Technology Roundup

A NEWS BULLETIN

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Forthcoming Tech Events

1st International Nursing Research Conference (NRCON International 2022)

20th International and 32nd National Chemistry Conference on Chemical Sciences and Sustainable Development Goals

Nurturing for Transforming Lives: The Power of Early Childhood Development

5th NED International Textile Conference (NEDITC 2022)

1st International Conference on Climate Change: (ICCC-2022)

International Conference on Sustainable Engineering and Development

2nd International Conference on Gender and Social Sciences: Diversity, Challenges & Opportunities

7th Multi Disciplinary Student Research International Conference

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- Engineered Mosquitoes that Can't Spread Malaria

Tech & Trade Offers

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IT Ministry and Ignite Launch 6th National Incubation Center in Hyderabad

The Ministry for Information Technology and Telecommunication (MoITT) and Ignite National Technology Fund launched their 6th National Incubation Center (NIC) in Hyderabad. Federal Minister for IT & Telecommunication, Syed Amin-Ul-Haque, inaugurated the modern Incubation Center in Hyderabad. NIC Hyderabad will tap into the entrepreneurial potential of the young people in the city by providing them with a platform to work on their business ideas. NIC Hyderabad will be operated through the consortium of PTCL, LMKT, and Ideagist. Ignite has established the largest incubation network in Pakistan, which has incubated more than a thousand startups so far which have created around 115,000 jobs and raised funding of $73 million so far.

Speaking on the occasion Federal Minister for IT & Telecommunication, Syed Amin-Ul-Haque highlighted the importance of NICs. The key objective of this NIC program is to facilitate talented entrepreneurs and provide them with all necessary support for the transformation of their innovative ideas into a sustainable business. MoITT has established five incubation centers in Islamabad, Karachi, Quetta, Lahore, and Peshawar through Ignite and is also expanding its network to other cities. The establishment of National Incubation Center in Hyderabad will be a revolutionary step for the youth of Hyderabad and its surrounding rural and urban areas to transform the traditional business approach into a modern technology oriented one.

Image credit and source: https://propakistani.pk/2022/09/13/it-ministry-and-ignite-launch-6th-national-incubation-center-in-hyderabad/

Tesla Becomes Innovative Partner of Formula Electric Racing NUST

Taking a major stride forward, Formula Electric Racing NUST (FERN) from Pakistan Navy Engineering College (PNEC-NUST) has earned technical sponsorship by Tesla, one of the most valuable automotive brands that is accelerating the world's transition to sustainable energy with electric cars, solar and integrated renewable energy solutions and so on.

Tesla awards this sponsorship to Formula Student teams from around the world, and FERN is the first and only team from Pakistan to have been conferred this award. Apart from extending technical sponsorship, Tesla will also grant a discount of 5000 Euros on enepaq tinybms, ADI & TI, bms chips and dev boards to FERN.

FERN is a celebrated Formula Student team from Pakistan Navy Engineering College, one of the constituent colleges of NUST. The team has been working in electric propulsion since 2016. It has the unique honor of representing Pakistan in 5 Formula Student competitions and achieving the only podium finish for any Pakistani team.

6 years ago, NUST's five-person team of undergrad students made Pakistan's first ever Formula Electric Car, making Pakistan one of the 6 countries to be a part of the Formula SAE Lincoln 2016 competition. While 30 teams from 6 countries were able to qualify for the competition, FERN emerged as the only team representing not only Pakistan but entire Asia.

FERN is also the first team to work on Driverless Vehicles in Pakistan. The collaboration with Tesla will certainly benefit FERN in accomplishing bigger milestones in the global automotive market.

Image credit and source: https://nust.edu.pk/news/tesla-becomes-innovative-partner-of-formula-electric-racing-nust/ and https://www.techjuice.pk/tesla-and-nust-collaborates-to-level-up-racing-ev-production-of-fern/

Pakistani Woman in Canada's top 25 Women in Artificial Intelligence

Maria Abrar a Pakistani Women, has been ranked number 10 in the list of Canada's top 25 Women in Artificial Intelligence. This list is created by ReWork, an Artificial Intelligence (Al) and deep learning content producer based out of London, United Kingdom. The list contained names of Canada's top 25 Women in artificial intelligence. Maria, a Pakistani data scientist who has a long and successful career found herself at the 10th position.

Maria Abrar, by profession a Data Scientist, currently works at Meta Reality Labs in Toronto as a Senior Data Scientist after joining the company in 2021. Maria holds an extensive experience of 14 years in her current field and has worked with companies such as VEON, Trulioo and Oliver Solutions. Apart from working with Canadian companies, Maria has also worked with Telenor and Jazz, the cellular service providers. Over the course of her career, Maria trained a number of data scientists through her knowledge in artificial intelligence. She has also offered her services to a long list of countries which include Pakistan, Ukraine, Bangladesh, Russia, Italy and Canada. Maria also holds boundless experience working with Marketers, Product Managers and Relevant Professionals. Maria's aims are as high as her actions, she has already formed future roadmaps and business strategies, that will lead her to more success. In addition to this she has also developed a wide range of expertise in social network maps, product recommendation engines, estimating customer usage pattern, revenue and in-depth behavioral segmentation.

Image credit and source: https://www.techjuice.pk/pakistani-women-enters-the-list-of-canadas-top-25-women-in-artificial-intelligence/#:~:text=Maria%20Abrar

Pakistan Gets Automated Tool for Water Distribution

Pakistan has attained an automated system to determine water shares among the provinces, water availability forecasting, system losses and gains. The Indus River System Authority (IRSA) will switch over from a manual system to an automated one from the coming Rabi season. The automated system has been named as Water Apportionment Accord (WAA) Tool.

The software tool has been developed jointly by collaboration between the Ministry of Water Resources (MoWR), IRSA, WAPDA, Provincial Irrigation Departments (PIDs) and the Australian Government through Commonwealth Scientific and Industrial Research Organization (CSIRO) and Australian Centre for International Agricultural Research (ACIAR). The software tool remained operational for the last three years parallel with the manual system of IRSA and it has been found 100 percent correct. Now IRSA has decided to switch over from the incoming Rabi season, to the WAA Tool, the automated system, from its conventional method based on manual inputs both in Mangla and Tarbela dams. The automated system has been developed to bring consistency, transparency and ensure equity in the distribution of surface supplies of the IBIS (Indus Basin Irrigation System) between the signatories of the WAA, capturing complex IBIS river and reservoir operations and automizing them into a user-friendly software tool and capacity building of stakeholder organizations.

