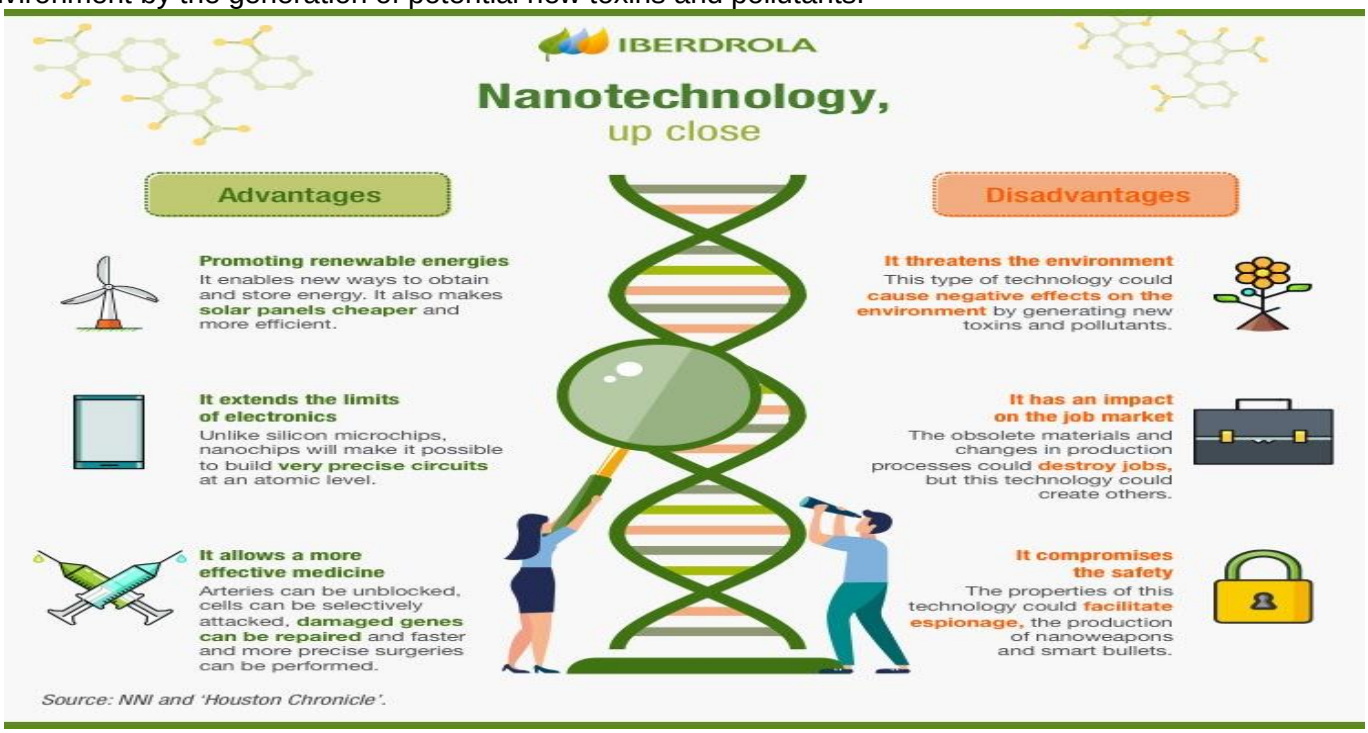


From the above points, we can conclude that nanotechnological applications in micro-manufacturing, organic chemistry, and molecular biology are prominent. In fact, between 2001 to 2013, 18 billion dollars was invested in the United States to turn this sector into an economically fueled competitive market.

SUMMARY

It is important to note that at the nanoscale, nanomaterials show qualitative differences. Two principal reasons for the same are:
1) The quantum mechanical effects come into play at a minute dimension. Thereby leading to new physical and chemical development.
2) A defining feature at the nanoscale is the large surface-to-volume ratio of these structures. For example, the reactivity of a metal catalyst particle increases as it has a reduced size. Macroscopic gold is chemically inert, but nanoscales gold becomes reactive and catalytic. It even melts at a lower temperature.

It is crucial to know that Nanotechnology has its own set of disadvantages. Experts in the field have debunked some of these negative scenarios. For example, "gray goo" was considered a viable threat(self-replicating nanobots consume everything around them to make copies of themselves). However, nanotechnology has harmful effects on the environment by the generation of potential new toxins and pollutants.



