Nanotechnology for wastewater treatment

Researchers of Iran University of Science and Technology managed to apply nanotechnology for optimizing the process of using liquid membrane for wastewater treatment.

Vice president: 3,700 NTBFs operating in Iran

Science & Technology Desk

A total of 3,700 new technology-based firms (NTBF) are companies are operating across Iran and this number is increasing daily, particularly in big provinces, said Iran's vice president for science and technology in the central Iranian city of Arak on Tuesday evening.

Sorena Sattari added that in the year to March 2018, Iranian NTBFs sold products valued at more than $13.33 billion which is a great honor for domestic production, IRNA reported.

He called for relying on domestic capacities to stimulate production, boost entrepreneurship and move away from a single-product and oil-dependent economy.

Sattari said that by relying on oil revenues calculated at $60 per barrel, the domestic economy will not become dynamic, adding further investment is required in research and technology sectors and putting ideas into practice.

He noted that economic growth is not achieved by exporting oil, but by developing NTBFs, boosting entrepreneurship and making personal investment which will lead to an increase in domestic economic indices and job creation.

Sattari said the officials and managers of executive organizations are duty-bound to create positive trade and business environment in Iranian provinces to enable the young generation to advance creativity and help prepare the ground for all-out development.

He said a positive and dynamic business atmosphere can be created by attracting domestic and foreign investment. Oil revenues, he said, should not be used in this process because if oil money is used to encourage entrepreneurship, huge challenges will be encountered within a short period.

Surviving from the period of sanctions will only be possible by relying on domestic capabilities and capacities and, in particular, developing Iranian NTBFs, he noted.

Sattari said the number of Internet users in Iran stands at 47 million, which is higher than half of the entire figure for the entire Middle East, adding the Middle East's biggest nanotechnology companies are in Iran.

IRNA

NASA poised to launch first Sun-skimming spaceship

NASA is poised to launch a $1.5-billion spacecraft on a brutally hot journey toward the Sun, offering scientists the closest-ever view of our strange and mysterious star.

After the Parker Solar Probe blasts off from Cape Canaveral, Florida on August 11, it will become the first spacecraft ever to fly through the Sun's scorching atmosphere, known as the corona, AFP reported.

Understanding how the corona works will help scientists anticipate dangerous space weather storms, which can disrupt the power grid on Earth.

"It's of fundamental importance for us to be able to predict space weather much the way we predict weather on Earth," explained Alex Young, a solar scientist at NASA.

The corona is a "very strange, unfamiliar environment for us".

'Touch the Sun'

The unmanned probe is named after Eugene Parker, the 91-year-old pioneering solar astrophysicist, and the US space agency has coined it as the first mission to 'touch the Sun'.

It will actually skim by at a distance of 3.83 million miles (6.16 million kilometers) above the Sun's surface.

Mission managers say that may sound like a lot but is really quite a close shave, given the sweltering conditions out there.

The Sun-facing side of the probe will endure temperatures of about 2,500°F (1,370°C).

The spacecraft is protected by a heat shield that will keep it closer to room temperature, about 85°F.

Speeding by at a pace of 430,000 miles per hour will make it "the fastest human-made object", said project scientist Nicky Fox of the Johns Hopkins University Applied Physics Lab.

Over the course of its seven year mission, the spacecraft aims to pass through the corona 24 times, which Fox said makes for an "incredibly daring journey".

Why the corona?

Unlike a campfire, which feels hottest at the source, the heat from the Sun gets more intense further away from its surface.

"As we go from the surface of the Sun, which is 10,000°F, and move up into the corona, we find ourselves quickly at millions of degrees," he said.

NASA calls this mismatch 'the coronal heating problem', and hopes the Parker Solar Probe will solve the mystery of why the corona reaches temperatures of up to 10 million degrees Fahrenheit.

Fox said scientists have already studied the corona "every way imaginable", and a closer look is now needed.