Image credit: https://gnnhd.tv/news/5164/tarbela-dam-tops-installed-capability-produces-4993-mw-of-electricity
Source: https://www.thenews.com.pk/print/991333-new-system-to-determine-provinces-water-share

Balochistan Termed Fertile for Organic Cotton

Pakistan Organic Cotton Programme in collaboration with the Agriculture Extension Department (AED), organized a seminar on 'Organic Cotton Production in Balochistan' to mark World Cotton Day.

The seminar was held at the University of Balochistan (UoB), Quetta. People from different walks of life including the representatives of textile groups, professionals from the agriculture field, researchers, students, and farmers' representatives participated in the seminar.

Director General Balochistan Agriculture Research Institute, Inamul Haq, Vice Chancellor (VC) of the UoB Dr. Shafiqur Rehman and Pro VC Dr. Syed Ainuddin joined and bestowed the seminar. In the seminar it was highlighted that the organic cotton production system has positive impacts on the environment, farmers' livelihood and the national economy. Due to its climate and vast areas of virgin land, Balochistan has great potential for the cultivation and promotion of organic cotton. Furthermore, the seminar also focused on scope, potential, and challenges being faced in promoting organic cotton in the province. The seminar concluded that organic farming promotes biodiversity and benefits the ecosystem as it discourages the use and application of Genetically Modified Organisms (GMSs), synthetic pesticides, and fertilizers, which are hazardous for human health and our environment. As Pakistan has been facing the worst consequences of climate change, we must revert back to sustainable practices in agriculture and other sectors to withstand and minimize the disastrous effects of climate change.

Image credit and source: https://tribune.com.pk/story/2380804/balochistan-termed-fertile-for-organic-cotton

CDA to Launch Electric Buses for Public Transport in Islamabad

Capital Development Authority (CDA) will soon launch electric buses for the intra-city commute. According to CDA officials, electric buses will run on 6 different public transport routes. The department will also provide space for charging stations for the buses. The first batch of electric buses will reach Islamabad by the end of December.

The launch of electric buses has been on CDA's agenda for the past few years. The department also began testing these buses in the twin cities a few days ago.

CDA is preparing to launch 13 new bus routes in two phases. According to Captain (retired) Usman Younis, Chairman CDA, the first phase will see the provision of transport on six congested routes. In the second phase, the administration will procure buses for seven additional routes. CDA will also start a route from Faizabad to Pir Wadhai once the IJP road is completed and PIMS will serve as the new routes' hub, linking the service to Red Line and Orange Line Metro buses. The department states that its aim is to reduce people's reliance on private means of transportation to save fuel costs and the environment.

Featured image is only for illustration purposes.

Image credit: https://www.aboutpakistan.com/news/cda-to-purchase-29-electric-buses-for-three-separate-routes-in-islamabad/

Source: https://propakistani.pk/2022/10/07/cda-set-to-launch-electric-buses-for-public-transport-in-islamabad/

Third Power Plant Launched on Thar Coal in Sindh

Pakistan has successfully launched a third power plant with the capacity of 330 megawatts on the indigenous Thar coal, helping the country to produce electricity at a significantly lower cost, cutting energy import bills and saving foreign exchange reserves.

This is the third plant on local coal (dirty fuel) operating within the mine vicinity in Tharparker district in Sindh. Accordingly, the total installed power production capacity increased to 990 megawatts on Thar coal in three-years to date.

Power production on Thar coal stands as the third cheapest source among as many as 124 plants operating on various fuels including gas, RLNG and oil in the country, according to the latest government merit order dated September 16, 2022. According to the National Transmission and Despatch Company (NTDC), the power production on Thar coal costs Rs. 4.39 per unit at present. This is including fuel (coal) costs at Rs. 3.74 per unit. The merit order suggests that high-speed diesel is the most expensive fuel used to produce electricity, costing Rs. 75.04 per unit at present. The government, however, will first fully utilize the low-cost fuel-run plants to meet local demand and only take production from other expensive plants in case demand spikes.

It has been learnt that Pakistan has 175 billion tonnes of coal reserves in Tharparkar alone, equivalent to 50 billion tonnes of oil equivalent (TOE) which is more than Saudi Arabian and Iranian oil reserves. The reserves equal to 2,000 trillion cubic feet (TCF) of gas which is 68 times higher than Pakistan's total gas reserves. Thar coal can meet Pakistan's electricity demand for several centuries and, as all the coal reserves will not be utilized for power production, there could be many other uses for the excess coal.

Image credit and source: https://tribune.com.pk/story/2379519/third-power-plant-launched-on-thar-coal

Public Offices to go Solar in Rawalpindi, Punjab

In view of the considerable reduction in electricity bills, the government has decided the transition of all government institutions including the Commissioner's office, Deputy Commissioner's office, CPO, RPO, Rawalpindi Development Authority (RDA), Water & Sanitation Agency (WASA), Parks and Horticulture Authority (PHA) and 32 police stations toward solar energy in Rawalpindi District.

Rs. 500 million have been allocated for this purpose in the initial phase following which WASA's all 450 tube wells will also be shifted to solar energy in a phased manner. With this initiative, these institutions and the Punjab government will save billions of rupees annually.

It has been decided to launch the project in November. The district administration and the authorities of all these institutions have started preparations for this project in which solar energy devices will be officially installed in public institutions.

Image credit and source: https://tribune.com.pk/story/2380797/public-offices-to-go-solar-in-rawalpindi

Pakistan Bags Three Awards for Nuclear Advancement Contribution

Pakistan has received three Regional Cooperation Agreement (RCA) awards in Vienna, Austria, both for the institutional category and the individual category.

Regional Cooperative Agreement (RCA) of the International Atomic Energy Agency (IAEA) recognized achievements of Pakistan Atomic Energy Commission (PAEC) on its 50th Anniversary. A ministerial level meeting was organized by the International Atomic Energy Agency (IAEA) to celebrate the 50th anniversary of the Regional Cooperative Agreement (RCA). During this event, various awards were conferred to recognize contributions to the RCA program. Pakistan had the distinction to receive three awards in individual and institute categories respectively at the event held in Vienna, Austria.

In the institute category, Pakistan Institute of Nuclear Science and Technology (PINSTECH) was recognized for its contributions in various areas of applications of nuclear science and technology including Isotope Hydrology, Water Resources Management, Industry and Air & Marine Pollution.

In the individual category, two Pakistani scientists were conferred RCA Project Awards. Dr. Azam Tasneem, Chief Scientist (Retd.), PINSTECH, was recognized for his work as Lead Country Coordinator in the areas of Isotope Hydrology and Water Resource Management. Also, Dr. Irfan Ullah, Dy. Chief Scientist, Institute of Nuclear Medicine & Oncology (INMOL) was awarded for his contribution in the areas of cancer diagnosis and treatment. The RCA is a formal inter-governmental agreement which serves as a framework for the Asia Pacific Region to intensify collaboration through programmes and projects focused on the specific shared needs of its 22 member countries in the field of nuclear science and technology.

