TECHNOLOGY ROUNDUP

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Tech & Trade Offers

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Tech News Headlines

- Statistical Modeling for Stability of Emulsion Liquid Membrane for the Removal of Anionic Dyes from Textile Wastewater
- First Ever Election Prediction Contest in Pakistan Concludes
- Rethinking Ketchup packets: New approach to Slippery Packaging Aims to cut Food Waste
- 3D Printing, the Next Generation of Batteries
- World's most Efficient Semiconductor for Thermal Management
- Researchers 3D Print Prototype for 'Bionic Eye'
- Air Pollution Reduces Global Life Expectancy by more than one Year

Forthcoming Tech Events

- International Academic Conference on Development in Science & Technology
- International Conference On Information Management & Libraries
- World Wind Energy Conference
- CAC Pakistan Summit
- International Conference Energy & Meteorology
- International Conference on Green Computing Technologies, Materials and Devices
- International Conference on Renewable Energy Sources and Sustainability
- International Conference on Engineering & Technology

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Statistical Modeling for Stability of Emulsion Liquid Membrane for the Removal of Anionic Dyes from Textile Wastewater

The importance of statistical modeling is obvious because it imparts an imperative role in predicting the effects of significant factors on any experimental process. In recent days, ELMs (Emulsion Liquid Membranes) are considered as an effective technique for the treatment of industrial wastewater. Despite of many advantages over the other treatment methods, ELM technology encounters one serious drawback of the stability of emulsion. The subject of this research is to identify the factors which are important to study the stability of ELM and also to evaluate the response of these parameters on stability.

The membrane used in this study consisted of Span-80 and Hexane as surfactant and diluent respectively. The internal aqueous phase was H2SO4. The experimental setup was designed by using a well-known statistical approach of DoE (Design of Experiment) and the data was analyzed by Taguchi Method using a fractional factorial design. All the parameters including aqueous phase concentration, surfactant concentration, volume ratio of organic to aqueous phase, emulsification speed and emulsification time were selected as key factors to study their effect on the stability of ELM.

Using different statistical techniques, it was found that emulsification speed and volume ratio of organic to aqueous phase are two most significant parameters. The significance level of these factors i.e. emulsification speed and volume ratio of organic to aqueous phase was statistically found as 99.7 and 99.9% respectively. A statistical model was also developed and the experimental results were compared with estimated results. The value of correlation coefficient, R2 was calculated as 0.997 indicating that the developed model fits the data very well.

Source:

Qurashi, Raja Fahad et al. Statistical Modeling for Stability of Emulsion Liquid Membrane for the Removal of Anionic Dyes from Textile Wastewater Mehran University Research Journal of Engineering and Technology, [S.l.] 2018 37 (3): 631-638

First Ever Election Prediction Contest in Pakistan Concludes

DeepLinks and Red Buffer, with the support of Ignite and in collaboration with Code for Pakistan, organized the first ever nation-wide competition for predicting election results using Artificial Intelligence and Data Science.

Engineers and enthusiasts from all over the country were invited to compete on this challenging problem with the objective or popularizing the use of Artificial Intelligence in the country and creating awareness about its ability to solve real societal problems and avail opportunities. It augurs well that 429 participants registered themselves and competed from across the country, forming 75 teams, half of which were able to complete their initiatives and submit proposals. Marketing and outreach for the event was conducted with the help of the nationwide network of National Incubation Centers, NIC, and finals were held at NIC Islamabad.

Prize money of PKR 100k, 50k, and 25k was up for grabs for the winners (courtesy Red Buffer). IBM was the compute partner, and offered access to IBM's Global Entrepreneurship Program to the winning candidates. Yusuf Hussain, CEO Ignite was the chief guest at the prize distribution ceremony, and Muhammad Awais, a student from ITU Lahore, won the first prize.

Significant amount of data was provided e.g., the 1997 to 2013 elections results, popularity surveys, PLSM data, District wise statistics of healthcare, education, terrorism, banking, trade etc. Contestants were also allowed to use any data they could get their hands on in fact, the winning candidate also used the surveys conducted by different tv channels as well as used Natural Language Processing, NLP to scrape data from the past 20 days (before the election).