"We need to get into this action region, where all of these mysteries are actually occurring."

Heat shield

The probe is protected by a 4.5-inch-thick (11.43-centimeter) carbon-composite shield, built to withstand 500 times the Sun's radiation on Earth.

A series of instruments on board the spacecraft will measure the magnetic and electric fields, plasma waves and high energy particles.

There is also a white light imager, taking pictures of what the spacecraft is about to 'plow through', said Fox.

"The goal is to have the instruments on all the time but the prime science gathering for us is about 11 days," she told reporters ahead of the launch.

A 45-minute launch window opens on Saturday at 3:48 a.m. (07:48 GMT).

Awaiting liftoff, the car-sized probe is already packed on to the Delta IV-Heavy rocket at Cape Canaveral Air Force Station in Florida.

Electric car covered with 330 solar panels can recharge as it drives

A solar-powered saloon car that charges as it drives is being tested in Germany.

Munich-based manufacturer Sono Motors built the new prototype, dubbed Sion, to help Germany hit its national target of 1 million electric cars on the road by 2020, dailymail.co.uk reported.

Sion has solar cells integrated into its bodywork, with a total of 330 solar cells built into the roof, bonnet and sides of the vehicle.

These enable the vehicle to recharge its battery when sunlight is hitting the solar cells, whether it is on the road, or parked in the sunny spot in a car park.

Sono Motors have also included support for conventional power outlets — so car owners aren't left stranded on overcast days.

The Sion also features moss integrated into the dashboard to naturally filter out dust particles and regulate the humidity inside the cabin.

The solar panel-packed vehicle is set to launch in Germany in late 2019.

REUTERS

Sono Motors, which was founded in 2016, wants the Sion to be versatile and hopes to allow the car to be charged using solar energy as well as conventional outlets.

The firm has earmarked a 2019 date for mass production at one of its German plants.

Some 5,000 people have already placed orders for the electric vehicle, it claims.

Prices for the Sion are tipped to start from €16,000 ($18,540/£14,320) next year.

The all-electric vehicle will offer a range of around 155 miles (250km) before the battery depletes completely and it needs to recharge either via solar power or using a wall plug, the company said.

Sion was designed originally as an environmentally conscious car, but will also feature a number of feature designed around comfort to help it compete with other modern vehicles.

"We have a seat heater, there is air conditioning, there is a large infotainment system where I can also connect my phone interactively, which means I really have a full vehicle which is very simple, has no frills," Laurin Hahn, co-founder and chief executive of the startup told Reuters.

Sion also uses moss to ventilate the vehicle.

The Icelandic strain of moss is claimed to have air-cleaning capabilities that can filter dust particles and act as a natural air filter.

Sono Motors said the moss, which is visible on the dashboard to those inside the vehicle, does not need water or other special care to maintain.

The firm originally crowdfunded the project, raising more than $200,000 (£154,000) to build the first prototype vehicle.

Sono previously revealed that there will be two models available — the 'Urban' and the 'Extender' model.

The car is a six-seater, with three front seats, and three in the back, which can be flipped down to provide more room for storage.

Laurin Hahn of Sono Motors, said in 2016, "We started four years ago in a garage and soon got bigger and moved to a bigger workshop.

"The team got bigger and we managed to finish our first pre-prototype in early 2016.

"At that time we founded the Sono Motors. Right from the beginning we had the plan of doing a crowdfunding campaign.

"It was always on our mind to make this happen with all the people out there, who want to see the same change as us."

As well as charging the vehicles, the solar panels can be plugged in to other devices, such as cooking stoves, to provide power.

Advocates condemn psych techniques used to keep kids online

Children's advocates want the American Psychological Association to condemn the tech industry's practice of using persuasive psychological techniques to keep kids glued to their screens.

The advocates, citing research that links excessive use of social media and video games with depression and academic troubles, say it is unethical for psychologists to be involved in tactics that risk harming kids' wellbeing. Skeptics say the research is inconclusive, and they note that psychologists have been involved in other industries' marketing and advertising for decades, washingtonpost.com reported.