Image credit and source: https://www.nation.com.pk/29-Sep-2022/pakistan-bags-three-awards-for-nuclear-advancement-contribution

Special Programme for G-B Schoolchildren Inaugurated

Gilgit-Baltistan (G-B) Chief Minister Khalid Khursheed inaugurated a special programme for the teaching of Computer Science, STEM and entrepreneurship in government schools all across the region.

This is the first of its kind programme in Pakistan where 100 expert technology fellows will be trained by private service provider to teach these courses in 200 public schools all across G-B.

This programme will be the start of a STEM revolution in the public sector education of Pakistan. Through this programme, students from grades six to eight will be taught computer science, STEM and Entrepreneurship.

Under STEM, through integrated project-based learning, students will be taught about latest technologies, science, engineering and mathematics. The students will make multiple hands on projects and they will use the latest Learning Management System (LMS) as aid in learning.

The Entrepreneurship course is being introduced for the first time in Pakistan. A specially designed curriculum is being developed to promote entrepreneurship and business sense amongst students so that they can become job creators rather than job seekers.

Image credit and source: https://tribune.com.pk/story/2378397/first-of-its-kind-special-programme-for-g-b-schoolchildren-inaugurated

Chinese, Pakistani Universities to Build Research Center on Food Security, Plant Biotech

A Chinese research university and a Pakistani university are to jointly build a research centre on food security and plant biotechnology, as per Dr. Wang Depeng, Professor at the College of Life Science of Linyi University.

In recent years, a growing number of Chinese and Pakistani researchers have jointly conducted research projects to mitigate the effects of worsening climate change. Last year, Dr. Wang together with Pakistani and Turkish scientists published four English monographs on climate-smart agriculture and climate-resilient crops as the world is struggling to maintain and increase agriculture production.

The research centre is part of the Memorandum of Understanding (MoU) to be signed between Linyi University and Pakistan's Abdul Wali Khan University. Under the MoU, the research centre and laboratories which will be established at Linyi University will focus on the disciplines of biotechnology, agronomy and food sciences. Both sides will also recruit researchers from respective universities to work in the research centre and supervise student researchers.

Two joint research groups will be formed to conduct research of mutual interests and a joint training programme of M. Phil and Ph. D students will also be offered.

Image credit and source: https://www.pakistantoday.com.pk/2022/09/23/chinese-pakistani-universities-to-build-research-center-on-food-security-plant-biotech/

New Technology to Ease Drinking Water Shortage in Flood Affected Areas

Experts urged government and philanthropists to invest in cost-effective floodwater purification filters developed by the Pakistan Council of Research in Water Resources (PCRWR) that are based on modern technical equipment and helpful in mitigating water shortage and health issues due to stagnant water in flood affected areas. The PCRWR, in the wake of unprecedented torrential rains, that inundated one-third of the country, had built most modern water purification plants that are portable and easy to operate and maintain system sufficient to meet drinking water needs of a limited population in a union council.

The water filtration plants are based on solar power and manual mechanism based on the area needs and population capacity to handle the equipment. The Council through its regional offices had provided few filtration plants in Balochistan and Sindh to utilize the floodwater for drinking and domestic purposes.

The solar water purification filter had a solar panel plate of almost 280 watts used to provide power to run the suction machine to supply flood water to the purification filters that used to capture turbidity, mud, microbes and bacteria.

The solar-based filter could purify 1,500 liters of floodwater per hour. However, the manual filter as compared to the solar based only had a PLP wheel and a handle attached to it for drawing water into the filters whereas the rest of the technology was the same. This manual filter could purify 1,200 liters of contaminated water per hour.

Image credit: https://pcrwr.gov.pk/pakistan-water-week-2022/

Source: https://www.nation.com.pk/23-Sep-2022/new-technology-to-ease-drinking-water-shortage-in-flood-affected-areas#:~:text=The%20solar%20water%20purification

German Software Development House Planned in Pakistan

Leading German software corporation SAP, announced plans to set up a software development house in Pakistan with a capacity to train 5000 students.

At present, SAP is providing digital solutions to leading Pakistani companies in the public and private sector, enabling them to achieve higher growth. All major systems-related companies in Pakistan including Systems Limited, IBM and Siemens work with SAP.

SAP Country Managing Director, Saquib Ahmad explained that the company was in the process of acquiring regulatory approval to set up a Software Development Centre in Pakistan. While responding to a question regarding the security of sensitive information, he underscored that, SAP ensures and controls security at all levels. We guarantee full compliance with all governmental protocols and ensure that all relevant information stays within Pakistan. SAP had witnessed double digit growth every year in Pakistan. Profits of our customer companies also increased as they expanded and achieved export targets due to the implementation of digital solutions.

Digital transformation could help create a larger international footprint for Pakistan. While the company has yet to identify a place at which the centre would be set up, however it would create job opportunities for the Pakistani youth.

Image credit and source: https://tribune.com.pk/story/2377876/software-development-house-planned

Biggest-Ever Glacier Mapping Project To Be Launched In Pakistan

The United Nations (UN) aims to set up a system that will map the glaciers in Pakistan's northern areas to determine how rapidly the ice is melting. A system of early warning may be developed to avert tragedies like the recent floods.

According to Knut Ostby, a representative of the UN Development Program (UNDP) in Pakistan, the organization would map 5,000 glaciers over the following 1.5 years. Pakistan is the country having highest number of glaciers.

A system of early warning may be developed to avert tragedies like the recent floods. It is a top priority work, since the melting of glaciers and the consequent formation of many lakes in the mountains has significantly increased the risk of flooding in the area. In the snow-covered Hindu Kush-Himalaya-Karakoram Mountains in South Asia, which are thought to be the largest repository outside the north and south poles, there is a permanent ice cap and permafrost of the Earth, known as the third pole.

The project will aid in developing comprehensive solutions to prevent the melting of this third pole as more than 110 valleys in Pakistan need this warning system.

Image credit and source: https://www.samaaenglish.tv/news/40018042

Chinese Company to Establish Automatic Weather Station in Pakistan

Chinese meteorological company will set up an automatic weather station and is looking forward to building meteorological labs in Pakistan. According to Zhuge, CEO of ZOGLAB, a professional Chinese manufacturer specialized in instruments for atmosphere and environment, provision of automatic weather stations (AWS) and technologies is being planned. If conditions permit, meteorological labs with Pakistani partners will also be built.

The quantity and quality of meteorological equipment in China top the world. For customers in South and Southeast Asia, Chinese meteorological equipment is more cost-effective compared with similar products with the same index and precision manufactured in the US and European countries.