It was also observed that survey results provide an accurate predictive factor, especially when the candidate is an incumbent. Another point which emerged is that most models couldn't predict independents very well. The reason was that most models made predictions based on a party's popularity in a particular area that is why they suffered when trying to predict independents. The fact that party affiliation is a key predictor bodes well for the future of parliamentary politics in Pakistan.

Source: **www.https.propakistani.pk**

Rethinking Ketchup packets: New approach to Slippery Packaging Aims to cut Food Waste

New research aims to cut down on waste -- and consumer frustration -- with a novel approach to creating super slippery industrial packaging. The study establishes a method for wicking chemically compatible vegetable oils into the surfaces of common extruded plastics, like those used for ketchup packets and other condiments.

Virginia Tech doctoral student Ranit Mukherjee observes a dollop of ketchup as it moves on a super slippery plastic film. Mukherjee is the lead author on a study that yielded a novel approach to creating super slippery industrial packaging.
Credit: Virginia Tech

The study, which was published in Scientific Reports and has yielded a provisional patent, establishes a method for wicking chemically compatible vegetable oils into the surfaces of common extruded plastics.

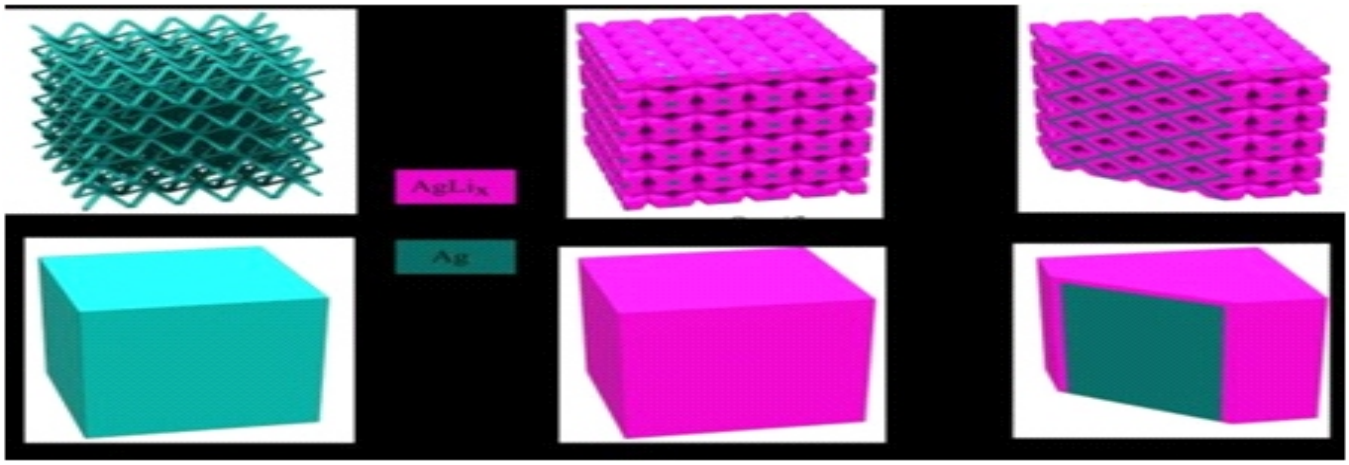
Not only will the technique help sticky foods release from their packaging much more easily, but for the first time, it can also be applied to inexpensive and readily available plastics such as polyethylene and polypropylene.
These hydrocarbon-based polymers make up 55 percent of the total demand for plastics in the world today, meaning potential applications for the research stretch far beyond just ketchup packets. They're also among the easiest plastics to recycle.

This research was funded through an industrial collaboration with Bemis North America. Additional co-authors of the study include Mohammad Habibi, a Virginia Tech mechanical engineering graduate student; Ziad Rashed, an engineering science and mechanics 2018 graduate from Virginia Tech's undergraduate program; and Otacilio Berbert and Xiangke Shi, both of Bemis North America.

