Technology Roundup

A NEWS BULLETIN

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1st International Symposium on Frontiers in Computational Chemistry

International Workshop on 2D Materials & Quantum Effect Devices

Pakistan's Socio-Economic Outlook: The Way Forward

International Conference on Strengthening Teaching and Research Capacity: Collaborative Partnership in Social Sciences

1st National Conference on New Horizons of Botany in Pakistan

4th International Conference on Research in Engineering, Technology and Science (ICRETS)

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Tech & Trade Offers

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NUST Researchers Designed first Home-Grown Microprocessor

Researchers at the National University of Sciences and Technology (NUST) have successfully completed full functional testing of the country's first truly indigenously designed microprocessor, `NTiny-E'.

This was revealed by the Pro-Rector (Research, Innovation and Commercialization), National University of Science and Technology (NUST), Dr. Rizwan Riaz during a press conference along with Principal SEECS, Dr. Ajmal Khan and NTiny-E design and development team Leader, Dr. Rehan Ahmed. Dr. Rizwan Riaz told that the embedded microprocessor chip was designed by the research team of the NUST School of Electrical Engineering and Computer Science (SEECS). The semiconductor chips are at the heart of all electronic devices and consumer appliances being used every day. Global semiconductor sales reached $556 billion in 2021 but Pakistan has not been able to benefit from this lucrative market. However, NUST, in line with its vision of undertaking applied research and innovation, embarked upon the journey to make Pakistan self-reliant in this critical technology. The unique aspect of the project is its completely in-house design as opposed to common practice of using open-source cores from other sources or foreign collaborations.

Image credit: https://asianthinktank.com/nust-researchers-successfully-test-pakistans-first-indigenously-designed-microprocessor/

Source: https://www.thenews.com.pk/print/966003-nust-realises-pakistan-s-first-truly-indigenous-embedded-microprocessor

Korean Surgeons Explain Latest Methods of Spine Surgery

The Korean surgeons explain latest methods of spine surgery. A five-member team of Korean Orthopedic Surgeons shared their experiences with the Pakistani doctors on modern methods of treatment of Spine Surgery, at the Lahore General Hospital (LGH).

Operations of those patients undergoing spine treatment were performed. This effort was aimed at providing latest surgical techniques and procedures by surgeons apart from benefitting from latest trends so that young doctors can adopt this advanced technology in their day to day treatment of patients of spines.

Talking to the participants, Principal Post Graduate Medical Institute and Ameer Uddin Medical College Prof. Dr. Muhammad Al-Freed Zafar said that the internationally renowned Korean specialists and medical experts have provided an opportunity to young consultants to learn about different new innovations which are useful in their future professional life.

Mian Muhammad Hanif, Orthopedic Professor at LGH, said that the course was organized by Pakistan Association of Spine Surgeons in collaboration with Korean University of Medicine team comprising of five doctors led by Prof. Seung Woo Suh. Talking to the media, Prof. Al-Freed Zafar hoped that this workshop would enhance the knowledge and skills of local doctors which would directly benefit the patients and the doctors of Spine Surgery.

Lahore General Hospital (image credit: https://dailytimes.com.pk/)

Source: https://www.brecorder.com/news/40180960/korean-surgeons-explain-latest-methods-of-spine-surgery

Pakistan Develops New Soybean Line to Reduce Imports

Pakistan develops new intercropping-specific soybean line to reduce imports. This advanced Chinese technology makes better use of available space to increase the amount of crops that can be harvested on the same area of land as soybean production is like an added 'bonus', which has been helping Pakistan ease soybean shortage and cut down soybean imports since four years ago.

This season, the total demonstrative area of maize-soybean strip intercropping technology in Pakistan has surged to over 400 acres, about 2.67 times that of last autumn. Now, harvesting is going on in the demonstration plots, which is expected to achieve promising results soon. "Last season, more than 200 farmers have used our technology, and the number is still rising day by day. Farmers are quite satisfied with the results.

Most significantly, this season, a new intercropping specific soybean line has been developed by Dr. Muhammad Ali Raza and Dr. Zaheer Ahmed, Incharge Soybean Lab at University of Agriculture, Faisalabad (UAF). It's learned that the new soybean line can easily produce soybeans of 480 to 720 kg per acre in intercropping system, while the production of other soybean varieties only stagnates from 200 to 400 kg per acre. "This season we planted new soybean line with intercropping technology and harvested the plants and we have observed soybean line full with pods. The Governor of Punjab Muhammad Baligh Ur Rehman encouraged local soybean production to reduce the increasing import costs in a recent meeting with Prof. Dr. Athar Mahboob, Vice Chancellor of the Islamia University of Bahawalpur (IUB) and Muhammad Ali Raza.