It can also impact the economic field. Although nanotechnology-built projects will initially be expensive, an increase in availability will directly impact markets. This will make certain materials or technologies obsolete, leading to some companies going out of business. In fact, the change in the manufacturing process will bring about mass job loss.

Nanotechnology raises the possibility of microscopic recording devices that could be possible thanks to their nanoscale; this means that they can be easily weaponizable. For example, "smart bullet," a computerized bullet to aim accurately, can be controlled/manipulated. It is a counter argument that these will help an army or government to secure their country. However, if it falls into the wrong hands, we can only wonder how massive the damage would be.

Every technological advancement comes with a fair share of advantages and disadvantages. While both sides should be carefully balanced, we must strive to pay more attention to the former for a technologically progressive society. Atoms are the building block of matter, and everything around is matter. I think that itself explains why we need a technology that would study materials at the atomic or molecular level to build new materials.

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4. https://www.britannica.com/technology/nanotechnology/Pioneers
5. https://smallbusiness.chron.com/advantages-disadvantages-nanotechnology-37398.html

FAQs

1. **What is Nanotechnology?**
   Nanotechnology is the study of particles- molecules, atoms, and sub atoms at the nanoscale (10^-9 metres- represented by nm). On a scale of comparison, human hair is about 80 000 nm. Nanoparticles are broadly classified into 0D(general nanoparticles), 1D(nanorod), 2D(nanofilm), and 3D(bulk powder)

2. **How are nanoparticles made?**
   There are plenty of ways employed in the manufacturing of nanoparticles, and those methods are broadly classified into two, based on the approach towards nanoscale. These are- the top-down method and the bottom-up method. The top-down method creates the nanoparticles by breaking down a bulkier material. The bottom-up method sculpts the nanoparticles by self-arrangement or supernatural arrangement of smaller particles into the bigger picture.

3. **What are the advantages of nanotechnology?**
   - Manufacturing of smaller scale and less-weight products which can be used everywhere
   - Creation of implantable health monitors and smart drugs
   - Energy-efficient devices can be created

4. **What will be the adversities due to this?**
   - Loss of privacy
   - Loss of employment in many sectors
   - Many unknown side effects either in the manufacturing process or in the finished product

5. **What are the challenges faced in the development of nanotechnology?**
   - Environmental impacts which cannot be assessed now due to the small scale implementation of this technology
   - Gaining public trust by getting rid of unwanted myths related to hazards in nanotechnology
   - Transparency of information about the way nanotechnology is put into use

6. **Which domains concern nanotechnology?**
   The following sectors use nanotechnology on a large scale: food industry, medical sector, paper and pulp industry, cosmetic industry, transportation and space research and energy and environment industries.

7. **Where can we see a future scope for this technology?**
   The following are the places where we can see various applications of nanotechnology, in present and in future:
   - Mini medical kits implanted inside the human/ animal body for continuous health tracking and boosting the health
   - More energy-efficient and smaller sensors can be developed
   - ‘Self-healing’ materials that can correct the cracks and other damages due to wear and tear
   - Ultra-dense memory to hold a zillion times more data than the present
   - Superior weather and earthly parameters monitor

8. **Are bio-based nanotechnology (eg- health monitors implanted in the body) safe?**
   Health monitors and other implantable devices would provide an extremely huge relief to millions of people suffering due to various disabilities across the world, be it nanobots fighting cancer, immune-boosting nanoparticles etc. But, there might be some side effects due to the same, which definitely is inevitable, because we are not all the same, right? The safety of such technologies can be assessed only when this is implemented on larger scales, across multitudes of people.

SPOTLIGHT

Domain: PnM and External Affairs

For productive working of any club or chapter, Seamless Flow of Work is important. Coordinating that flow is identical to finishing each task to accomplish key plans. IEEE-WIE is a technical chapter that is divided into 4 major departments namely technical, design, management, and editorial department. The utilization of social media (Facebook, Twitter, LinkedIn, and so forth) is presently viewed as an "absolute necessity" methodology for advancing any event. In any case, to make effective use of the promotional potential of social media and digital marketing, there is a lot to understand. I've had the golden opportunity to talk to a very ambitious, sweet, and confident woman, the Head of PnM and External affairs of IEEE-WIE, Snigdha Bhuyan. She is quite possibly the most persevering and devoted individual in our club. She has shared a portion of her encounters and perspectives about her position.

1)What is it like being the head of PnM and External affairs? What are your duties?