According to the CEO, Pakistan and China can also collaborate to establish meteorological standards to improve the accuracy of the data acquired by the existing weather stations.

Taking a step further, China can provide the meteorological radars, satellite receivers, etc. to Pakistan to set up a three-dimensional meteorological observation system that covers equipment on the ground, in the sea, in the air and in the space.

Image credit and source: https://www.pakistantoday.com.pk/2022/09/06/chinese-company-to-establish-automatic-weather-station-in-pakistan/

Flying Car Takes Off in Dubai

Dubai witnessed a historic moment in what could be the future of travel and public transport. Xpeng, Chinese technology and electric vehicle manufacturer, made the first successful global public flight of its X2 flying car.

The autonomous two-seater flying car has 760 kg of maximum take-off weight and 560 kg empty weight with a maximum flight speed of 130 km per hour. Made from premium carbon fiber material and equipped with an airframe parachute, it offers 35 minutes of flight. The futuristic electric vertical takeoff and landing vehicle (eVTOL) is equipped with an intelligent flight control system and autonomous flight capabilities and is the latest generation of the flying car. The X2 emits zero carbon dioxide and is designed with low-altitude city capabilities. Dubai International Chamber has been working closely with XPeng to explore wider international markets using Dubai as a gateway.

The test flight was conducted on the sidelines of the Gitex Global 2022, which is taking place at the Dubai World Trade Centre Earlier this year, senior UAE officials visited Xpeng facilities in Guangzhou, China, and invited the company to choose the UAE to expand its market. Dubai Civil Aviation Authority is working with the company and shares its feedback regularly with Xpeng, which is taking feedback very actively.

Image credit and source: https://www.khaleejtimes.com/transport/watch-flying-car-takes-off-in-dubai-can-cruise-at-top-speeds-of-130kmph

BioNTech Founders Predict Cancer Vaccine is Only Years Away

The husband and wife team who co-founded BioNTech, the biotechnology company that partnered with Pfizer to develop an effective messenger-RNA (mRNA) shot against COVID-19, has predicted that a cancer vaccine could be widely available within the next decade. BioNTech originally focused on developing mRNA-based technologies for a patient-specific approach to cancer treatment.

According to Professor Ugur Sahin, the cancer vaccine, which would build upon breakthroughs achieved by the scientists during the development of the COVID-19 shot, may be widely available within just eight years.

The hope is that a vaccine currently in development would train the body to recognize and attack cancers using mRNA technology. The goal that we have is that can we use the individualized vaccine approach to ensure that directly after surgery, patients receive a personalized, individualized vaccine, and we induce an immune response that so the T-cells in the body of the patient can screen the body for remaining tumor cells and ideally eliminate the tumor cells.

it remains to be seen how doctors would use other types of medical interventions in combination with the vaccine and what else needs to be tweaked to ensure that patients are cured.

Image credit and source: https://www.sciencealert.com/biontech-founders-predict-cancer-vaccine-is-only-years-away

World's First Flying Bike Makes its Debut in US Auto Show

A flying bike made by Japanese startup AERWINS Technologies made its debut in the United States at the Detroit Auto Show, touted as the world's first flying bike. The manufacturers have plans to launch the model next year. The flying bike has been named as XTURISMO hoverbike.

The XTURISMO hoverbike can fly for 40 minutes with a speed limit of up to 100 kph (62 miles per hour). According to the founder and CEO of AERWINS, Shuhei Komatsu, the company is planning to sell a smaller version in the US in 2023.

This hoverbike comes with a huge price of $777,000. However, AERWINS founder said that the company is trying to cut down the cost to $50,000 for a smaller, electric model but it will take 2-3 years and will be ready by 2025.

Co-chair of the Detroit Auto Show, Thad Szott, who took the bike for a test flight, said that the experience of riding a hoverbike was comfortable and exhilarating and felt like it was something straight out of a science fiction movie.

Image credit and source: https://www.indiatoday.in/business/story/world-first-flying-bike-us-auto-show-2000916-2022-09-16

A 10 Story Building Constructed in a Record 28 Hours Time

Built-in Changsha city China, the building first became news when developers “Broad Group” published a 45-minute long YouTube video that explained the building’s construction and the audience was surely amazed by the speed.

Even the fastest of skyscrapers require some weeks to be built from the ground up. So what did Broad Group do that it was able to create a building so high in much less time? Well, they used prefabricated construction systems.

A newer and more effective way to create buildings, prefabricated buildings are designed in several different modules, all to be joined together and create a building. These are first created in a factory and are then transported turn by turn to the construction site, each module is kept and joined onto the last one until the building completes.

Despite the fact that the building Broad Group created was built using prefabricated construction systems, the speed and efficiency at which their workers put together the bolts and joints, ran electric wires and provided water connections at each separate level is admirable. While many may think of prefabricated buildings to be weak or something that would eventually get destroyed, but it’s quite the opposite of what we would expect it to be. The prefabricated building stands firm like any other building and is even earthquake-proof. The best part about this building is you could simply disassemble it and transport it to another location too.

Image credit and source: https://www.techjuice.pk/developers-in-china-constructs-10-story-building-in-a-record-28-hours/

MOXIE Experiment Reliably Produces Oxygen on Mars

Day and night, and across seasons, the instrument generates breathable oxygen from the Red Planet's thin atmosphere.

On the red and dusty surface of Mars, nearly 100 million miles from Earth, an instrument the size of a lunchbox is proving it can reliably do the work of a small tree. Researchers report that, MOXIE was able to produce oxygen on seven experimental runs, in a variety of atmospheric conditions, including during the day and night, and through different Martian seasons. In each run, the instrument reached its target of producing six grams of oxygen per hour, about the rate of a modest tree on Earth. Researchers envision that a scaled-up version of MOXIE could be sent to Mars ahead of a human mission, to continuously produce oxygen at the rate of several hundred trees.

Despite the necessary compromises in MOXIE's current design, the instrument has shown it can reliably and efficiently convert Mars' atmosphere into pure oxygen. It does so by first drawing the Martian air in through a filter that cleans it of contaminants. The air is then pressurized, and sent through the Solid OXide Electrolyzer (SOXE), an instrument developed and built by OxEon Energy, that electrochemically splits the carbon dioxide-rich air into oxygen ions and carbon monoxide. The oxygen ions are then isolated and recombined to form breathable, molecular oxygen, or O2, which MOXIE then measures for quantity and purity before releasing it harmlessly back into the air, along with carbon monoxide and other atmospheric gases.