Source and image credit: https://www.app.com.pk/global/pakistan-develops-new-intercropping-specific-soybean-line-to-reduce-imports

Roboticists go off road to Compile Data that could Train Self-driving ATVs

Researchers from Carnegie Mellon University took an all-terrain vehicle on wild rides through tall grass, loose gravel and mud to gather data about how the ATV interacted with a challenging, off-road environment. They drove the heavily instrumented ATV aggressively at speed up to 30 miles an hour. They slid through turns, took it up and down hills, and even got it stuck in the mud, all while gathering data such as video, the speed of each wheel and the amount of suspension shock travel from seven types of sensors.

The resulting dataset, called TartanDrive, includes about 200,000 of these real-world interactions. The researchers believe the data is the largest real-world, multimodal, off-road driving dataset, both in terms of the number of interactions and types of sensors. The five hours of data could be useful for training a self-driving vehicle to navigate off road. “Unlike autonomous street driving, off-road driving is more challenging because you have to understand the dynamics of the terrain in order to drive safely and to drive faster,” said Wenshan Wang, a project scientist in the Robotics Institute (RI). The research team found that the multimodal sensor data they gathered for TartanDrive enabled them to build prediction models superior to those developed with simpler, nondynamic data. Driving aggressively also pushed the ATV into a performance realm where an understanding of dynamics became essential, said Samuel Triest, a Master’s student in robotics.

“The dynamics of these systems tend to get more challenging as you add more speed,” said Triest, who was lead author on the team’s resulting paper. “You drive faster, you bounce off more stuff. A lot of the data we were interested in gathering was this more aggressive driving, more challenging slopes and thicker vegetation because that’s where some of the simpler rules start breaking down.

Source and image credit: https://www.ri.cmu.edu/roboticists-go-off-road-to-compile-data-that-could-train-self-driving-atvs/

Magnetic Material could help Monitor Battery Life

A new study shows how a magnetic material can be used to help monitor the amount of life left in a rechargeable battery before it needs to be recharged.

Shenqiang Ren, a scientist and engineer at the University at Buffalo (UB), led the project and explains how the system works. As lithium-ion batteries charge and discharge, lithium ions flow from one side of the battery to the other. With this in mind, Ren's team built a lithium-ion battery that uses a special material at one end, a compound whose magnetism changes as lithium ions enter or leave it. This makes it possible to measure the battery's level of charge by tracking changes in the material's magnetism, Ren says.

"The main goal of this project was working on the magneto-ionics, which uses ions to control the magnetism of materials. As the lithium ions travel in or out of the material we are using, the material will change its magnetization. We can monitor the magnetism, and this enables us to indirectly monitor the lithium ions, the state of charge. We believe this is a new way to provide an accurate, fast, responsive sensing of state of charge," says Ren, PhD, UB professor of mechanical and aerospace engineering, and of chemistry, and a core faculty member in the UB RENEW Institute. The team's magneto-ionic material is made from vanadium, chromium and cyanide, with an aqua ligand.

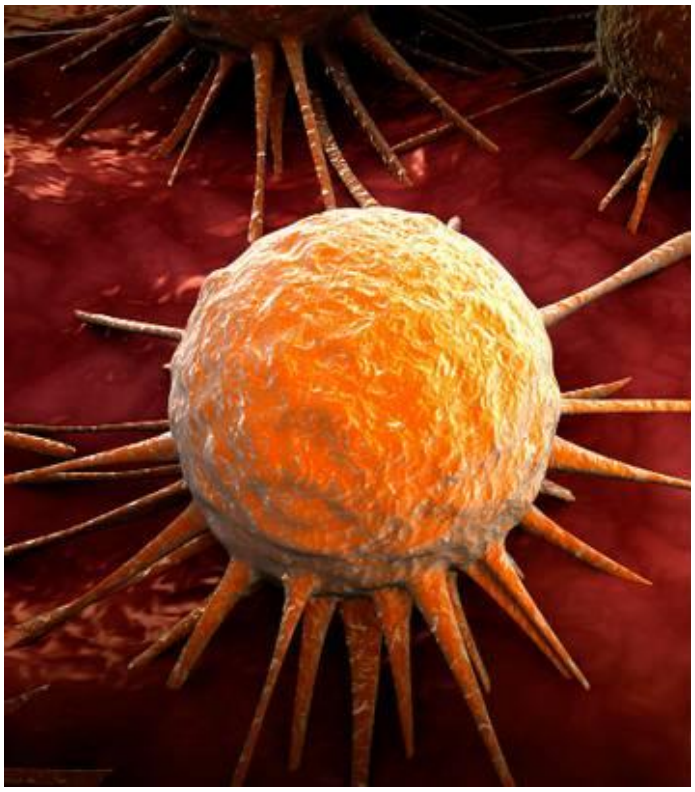
Source and image credit: https://www.buffalo.edu/news/releases/2022/06/013.html

Massive breakthrough as cancer vanishes for all patients in a drug trial

A group comprising 18 patients took a drug called Dostarlimab for around six months, and in the end, every one of them saw their tumors disappear. In conversation with the New York Times, Dr. Luis Diaz, an author of a paper, said he could not remember any other study wherein cancer was obliterated in patients. “I believe this is the first time this has happened in the history of cancer,” Diaz added.