The group seeking intervention includes 60 US psychologists, researchers, children's advocates and the Children's Screen Time Action Network, a project of the Boston-based Campaign for a Commercial-Free Childhood. The network was publishing a letter Wednesday to the American Psychological Association, coinciding with the association's annual meeting in San Francisco.

"There are powerful psychology principles and technology that are being used against kids in ways that are not in their best interests," said Josh Golin, the executive director of the Campaign for a Commercial-Free Childhood.

That technology uses computers to help figure out what motivates people and influence their online behavior. It is built on age-old tenets of behavioral psychology that marketers and advertisers have long used to get people to buy their products. The difference is smartphones are ubiquitous and unlike human marketers, they do not get tired, said B.J. Fogg, a behavioral scientist at Stanford University who has been called the technology's pioneer.

Fogg said he has aimed to use persuasive tech to enhance people's lives. But he also said he has long warned that it has a 'dark side', including potential loss of privacy and the potential for encouraging behavior that is not in users' best interests.

The letter to the psychology association cited a recent study that found that teen girls who spend a lot of time on digital devices, including on social media, are at risk for depression and suicidal behaviors. That study could not show whether depressed girls might be more prone to using social media than other teens.

The letter also noted evidence that some teen boys overuse video games "at the expense of obtaining real-world competencies", including college educations and jobs.

"Families don't understand why their kids are so strongly attracted and pulled to these devices," said Richard Freed, a Walnut Creek, California, psychologist who signed the letter.

He said the World Health Organization's decision in June to declare excessive video gaming an addiction shows that the problem is real.

TATAN SYUFLANA/ASSOCIATED PRESS

Youths look at computer screens at an Internet café in Jakarta, Indonesia, on December 23, 2013.

Under Fogg's model, technology can change a person's behavior by tapping into hard-wired motivations, simplifying the activity and getting people to perform it with a 'well-timed' trigger.

That could mean an app prompting a person to go running or it could be an alert persuading someone to spend more time on social media based on their innate desire to win acceptance and avoid social rejection.

It is not just the big tech firms. BuzzFeed reported on Tuesday, based on a confidential company memo, that founders of a startup recently acquired by Facebook boasted of using a "psychological trick" — custom social media profiles and mysterious calls to action — to get high schoolers to download a polling app. Facebook later shut down the app.

In job postings, big tech companies have sought psychologists and people with psychology training for research into user experiences. Microsoft's Xbox user research division is led by psychologists. Amazon looks for hires who "geek out over user research, psychology, ethnography". Google's preferred qualification for some positions includes a doctorate in experimental psychology.

"We strive to learn and understand our users' needs, behaviors, and emotions to yield insights that inform product strategy and guide the design of the experiences we create," said one Google job posting online this week.

Facebook and Google did not return requests for comment on Tuesday on whether they use psychological persuasion techniques to build digital products for children. Microsoft, Apple and Amazon declined to comment.

This year, those companies have promoted better digital well-being amid rising concerns about kids' digital distractions. The Internet Association, an industry trade group, said its member companies endeavor to create safe and positive online experiences.

"This is an important conversation, and the internet industry remains committed to developing and sharing best practices, partnering and collaborating with experts, and developing resources and programs that will ensure positive online experiences," the association's Noah Theran said in the statement.

Apple is introducing new tools meant to make its iPhone less addictive after two major shareholders earlier this year called on the company to curb smartphone addiction among children. Facebook, YouTube and Microsoft have introduced similar tools.

The American Psychological Association has no policy on using psychological research to develop persuasive digital technology.

But in a statement responding to the advocates' letter, the association CEO, Arthur Evans Jr., said the group "is concerned about the increasing amount of time children are spending on digital devices".

He said the association is examining psychology's role in technology development, and that an association committee will discuss the letter and whether to recommend any action.