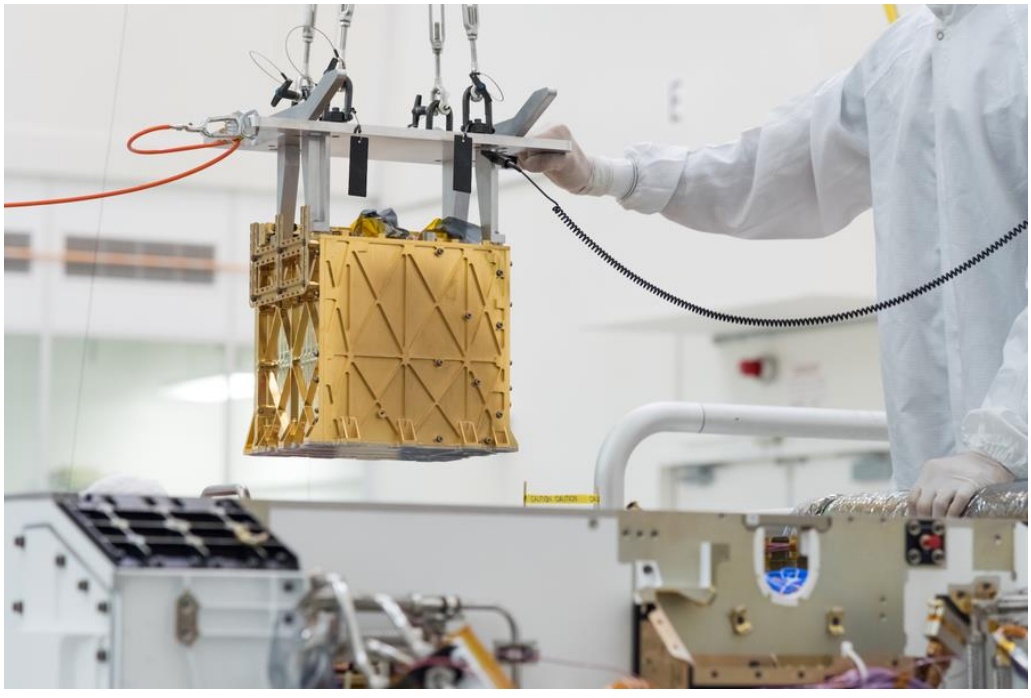


Image credit and source: https://news.mit.edu/2022/moxie-oxygen-mars-0831

A New Holographic Microscope Allows Seeing Through the Skull

Researchers of the Institute for Basic Science, The Catholic University of Korea, and Seoul National University developed a new type of holographic microscope. The new microscope can achieve “see through” the intact skull and is capable of high resolution 3D imaging of the neural network within a living mouse brain without removing the skull. In order to scrutinize the internal features of a living organism using light, it is necessary to deliver sufficient light energy to the sample and accurately measure the signal reflected from the target tissue. However, in living tissues multiple scattering effects and severe aberration tend to occur when light hits the cells, which makes it difficult to obtain sharp images. In complex structures such as living tissue, light undergoes multiple scattering, which causes the photons to randomly change their direction several times as they travel through the tissue.

The research team managed to quantitatively analyze the interaction between light and matter. In this recent study, the researchers reported the successful development of a super depth, three-dimensional time-resolved holographic microscope that allows for the observation of tissues to a greater depth than ever before. The researchers devised a method to preferentially select single-scattered waves by taking advantage of the fact that they have similar reflection waveforms even when light is input from various angles. This is done by a complex algorithm and a numerical operation that analyzes the eigenmode of a medium between wavefronts of light. This enabled the new microscope to focus more than 80 times of light energy on the neural fibers than before, while selectively removing unnecessary signals. This allowed the ratio of single-scattered waves versus multiple-scattered waves to be increased by several orders of magnitude.

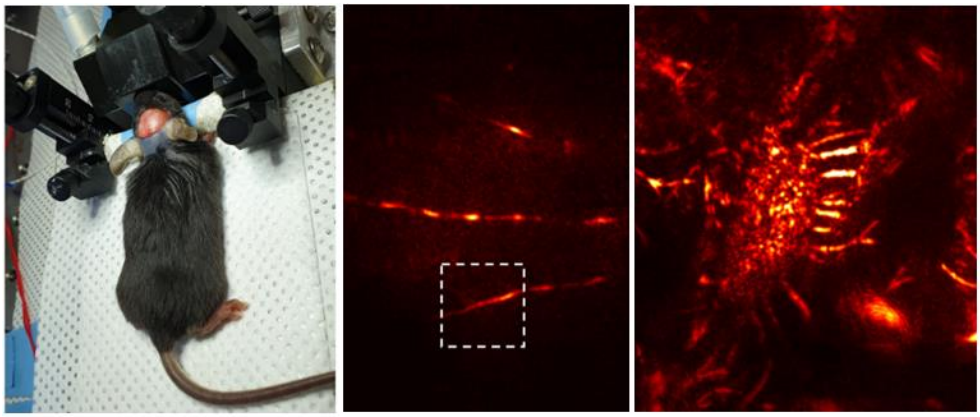


Image credit and source:
https://www.ibs.re.kr/cop/bbs/BBSMSTR_000000000611/selectBoardArticle.do?nttId=22043

Disposable Electronics on a Simple Sheet of Paper

Discarded electronic devices, such as cell phones, are a fast-growing source of waste. One way to mitigate the problem could be to use components that are made with renewable resources and that are easy to dispose of responsibly. Now, researchers reporting in ACS Applied Materials & Interfaces have created a prototype circuit board that is made of a sheet paper with fully integrated electrical components, and that can be burned or left to degrade.

To use paper-based circuit boards, is easier to dispose of, less expensive and more flexible. However, current options require specialized paper, or they simply have traditional metal circuitry components mounted onto a sheet of paper.

The researchers designed a paper-based amplifier-type circuit that incorporated resistors, capacitors and a transistor. They first used wax to print channels onto a sheet of paper in a simple pattern. After melting the wax so that it soaked into the paper, the team printed semi-conductive and conductive inks, which soaked into the areas not blocked by wax. Then, the researchers screen-printed additional conductive metal components and casted a gel-based electrolyte onto the sheet.

Tests confirmed that the resistor, capacitor and transistor designs performed properly. The final circuit was very flexible and thin, just like paper, even after adding the components. To demonstrate the degradability of the circuit, the team showed that the entire unit quickly burned to ash after being lit on fire.