According to the NY Times, the patients, who were a part of the study, had previously faced grueling treatments including chemotherapy, radiation and, most likely, life-altering surgery. “A complete remission in every single patient was unheard-of”, said Dr. Alan Venook, a colorectal cancer specialist at the University of California. Venook commended the research as a world-first, noting that the absence of significant side effects meant that “either they (patients) did not treat enough patients or, somehow, these cancers are just plain different.”

However, in an editorial accompanying the paper, Dr. Hanna K. Sanoff of the University of North Carolina’s Lineberger Comprehensive Cancer Center, who was not affiliated with the study, termed it “small but compelling” but said it was not clear if the patients were cured. “Very little is known about the duration of time needed to find out whether a clinical complete response to equates to cure,” Sanoff said.



Source and image credit: https://dailytimes.com.pk/948615/massive-breakthrough-as-cancer-vanishes-for-all-patients-in-a-drug-trial/

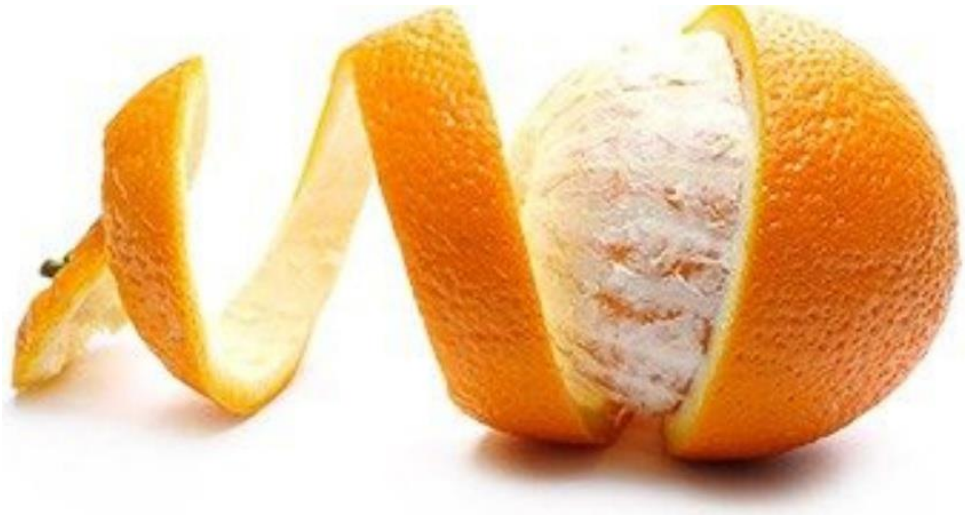
Zapping Orange Peel Oil into New, Pleasant aroma compounds

As oranges are peeled, they spray tangy, citrus scented oil into the air. The main compound in the fragrant mist is limonene, which can be collected from discarded peels and used in flavorings, perfumes and all-purpose cleaners. Now, researchers have treated limonene with electricity and ethanol, transforming it into a mixture of pleasant-smelling aroma compounds, some of which haven't been identified before.

Limonene is regularly used in its original form, but it can also be the starting platform for other scents. But synthetic oxidation techniques that can perform this transformation have traditionally required environmentally harmful substances, such as strong chemicals and heavy metals. So, Holger Zorn and colleagues tested an environmentally benign oxidation method, mixing limonene with ethanol and applying an electrical current to the solution.

The process generated an amber-colored liquid with a pleasant odor and 17 different compounds that had fruity, herbal, citrus and resinous notes. According to the researchers, this is the first time that most of these compounds have been described.

The simple, sustainable method could create valuable aroma compound mixtures for flavorings or fragrances, but the compounds must be evaluated for safety before use in commercial products, the researchers say.



Source and image credit: https://www.acs.org/content/acs/en/pressroom/presspacs/2022/acs-presspac-june-1-2022/zapping-orange-peel-oil-into-new-pleasant-aroma-compounds.html

DNA Nanotech Safe for Medical use, New study suggests

Advances in nanotechnology have made it possible to fabricate structures out of DNA for use in biomedical applications like delivering drugs or creating vaccines, but new research in mice investigates the safety of the technology.

Using a technique called DNA Origami (DO), a process which involves folding complementary strands of DNA into double helixes over and over again, scientists can construct a variety of tiny devices with complex shapes that could be injected in the body to deliver medicines or perform other tasks. But because this technology is still relatively new, scientists have been divided on whether nanostructures could cause dangerous immune responses or be toxic in other ways in animal systems. Now, a team of researchers from The Ohio State University has taken an initial step toward answering that question. The study, published in the journal Small, found that while high amounts of these DNA devices can cause a slight immune response, it isn't marked enough to be dangerous. Their findings also suggest that different shapes may be more conducive to different therapeutic applications.