Source: www.sciencedaily.com

3D Printing, the Next Generation of Batteries

3D printing can be used to manufacture porous electrodes for lithium-ion batteries -- but because of the nature of the manufacturing process, the design of these 3D printed electrodes is limited to just a few possible architectures. Until now, the internal geometry that produced the best porous electrodes through additive manufacturing was what's known as an interdigitated geometry -- metal prongs interlocked like the fingers of two clasped hands, with the lithium shuttling between the two sides.



Lattice architecture can provide channels for effective transportation of electrolyte inside the volume of material, while for the cube electrode, most of the material will not be exposed to the electrolyte. The cross-section view shows the silver mesh enabling the charge (Li+ ions) transportation to the current collector and how most of the printed material has been utilized.

Credit: Rahul Panat, Carnegie Mellon University College of Engineering

Rahul Panat, an associate professor of mechanical engineering at Carnegie Mellon University, and a team of researchers from Carnegie Mellon in collaboration with Missouri University of Science and Technology have developed a revolutionary new method of 3-D printing battery electrodes that creates a 3-D microlattice structure with controlled porosity. 3-D printing this microlattice structure, the researchers show in a paper published in the journal Additive Manufacturing, vastly improves the capacity and charge-discharge rates for lithium-ion batteries.

This revolutionary method will be very important for consumer electronics, medical devices industry, as well as aerospace applications. This research will integrate well with the biomedical electronic devices, where miniaturized batteries are required. Non-biological electronic micro-devices will also benefit from this work. And on a bigger scale, electronic devices, small drones, and aerospace applications themselves can use this technology as well, due to the low weight and high capacity of the batteries printed using this method.

Source: www.sciencedaily.com

World's most Efficient Semiconductor for Thermal Management

Working to address 'hotspots' in computer chips that degrade their performance, engineers have developed a new semiconductor material, defect-free boron arsenide, that is more effective at drawing and dissipating waste heat than any other known semiconductor or metal materials.

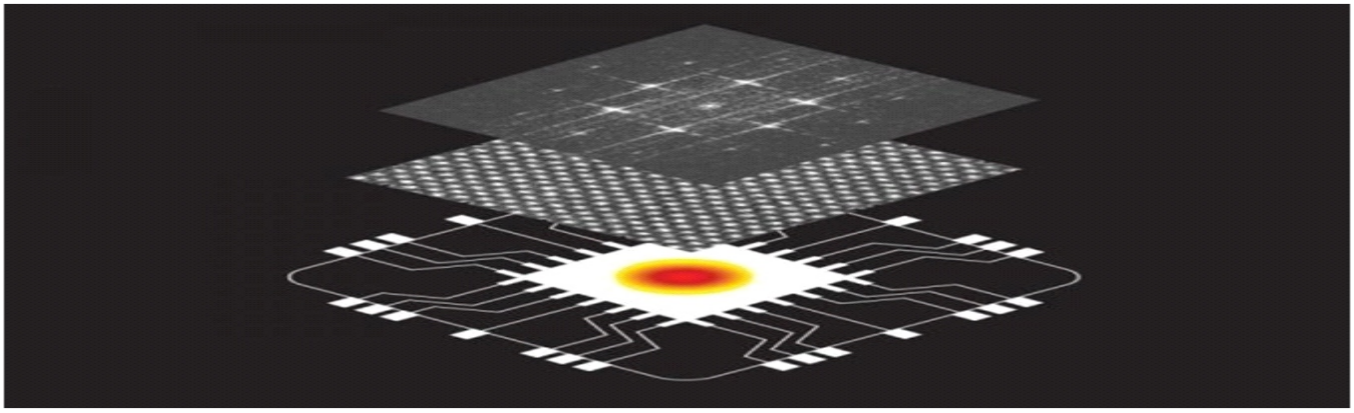


Illustration showing a schematic of a computer chip with a hotspot (bottom); an electron microscope image of defect-free boron arsenide (middle); and an image showing electron diffraction patterns in boron arsenide.