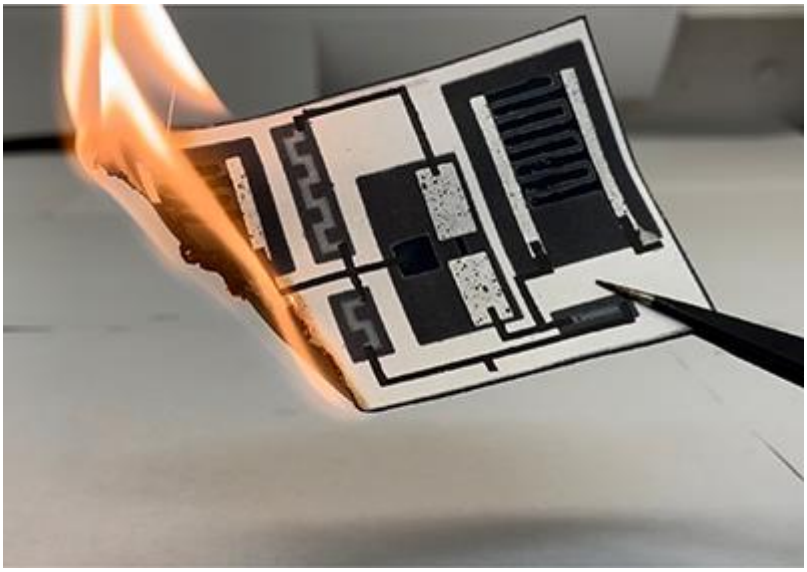


Image credit and source:
https://www.acs.org/content/acs/en/pressroom/newsreleases/2022/october/disposable-electronics-on-a-simple-sheet-of-paper.html

Modified Microwave Oven Cooks up Next-gen Semiconductors

A household microwave oven modified by a Cornell Engineering professor is helping to cook up the next generation of cell phones, computers and other electronics after the invention was shown to overcome a major challenge faced by the semiconductor industry.

The prototype was built by James Hwang, a research professor in the Department of Materials Science and Engineering. Producing the materials that make up transistors and other microchip components is similar to baking, in that material ingredients must be mixed together and then heated, among other steps, in order to produce a desired electrical current. For instance, phosphorus is added to silicon and then the mixture is annealed, or heated, to position the phosphorus atoms into the correct place so that they are active in current conduction. But as microchips continue to shrink, the silicon must be doped, or mixed, with higher concentrations of phosphorus to produce the desired current. Hwang's modified microwave oven overcomes this challenge by using microwaves to activate the excess dopants. Just like with household microwave ovens that sometimes heat food unevenly, previous microwave annealers produced "standing waves" that prevented consistent dopant activation, but Hwang's prototype selectively controls where the standing waves occur. Such precision allows for the proper activation of the dopants without excessive heating or damage of the silicon crystal.

Image credit and source: https://news.cornell.edu/stories/2022/09/modified-microwave-oven-cooks-next-gen-semiconductors#:~:text=A%20household%20microwave%20oven%20modified,faced%20by%20the%20semiconductor%20industry.

Walking Micro-Robots having Electronic Brains

A collaborative effort has installed electronic “brains” on solar-powered robots that are 100 to 250 micrometers in size, smaller than an ant’s head, so that they can walk autonomously without being externally controlled.

Cornell University researchers and others have previously developed microscopic machines that can crawl, swim, walk and fold themselves up, there were always “strings” attached to generate motion, wires were used to provide electrical current or laser beams had to be focused directly onto specific locations on the robots. According to Itai Cohen, Professor of Physics in the College of Arts and Sciences, the invention of electronic brains in micro robots set the stage for a new generation of microscopic devices that can track bacteria, sniff out chemicals, destroy pollutants, conduct microsurgery and scrub the plaque out of arteries.

The “brain” in the new robots is a complementary metal-oxide-semiconductor (CMOS) clock circuit that contains a thousand transistors, plus an array of diodes, resistors and capacitors. The integrated CMOS circuit generates a signal that produces a series of phase-shifted square wave frequencies that in turn set the gait of the robot. The robot legs are platinum-based actuators. Both the circuit and the legs are powered by photovoltaics.

Dr. Alejandro Cortese, displaying a silicon-on-insulator wafer that contains finished CMOS “brains.”

Image credit and source: https://news.cornell.edu/stories/2022/09/brains-board-smart-microrobots-walk-autonomously

New Algorithms Help Four-Legged Robots Run in the Wild

A team led by the University of California San Diego has developed a new system of algorithms that enables four-legged robots to walk and run on challenging terrain while avoiding both static and moving obstacles. In tests, the system guided a robot to maneuver autonomously and swiftly across sandy surfaces, gravel, grass, and bumpy dirt hills covered with branches and fallen leaves without bumping into poles, trees, shrubs, boulders, benches or people.

The robot also navigated a busy office space without bumping into boxes, desks or chairs. The work brings researchers a step closer to building robots that can perform search and rescue missions or collect information in places that are too dangerous or difficult for humans.

The system provides a legged robot more versatility because of the way it combines the robot's sense of sight with another sensing modality called proprioception, which involves the robot's sense of movement, direction, speed, location and touch—in this case, the feel of the ground beneath its feet.

According to Xiaolong Wang, a professor of electrical and computer engineering at the UC San Diego Jacobs School of Engineering, most approaches to train legged robots to walk and navigate rely either on proprioception or vision, but not both at the same time. Moving forward, Wang and his team are working on making legged robots more versatile so that they can conquer even more challenging terrains including enabling a robot to walk up and down stairs, walk on stones, change directions and jump over obstacles.

Image credit: https://techxplore.com/news/2022-10-algorithms-four-legged-robots-wild.html

Source: https://today.ucsd.edu/story/new-algorithms-help-four-legged-robots-run-in-the-wild

Development of a Disposable Paper Battery

A study published in the journal Scientific Reports outlines a water-activated disposable paper battery. According to the scientists, it could be used to power a broad variety of low-power, single-use disposable electronics, such as smart labels for tracking items, environmental sensors, and medical diagnostic devices, thereby minimizing their environmental impact. The battery was developed by Gustav Nyström and colleagues, and it consists of at least one cell that is one centimeter squared and is made up of three inks that have been printed on a rectangular piece of paper. The paper strip is covered with sodium chloride salt, and one of its shorter ends has been dipped in wax.

One of the flat sides of the paper is printed with ink containing graphite flakes, which serves as the positive end of the battery (cathode). The other side is printed with ink containing zinc powder, which serves as the negative end of the battery (anode). In addition, on top of the other two inks, an ink containing graphite flakes and carbon black is printed on both sides of the paper. This ink links the battery's positive and negative ends to two wires positioned at the wax-dipped end of the paper. The salts in the paper dissolve when a small quantity of water is added, releasing charged ions. These ions spread across the paper to activate the battery, which causes the zinc in the ink at the negative end of the battery to release electrons. Attaching the wires to an electrical device closes the circuit so that electrons can be transferred from the negative end, via the graphite and carbon black, containing ink, wires, and device to the positive end (the graphite-containing ink) where they are transferred to oxygen in the surrounding air. These reactions generate an electrical current that can be used to power the device.