"DNA is unbelievable in terms of construction and how it's able to be manipulated and designed to form nano-robots in a very coordinated manner," said Christopher Lucas, lead author of the study and a research scientist in mechanical and aerospace engineering at Ohio State. "We believe this technology, which has an incredible amount of potential, can be used to diagnose, treat and prevent disease." To test if that can be done safely, Lucas' team used mice to compare the biodistribution and toxicity of two distinct nanostructures: a flat single-layer 2D Triangle called "Tri," and a 3D rod-shaped structure that was given the moniker "Horse." Over a period of 10 days, about 60 female mice were continuously given IV injections of both DO structures. But to really test the safety, the researchers repeatedly dosed the mice at a concentration 10 times greater than in previous studies. Researchers did see that Tri and Horse created shape-dependent inflammatory responses, but because the response diminished over time, they showed that the immune reaction was relatively harmless in the long run.

Source and image credit: https://news.osu.edu/dna-nanotech-safe-for-medical-use-new-study-suggests/

Giving Metal to Microbes could reduce Greenhouse gas

New research finds when microbes don't get the metals they need, the result may be more consequential than previously understood. Like you and me, microbes need some metals in their diet to stay healthy. The metals help the microbes fully "digest" food. After a good meal, the microbes that gain energy by chemically reducing nitrate release a harmless byproduct: nitrogen, the gas that makes up 78% of Earth's atmosphere.

But if one metal in particular, copper isn't available, these microbes can't complete the biochemical "digestive" process, called denitrification. Instead of releasing nitrogen, they'll release the potent greenhouse gas nitrous oxide. Previous lab studies using pure cultures have shown that copper availability was important for denitrification. Now research from the lab of Daniel Giammar, the Walter E. Browne Professor of Environmental Engineering at the McKelvey School of Engineering, and Jeffrey Catalano, professor of earth and planetary sciences in Arts & Sciences, both at Washington University in St. Louis, has shown that in the complex, dynamic aquatic environments these microbes call home, there might not always be enough copper available for denitrification.

"Material in a beaker is not the same as material in the environment," Giammar said. "A big part of our approach was to take real materials from real environmental systems and bring them to the lab and look at them in controlled ways." The findings underscore the outsized role of copper when it comes to the release of nitrous oxide. "At regular, background levels, these systems may not have enough metals to carry out the process," said Neha Sharma, a PhD student in Giammar's lab. That's important because nitrous oxide is the third most potent greenhouse gas and 50% of it comes from microbes in aquatic ecosystems.

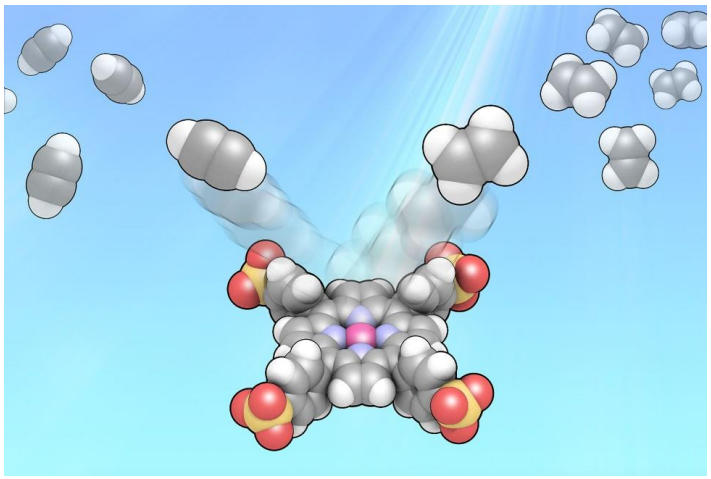
Riparian wetland at Tims Branch. (Image credit: Kenneth Kemner/Argonne National Laboratory)

Source: https://source.wustl.edu/2022/06/giving-metal-to-microbes-could-reduce-greenhouse-gas/

Photosynthesis-Inspired Process makes Commodity Chemicals

New strategy is less expensive, less energy intensive than current industrial processes. Northwestern University chemists have taken inspiration from plants to revolutionize the way an important industrial chemical is made. In a first for the field, the Northwestern team used light and water to convert acetylene into ethylene, a widely used, highly valuable chemical that is a key ingredient in plastics. While this conversion typically requires high temperatures and pressures, flammable hydrogen and expensive metals to drive the reaction, Northwestern's photosynthesis-like process is much less expensive and less energy intensive. Not only is the new process environmentally friendly, it also works incredibly well, successfully converting nearly 100% of acetylene into ethylene. "In industry, this method requires energy-intensive processes that need high temperatures, an external feed of flammable hydrogen gas and materials containing noble metals, which are expensive and difficult to obtain," said Northwestern's Francesca Arcudi, co-first author of the study. "Our new strategy solves all these issues at once. It operates using light and water in place of high temperatures and hydrogen. And instead of expensive metals, we use naturally abundant, inexpensive materials." The resulting strategy worked shockingly well. Whereas the current industrial process results in 90% selectivity for ethylene, the Northwestern approach has 99% selectivity for ethylene.