Snigdha: Well, this work should be done mindfully in light of the fact that regardless of whether there is a little blunder, I need to do everything all over again. Essentially my responsibility is to look after the social media accounts to expand the reach and generally it is identified as social media marketing. I need to keep a check on the content we are posting to ensure if we are getting positive reviews or not. My duties incorporate posting the contents, LinkedIn marketing, Facebook marketing, and furthermore Instagram marketing. When everything is done, I need to see the algorithm of Instagram and other social media platforms since it generally continues to change each month. For instance, to increase the reach of the post, first, you need to save it, then share it, and then like it. It is additionally important to ensure organic leads or followers to sustain the engagement.

2)How would you guarantee appropriate exposure to an event?

Snigdha: For the publicity part, we request individuals from the club to share the posters of our event alongside the registration forms in their Whatsapp stories. Instagram is the greatest stage to produce natural leads and afterward comes LinkedIn, so we ask individuals to initially save the Instagram post of the event, then, at that point share it, and afterward like it to extend the engagement. As per the analytics, if we follow this methodology, it will help to expand our reach. In the case of Facebook, to build the contact you need to share the event details in as many groups as possible. Additionally one can share details of the occasion on Whatsapp groups, telling individuals about the advantages of the occasion and is there any good reason why they shouldn't pass up on this chance.

3)What are your Marketing strategies for the success of an event?

Snigdha: There are various advertising strategies utilized like content marketing, email marketing, HTML marketing, search engine optimization is another technique. For instance, you may have gotten a mail with a picture connected to it, it's nothing, but an illustration of HTML email marketing. On account of email marketing, we may send emails to chapter members inviting them to attend our event hoping we will get a positive response. Furthermore, last but not the least, the blogs that we publish are an illustration of content marketing.

4)What are the social media handles of IEEE-WIE utilized for? How can it add to the advancement of the chapter?

Snigdha: We fundamentally use Instagram and Facebook to build engagement in light of the fact that the majority of the youngsters are on Facebook and Instagram, so it's simpler to extend engagement and when you put more informative posts and blogs, it is simpler to expand our reach.

5)What sort of development would you like to see in IEEE-WIE later on?

Snigdha: Presently from the Publicity point of you, I think everything is working out in a good way however publicity isn't just about composing specific content and afterward proceeding to post, you must be very specific with the design work. Design Domain is learning new things but what happens is that it's not always easy for them to think of a new method for inventive thoughts, So perhaps I might want to see the design domain evolve, grow, and an expansion in the significance of the design domain.

STAR PERFORMERS

1. **Design:**
   Candace Joy is undoubtedly an incredible artist when it comes to designing aesthetic posters. Being a dedicated member of the design domain, Candace is spontaneous when it comes to volunteering for any task. She leaves no stone unturned to make sure her works are appealing to the eyes of the audience. We are utterly proud to have a meticulous member like Candace in IEEE-WIE. Keep climbing the ladder up in the field of design, Candace!

2. **Editorial:**
   Suhasini Srivastava has time and again proved to be one of the most valuable members of IEEE-WIE. From writing insightful articles for newsletters to weaving mesmerizing captions, Suhasini has aced them all. Her sincere dedication towards the domain never ceases to inspire others. She willingly volunteers for all the tasks and never hesitates to explore the diverse facets of being a creative writer. Keep up the good work, Suhasini!

3. **Management:**
   Ishita Chauhan, a member of the management domain, has consistently contributed to the chapter's work. She has proactively assisted the senior members with various internal tasks. Ishita has always come across as a productive and helpful person, who religiously completes all the work assigned to her. Having a dedicated and committed member like Ishita in this chapter has always proved to be a blessing. Huge shout out to Ishita for her ardent and remarkable contributions!

4. **Technical:**
   Being a member of this chapter, members are always encouraged to acquire new skills, be it technical or non-technical. Pratya Chandrayan has always shown the zeal to learn new skills along the way. Along with being a talented individual, Pratya is also a great team member. She cooperated very well with her team members to conduct two successful night sessions on complex yet fascinating topics. Kudos to Pratya for all the efforts she has put in!

EDITORS

Vrushali Deshmukh- Editor-in-Chief

Harika Naishadham

Saipriya Rajagopal

Suhasini Srivastava

Shreya Thaplyal

Vasundhara Polya

Tisha Chawla

Akshata Bhat

Muskan Bansal

Haripriya Bangaru

Shivani Ravishankar

Ishita Chauhan

Anjali Jha