Image credit and source: https://scitechdaily.com/a-new-disposable-paper-battery-has-been-developed/

S. Korean Scientists Develop New Material That Produces 20 Times More Hydrogen Then Traditional Methods

Scientists in South Korea have developed a new material that can produce up to 20 times more hydrogen than conventional methods. Traditional hydrogen production often relies on the use of platinum, an expensive precious metal, the cost of which obviously reflects on the price of H2.

The team of South Korean researchers, however, has found a way to replace platinum in the electrolysis process with a different, far less costly material that can dramatically bring down the price of hydrogen.

The innovative method involves the 'carbonization' of fabric that is burnt at the temperature of 900°C, after which the fabric is dipped in a nickel metal solution and an electric current is applied.

As a result, the metal bonds with the cloth, a process known as electroplating, which turns the fabric into a new material that is more reactive. The carbonization at only 900°C as opposed to the usual temperature of 2,000°C, at which carbonization generally occurs, allows larger surfaces to be treated in this way.

Once the new material is formed, it is submerged water with an electric current running through it, causing bubbles of hydrogen to appear. The researchers found the amount of hydrogen produced with the help of this material was 20 times greater compared to the process that uses platinum.

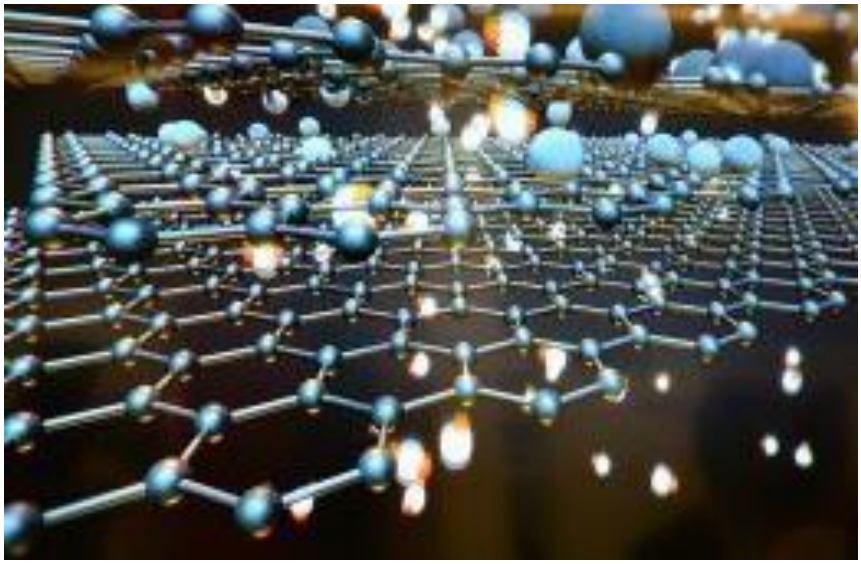


Image credit and source: https://fuelcellsworks.com/news/s-korean-scientists-develop-new-material-that-produces-20-times-more-hydrogen-than-traditional-methods/

Engineered Mosquitoes that Can't Spread Malaria

Scientists have engineered mosquitoes that slow the growth of malaria-causing parasites in their gut, preventing transmission of malaria to humans. At present, the technique has shown to dramatically reduce the possibility of malaria spread in a lab setting, but if proven safe and effective in real-world settings, it could offer a powerful new tool to help eliminate malaria.

The disease is transmitted between people after a female mosquito bites someone infected with the malaria parasite. The parasite then develops into its next stage in the mosquito's gut and travels to its salivary glands. However, only around 10% of mosquitoes live long enough for the parasite to develop far enough to be infectious.

The researchers of "Transmission:Zero" team at Imperial College London, genetically modified the main malaria-carrying species of mosquito in Africa. They were able to make it so that when mosquito takes a blood meal, it produces two molecules called "antimicrobial peptides" in its guts. These peptides, which were originally isolated from honeybees and African clawed frogs, impair the malaria parasite's development.

This caused a few days' delay before the next parasite stage could reach the mosquito salivary glands, by which time most mosquitoes in nature are expected to die. The peptides work by interfering with the energy metabolism of the parasite, which also has some effect on the mosquito, causing them to have a shorter lifespan and further decreasing their ability to pass on the parasite.

Image credit and source: https://www.imperial.ac.uk/news/239931/mosquitoes-that-cant-spread-malaria-engineered/

FORTHCOMING TECH EVENTS

PAKISTAN

- 20th International and 32nd National Chemistry Conference on Chemical Sciences and Sustainable Development Goals
  November 02 – 04, 2022, The Khwaja Fareed University of Engineering & Information Technology, Rahim Yar Khan
  https://kfueit.edu.pk/20th-international-and-32nd-national-chemistry-conference-chemical-sciences-and-sustainable-development-goals-organized
- 1st International Nursing Research Conference (NRCON International 2022)
  November 11 – 12, 2022, Liaqat University of Medical and Health Sciences, Jamshoro
  https://lumhs.edu.pk/nrcon2022/
- Nurturing for Transforming Lives: The Power of Early Childhood Development
  November 16 – 17, 2022, Islamabad
  https://ecdc.pafec.org/
- 5th NED International Textile Conference (NEDITC 2022)
  November 16 – 17, 2022, NED University of Engineering and Technology, Karachi
  https://neditc.org/
- International Conference on Sustainable Engineering and Development
  November 25 – 26, 2022, Marriott Hotel, Karachi
  https://www.neduet.edu.pk/sites/default/files/Events/13-10-2022/NED_IEPSDG_Conference_Tentative_Programme.pdf
- 1st International Conference on Climate Change: (ICCC-2022)
  November 28 – 30, 2022, The Islamia University of Bahawalpur
  https://www.iub.edu.pk/1st-international-conference-on-climate-change-iccc-2022
- 2nd International Conference on Gender and Social Sciences: Diversity, Challenges & Opportunities
  End of November, 2022, Lahore College for Women University, Lahore
  https://www.lcwu.edu.pk/news-aug2020/3078-2nd-international-conference-on-gender-and-social-sciences.html
- 7th Multi Disciplinary Student Research International Conference (MDSRIC)
  November 29 – 30, 2022, University of Wah, Wah Cantonment
  http://uow.edu.pk/ORIC/MDSRIC/MDSRIC22
- 4th International Conference on Sustainable Energy Technologies (ICSET 2022)
  December 5th 2022, University of Engineering and Technology, Peshawar
  http://uspcase.uetpeshawar.edu.pk/icset-2022/
- International Conference on Emerging Technologies In Electronics, Computing And Communication (ICETECC) 2022
  December 7 – 9, 2022, Mehran University of Engineering & Technology, Jamshoro
  https://icetecc.muet.edu.pk/
- International Conference on Computing Research (ICCoR 22)
  December 17th 2022, Capital University of Science and Technology, Islamabad
  https://iccor.cust.edu.pk/
- 1st International Conference on "Innovations in Chemistry, Biochemistry, Biotechnology and Bioinformatics" (ICBBB-2022)
  December 15th 2022, The Islamia University of Bahawalpur
  https://icbbb.iub.edu.pk/