"This is important because it's a commodity chemical with high economic value," said Northwestern's Luka Dordevic, co-first author of the study. "The more you can produce without waste, the better."



Source and image credit: https://news.northwestern.edu/stories/2022/06/photosynthesis-inspired-process-makes-commodity-chemicals/#:~:text=Northwestern%20University%20chemists%20have%20taken,a%20key%20ingredient%20in%20plastics

Ancient Ocean Floors could help search for critical minerals

Studying ancient ocean floors could help discover minerals needed to produce electric cars and solar panels. Researchers at The University of Queensland (UQ) led a collaborative study that examined the remnants of ocean floors in eastern Australia and central Asia and applied a method to date the age of calcite trapped inside.

Dr Renjie Zhou from UQ's School of Earth and Environmental Sciences said the findings could make it easier to source critical minerals used in renewable and clean technologies. "Calcite and other hydrothermal minerals are often observed in critical mineral deposits and form under mineralising fluid activities," Dr Zhou said. "Our work shows that we can trace the history of fluids in the Earth's crust and see when and what mineral resources they might generate." The renewable energy sector is continuing to grow rapidly with increasing demand for technologies like wind turbines, solar panels, electric vehicles and batteries. "These often require large quantities of critical minerals," he said. "Electric vehicles need up to four times more copper than conventional cars and a single wind turbine uses several tonnes of permanent magnets made of rare earth metals." Dr Zhou said being able to study and discover these minerals was going to become increasingly important. "Researchers across many institutions are doing excellent work in this field, including UQ's Centre for Geoanalytical Mass Spectrometry," Dr Zhou said. "Our hope is to expand our collaboration with industry and academia to increase the understanding and discovery of critical minerals in the future."

Source and image credit: https://www.uq.edu.au/news/article/2022/05/ancient-ocean-floors-could-help-search-critical-minerals

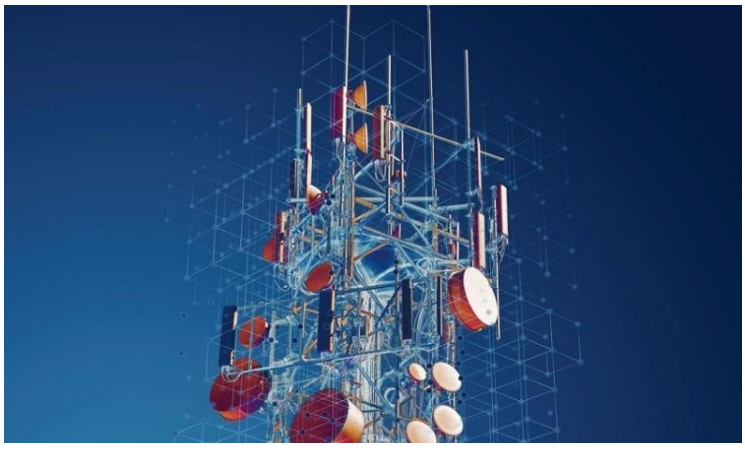
'Beam-steering' Technology takes Mobile Communications beyond 5G

Birmingham scientists have revealed a new beam-steering antenna that increases the efficiency of data transmission for ‘beyond 5G’ and opens up a range of frequencies for mobile communications that are inaccessible to currently used technologies. Experimental results, presented for the first time at the 3rd International Union of Radio Science Atlantic / Asia-Pacific Radio Science Meeting, show that the device can provide continuous ‘wide-angle’ beam steering, allowing it to track a moving mobile phone user in the same way that a satellite dish turns to track a moving object, but with significantly enhanced speeds.

Devised by researchers from the University of Birmingham’s School of Engineering, the technology has demonstrated vast improvements in data transmission efficiency at frequencies ranging across the millimeter wave spectrum, specifically those identified for 5G (mmWave) and 6G, where high efficiency is currently only achievable using slow, mechanically steered antenna solutions. For 5G mmWave app lications, prototypes of the beam-steering antenna at 26 GHz have shown unprecedented data transmission efficiency.

“Although we developed the technology for use in 5G, our current models show that our beam steering technology may be capable of 94% efficiency at 300 GHz. The technology can also be adapted for use in vehicle-to-vehicle, vehicle-to-infrastructure, vehicular radar, and satellite communications, making it good for next generation use in automotive, radar, space and defense applications”, said Dr James Churm, Research Fellow, School of Engineering.