INTERNATIONAL

- 2nd International Conference on Biological Engineering and Medical Science (ICBioMed 2022)
  November 7 – 13, 2022, Stanford University, California
  https://www.icbiomed.org/index.html
- 4th International Conference on Agriculture and Agro-Industry (ICAAI-2022)
  November 10 – 11, 2022, Chiang Rai, Thaiiland
  https://www.ag.ndsu.edu/GIFSIA/events/the-4th-international-conference-on-agriculture-and-agro-industry-icaai-2022
- 11th International Conference on Biomedical Engineering and Biotechnology (ICBEB 2022)
  November 15 – 18, 2022, Shenzhen, China
  http://www.icbeb.org/
- 2nd International Conference on Basic Sciences and Technology (ICBAST)
  November 16 – 19, 2022, Antalya, Turkey
  https://www.2022.icbast.net/
- International Conference on Engineering Technologies
  November 17 – 19, 2022, Konya, Turkey
  https://icente.selcuk.edu.tr/
- 15th International Conference on Machine Vision (ICMV 2022)
  November 18 – 20, 2022, Rome, Italy
  http://icmv.org/
- Future of Digital Tribology
  November 23rd 2022, University of Southampton, UK
  https://iop.eventsair.com/fdt2022
- International Conference on Health and Medicine (ICHM-22)
  November 23rd 2022, The Pan Pacific, Singapore
  https://iser.org.in/conf/venue.php?id=1681894&source=ISER
- 12th International Conference on Computer Science, Engineering and Applications (ICCSEA 2022)
  November 26 – 27, 2022, London, United Kingdom
  https://iccsea2022.org/
- 5th African Conference on Research In Chemistry Education (ACRICE 2022)
  December 7 – 9, 2022, Ain Shams University, Cairo, Egypt
  https://iupac.org/event/acrice-2022/
- 21st IEEE International Conference on Machine Learning and Applications
  December 12 – 14, 2022, Atlantis Hotel, Bahamas
  https://www.icmla-conference.org/icmla22/index.php
- Physics Enhancing Machine Learning in Applied Solid Mechanics
  December 12th 2022, Institute of Physics, London, UK
  https://iop.eventsair.com/asm2022
- 14th International Conference on Computer Science and its Applications
  December 19 – 20, 2022, Vientiane Capital, Lao PDR
  http://csa-conference.org/2022/
- 292nd International Conference on Science, Engineering & Technology (ICSET 2022)
  December 19 – 21, 2022, Toronto, Canada
  https://icset.ciconference.com/
- International Conference on Health and Medicine (ICHM-22)
  December 24th 2022, Mumbai, India
  https://itar.in/conf/index.php?id=1641465&source=ITAR

TECH AND TRADE OFFERS

Ewall

About Ewall

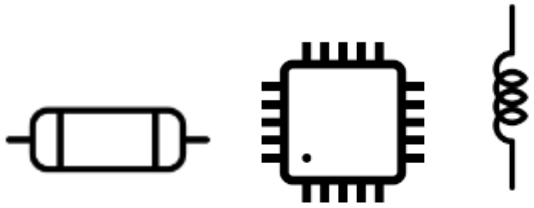
Ewall is an electronics company for Robotics, Electrical and Mechatronic products. The Company products and resources are designed to make the world of electronics more accessible to consumers, inventors, students and hobbyists. We are committed to bring our customers great values in electronic components ranging from a simple chip to a complex circuitry.

Ewall is the first ever Pakistani company that is working on Multi-Rotor UAV's Drone From high range long endurance large size Outdoor Multi-rotors to small size racing indoor multi rotors.

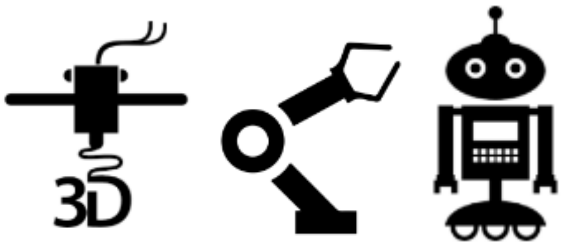
Our Products

- Electronic Products prototyping
- Embedded systems design
- PCB Design/Layout/Manufacture/ fabrication
- Electronic Products Design - from concept to completion
- R&D Based Customized Products
- Laser Cutting & 3D Printing
- Electronic Components
- Re-engineering services
- DIY Parts and Projects
- Electronic Gadget

Transducers, Connectors Diods



Fuses, ICs Inductors



3D Printer, Robotic arm, Humanoid robots

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Rainbow Rubber Industry

About Rainbow Rubber Industry

Rainbow Rubber began to work on the bridges, flyover and overpass components such as Elastomeric Bearing Pads, Expansion Joints System, and Elastomeric Profile Strip etc.

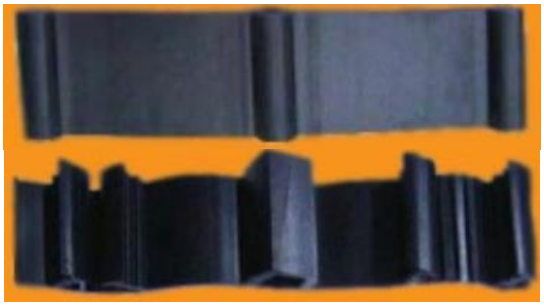
We have a strong growth in the development of the rubber based products. Our experienced and technical Engineers have an excellent influence for the maintaining the quality of the good product.

Our vision is to be the best manufacturer and supplier of Bridge Bearing Pads, Bridge Expansion Joints, and Water Stopper in Pakistan and over the world.

Our Products

- **Water Stopper**

Rainbow offers Elastomeric CR/EPDM water stopper as well as the PVC type. A water stopper is an element of a concrete structure, used to prevent the passages of fluids (water or any other liquid) when embedded in and running continuously through concrete joints.



Pot Bearings for Water Stoppers

➢ **Rubber Safety Products**

Rainbow Rubber offers a very high quality range of rubber products to our prestigious clients. Our Experienced and technical team has taken the responsibility to provide better quality products at reasonable prices. Our safety products are individually tested in PCSIR Laboratory.

Fenders

Rubber Humps

Pot Bearing

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https://www.rainbowrubber.pk/index.html

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