The device is fully compatible with existing 5G specifications that are currently used by mobile communications networks. Moreover, the new technology does not require the complex and inefficient feeding networks required for commonly deployed antenna systems, instead using a low complexity system which improves performance and is simple to fabricate.



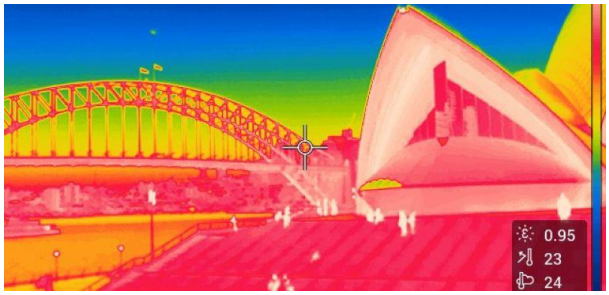
Source and image credit: https://www.birmingham.ac.uk/news/2022/beam-steering-technology-takes-mobile-communications-beyond-5g

Major Infrared breakthrough could Lead to Solar Power at Night

Using technology similar to night-vision goggles, researchers have developed a device that can generate electricity from thermal radiation. The sun's enormous energy may soon be harnessed in the dark of night following a significant advance in thermal capture technology. Solar radiation heats the earth's crust significantly during daylight hours, but that energy is lost into the coldness of space when the sun goes down. Now, researchers within the School of Photovoltaic and Renewable Energy Engineering at UNSW Sydney have successfully tested a device capable of converting infrared heat into electrical power.

The team, including members of the ARC Centre of Excellence in Exciton Science, used a power-generation device called a 'thermo-radiative diode', which is similar to the technology in night-vision goggles. Exciton Science Associate Investigator Nicholas Ekins-Daukes, the leader of the research team, said: "In the late 18th and early 19th century it was discovered that the efficiency of steam engines depended on the temperature difference across the engine and the field of thermodynamics was born." The same principles apply to solar power, the sun provides the hot source and a relatively cool solar panel on the Earth's surface provides a cold absorber. This allows electricity to be produced.

"However, when we think about the infrared emission from the Earth into outer space, it is now the Earth that is the comparatively warm body, with the vast void of space being extremely cold. "By the same principles of thermodynamics, it is possible to generate electricity from this temperature difference too, the emission of infrared light into space." Norwegian researcher Rune Strandberg first explored the theoretical possibility of such a device, and researchers at Stanford University are investigating alternative approaches to capturing thermal energy at night. The amount of energy produced through this new test is small (roughly equivalent to 0.001% of a solar cell), but the proof of concept is significant. "We usually think of the emission of light as something that consumes power, but in the mid-infrared, where we are all glowing with radiant energy, we have shown that it is possible to extract electrical power," Nicholas said.



Source and image credit: https://excitonscience.com/news/major-infrared-breakthrough-could-lead-solar-power-night

Electronic Skin: Physicist Develops Multisensory Hybrid material

The "smart skin" developed by Anna Maria Coclite is very similar to human skin. It senses pressure, humidity and temperature simultaneously and produces electronic signals. More sensitive robots or more intelligent prostheses are thus conceivable.

In particular, robotics and smart prosthetics would benefit from a better integrated, more precise sensing system similar to human skin." The ERC grant winner and researcher at the Institute of Solid State Physics at TU Graz has succeeded in developing the three-in-one hybrid material "smart skin" for the next generation of artificial, electronic skin using a novel process.

For almost six years, the team worked on the development of smart skin as part of Coclite's ERC project Smart Core. With 2,000 individual sensors per square millimeter, the hybrid material is even more sensitive than a human fingertip. Each of these sensors consists of a unique combination of materials, a smart polymer in the form of a hydrogel inside and a shell of piezoelectric zinc oxide. Coclite explains, "The hydrogel can absorb water and thus expands upon changes in humidity and temperature. In doing so, it exerts pressure on the piezoelectric zinc oxide, which responds to this and all other mechanical stresses with an electrical signal." The result is a wafer-thin material that reacts simultaneously to force, moisture and temperature with extremely high spatial resolution and emits corresponding electronic signals. "The first artificial skin samples are six micrometres thin, or 0.006 millimetres. But it could be even thinner," says Anna Maria Coclite. The individual sensor layers are very thin and at the same time equipped with sensor elements covering the entire surface. This was possible in a worldwide unique process for which the researchers combined three known methods from physical chemistry for the first time, a chemical vapor deposition for the hydrogel material, an atomic layer deposition for the zinc oxide and nanoprint lithography for the polymer template.

Image credit: TU Graz/Lunghammer

Source and image credit: https://www.tugraz.at/en/tu-graz/services/news-stories/tu-graz-news/singleview/article/elektronische-haut-physikerin-der-tu-graz-entwickelt-multisensorisches-hybridmaterial0/

New Silicon Nanowires can Really Take the Heat

A game-changing discovery could speed up computer processors simply by conducting more heat. A research team has demonstrated an ultrathin silicon nanowire that conducts heat 150% more efficiently than conventional materials used in advanced chip technologies. The device could enable smaller, faster, energy-efficient microelectronics.

Electronic devices powered by microchips that efficiently dissipate heat would in turn consume less energy, an improvement that could help mitigate the consumption of energy produced by burning carbon-rich fossil fuels that have contributed to global warming.

"By overcoming silicon's natural limitations in its capacity to conduct heat, our discovery tackles a hurdle in microchip engineering," said Junqiao Wu, the scientist who led the Physical Review Letters study reporting the new device. Wu is a faculty scientist in the Materials Sciences Division and professor of materials science and engineering at UC Berkeley.

The device (an ultrathin silicon nanowire) could enable smaller, faster microelectronics with a heat-transfer-efficiency that surpasses current technologies. Electronic devices powered by microchips that efficiently dissipate heat would in turn consume less energy which is an improvement that could help mitigate the consumption of energy produced by burning carbon-rich fossil fuels that have contributed to global warming.

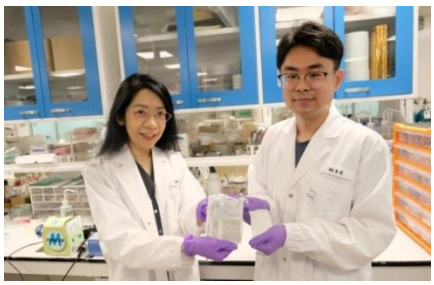
Junqiao Wu (from left) and Joel Ager. (Credit: Thor Swift/Berkeley Lab; photo of Joel Ager courtesy of UC Berkeley).

Source and image credit: https://newscenter.lbl.gov/2022/05/17/silicon-nanowires-take-the-heat/

Scientists Develop a 'Fabric' that Turns Body Movement into Electricity

Scientists have developed a stretchable and waterproof 'fabric' that turns energy generated from body movements into electrical energy. Scientists at Nanyang Technological University (NTU), Singapore (NTU Singapore) have developed a stretchable and waterproof 'fabric' that turns energy generated from body movements into electrical energy. A crucial component in the fabric is a polymer that, when pressed or squeezed, converts mechanical stress into electrical energy. It is also made with stretchable spandex as a base layer and integrated with a rubber-like material to keep it strong, flexible, and waterproof. In a proof of concept experiment reported in the scientific journal Advanced Materials in April, the NTU Singapore team showed that tapping on a 3cm by 4cm piece of the new fabric generated enough electrical energy to light up 100 LEDs. Washing, folding, and crumpling the fabric did not cause any performance degradation, and it could maintain stable electrical output for up to five months, demonstrating its potential for use as a smart textile and wearable power source.

Materials scientist and NTU Associate Provost (Graduate Education) Professor Lee Pooi See, who led the study, said: "There have been many attempts to develop fabric or garments that can harvest energy from movement, but a big challenge has been to develop something that does not degrade in function after being washed, and at the same time retains excellent electrical output. In our study, we demonstrated that our prototype continues to function well after washing and crumpling. We think it could be woven into t-shirts or integrated into soles of shoes to collect energy from the body's smallest movements, piping electricity to mobile devices." The electricity-generating fabric developed by the NTU team is an energy harvesting device that turns vibrations produced from the smallest body movements in everyday life into electricity. The prototype fabric produces electricity in two ways: when it is pressed or squashed (piezoelectricity), and when it comes into contact or is in friction with other materials, such as skin or rubber gloves (triboelectric effect).



Professor Lee Pooi See (on left) and doctorate student Jiang Feng from NTU showing samples of the material their team developed.

Source and image credit: https://www.todayonline.com/singapore/ntu-scientists-develop-new-fabric-turns-body-movement-electricity-1914501

FORTHCOMING TECH EVENTS

PAKISTAN

- 1st International Symposium on Frontiers in Computational Chemistry
  July 4 – 5, 2022, University of Agriculture, Faisalabad
  http://uaf.edu.pk/downloads/events/2022/IMG-20220614-WA0000.jpg

- International Workshop on 2D Materials & Quantum Effect Devices
  July 19, 2022, PIEAS, Islamabad
  http://www.pieas.edu.pk/proclaim-detail.cshtml?ProclaimId=100

- Pakistan's Socio-Economic Outlook: The Way Forward
  July 20, 2022, PIDE, Islamabad
  https://pide.org.pk/webinar/pides-1st-students-conference/

- International Conference on Strengthening Teaching and Research Capacity: Collaborative Partnership in Social Sciences
  August 16 – 18, 2022, Fatima Jinnah Women University, Rawalpindi
  https://www.fjwu.edu.pk/fjwu-events/international-conference-on-strengthening-teaching-and-research-capacity-collaborative-partnership-in-social-sciences/

- 1st National Conference on New Horizons of Botany in Pakistan
  August 22 - 24, 2022, Ghazi University, Dera Ghazi Khan
  http://www.gudgk.edu.pk/events/92

INTERNATIONAL

- 4th International Conference on Research in Engineering, Technology and Science (ICRETS)
  July 01 - 04, 2022, Baku, Azerbaijan
  https://www.2022.icrets.net/

- International Space Station Research and Development Conference (ISSR&D)
  July 22 – 25, 2022, Washington, DC, USA
  https://www.issconference.org/

- Second International Conference on Applications of Radiation Science and Technology (ICARST-2022)
  August 22 - 26, 2022, Vienna, Austria
  https://www.iaea.org/events/icarst-2022

- 2nd International Conference on Basic Sciences, Engineering and Technology (ICBASET)
  August 25 - 28, 2022, Istanbul, Turkey
  https://www.2022.icbaset.net/?l=en

- 26th International Conference on Science, Technology and Innovation Indicators, STI 2022
  September 7 – 9, 2022, Granada, Spain
  https://sti2022.org/venue/

TECH AND TRADE OFFERS

Standard Salt (Himalayan Edible Salt Exporters)

About Standard Salt

Standard Salt cares about improving the quality of life, in terms of health or lifestyle. We are focused on providing the best salt products to our consumers' right from the heart of Himalayan Salt Range. We invest heavily in making better approaches to serve our clients, regardless of whether it's creating inventive strategies to lift the quality of our all-natural salts, or improving our delivery and appropriation procedures to address your issues.

Our products

- **Himalayan Edible Salt**

We are leading Himalayan Manufacturer and Exporters of Edible Rock Salt in Bulk. We provide wholesale prices of Himalayan salt edible from Pakistan to the international salt business markets.

- **Himalayan Salt Bricks and Lamps**

Himalayan Salt bricks, lamps and tiles have now become an essential part of wall adornments. Standard Salt made it simple for you to plan your home in an extraordinary and healthy manner.

Contact us:
Address: T No. 5, Band Road, Gulshan-e-Ravi, Lahore, Punjab, Pakistan.
Cell: +92 42 37140055
Email: info@standardsalt.com.pk
Web: https://standardsalt.com.pk/

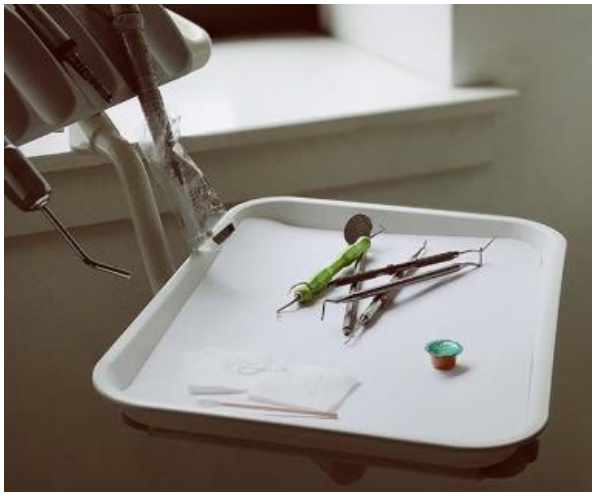
Aver Surgical Industry

About Aver Surgical Industry

We are manufacturer and exporter of high quality surgical, dental and beauty instruments. We are capable to produce the quality products according to your design.

Our products

We deal in all types of surgical instruments, dental instruments and beauty instruments. Feel free to contact us for a wide range of surgical instruments including excavators, hospital ware, plaster instruments, biopsy instruments, forceps etc. Our dental instruments include, chisel, files, curettes, instruments for root fragments, gouges, mouth gauges, probes, plastic filing instruments, delicate hooks etc.



Contact us:

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Cell: +923044413519
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About PASTIC

PASTIC serves as a gateway for Scientific & Technological Information for R&D by catering to the information needs of researchers, entrepreneurs, industrialists, educationists, policy makers and planners through anticipatory and responsive information services.

Technology Information Section works exclusively for support and promotion of technological information on trade and industry in the country.

"Technology Roundup" is a news bulletin that provides latest and innovative technology news, forthcoming events, etc. It also promotes products, technologies and services globally in sectors such as Agro Industry, Bio-Technology, Building Material, Business, Chemicals, Electronics, Energy, Fisheries, Food Processing, Machinery, Packaging, Mining, Pharmaceuticals and Textiles.

Please give us your feedback and address queries to tis.pastic@gmail.com