Credit: Hu Research Lab / UCLA Samueli

The study was recently published in Science and was led by Yongjie Hu, UCLA assistant professor of Mechanical and Aerospace engineering. Computer processors have continued to shrink down to nanometer sizes where today there can be billions of transistors are on a single chip. This phenomenon is described under Moore's Law, which predicts that the number of transistors on a chip will double about every two years. Each smaller generation of chips helps make computers faster, more powerful and able to do more work. But doing more work also means they're generating more heat.

"This material could help greatly improve performance and reduce energy demand in all kinds of electronics, from small devices to the most advanced computer data center equipment," Hu said. "It has excellent potential to be integrated into current manufacturing processes because of its semiconductor properties and the demonstrated capability to scale-up this technology. It could replace current state-of-the-art semiconductor materials for computers and revolutionize the electronics industry."

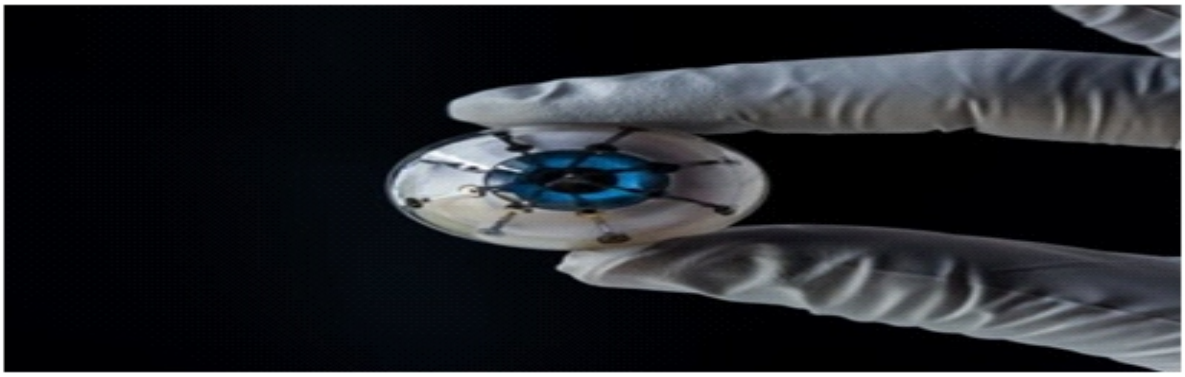
The study's other authors are UCLA graduate students in Hu's research group: Joonsang Kang, Man Li, Huan Wu, and Huuduy Nguyen.

The research was funded by the National Science Foundation, the Air Force Office of Scientific Research, the American Chemical Society's Petroleum Research Fund, UCLA's Sustainable LA Grand Challenge, and the Anthony and Jeanne Pritzker Family Foundation.

Source: www.sciencedaily.com

Researchers 3D Print Prototype for 'Bionic Eye'

A team of researchers at the University of Minnesota has, for the first time, fully 3D printed an array of light receptors on a hemispherical surface. This discovery marks a significant step toward creating a 'bionic eye' that could someday help blind people see or sighted people see better



Researchers at the University of Minnesota have fully 3D printed an image sensing array on a hemisphere, which is a first-of-its-kind prototype for a "bionic eye."

Credit: University of Minnesota, McAlpine Group

The research is published in Advanced Materials, a peer-reviewed scientific journal covering materials science. The author also holds the patent for 3D-printed semiconducting devices. "Bionic eyes are usually thought of as science fiction, but now we are closer than ever using a multimaterial 3D printer," said Michael McAlpine, a co-author of the study and University of Minnesota Benjamin Mayhugh Associate Professor of Mechanical Engineering. Researchers started with a hemispherical glass dome to show how they could overcome the challenge of printing electronics on a curved surface. Using their custom-built 3D printer, they started with a base ink of silver particles. The dispensed ink stayed in place and dried uniformly instead of running down the curved surface. The researchers then used semiconducting polymer materials to print photodiodes, which convert light into electricity. The entire process takes about an hour.

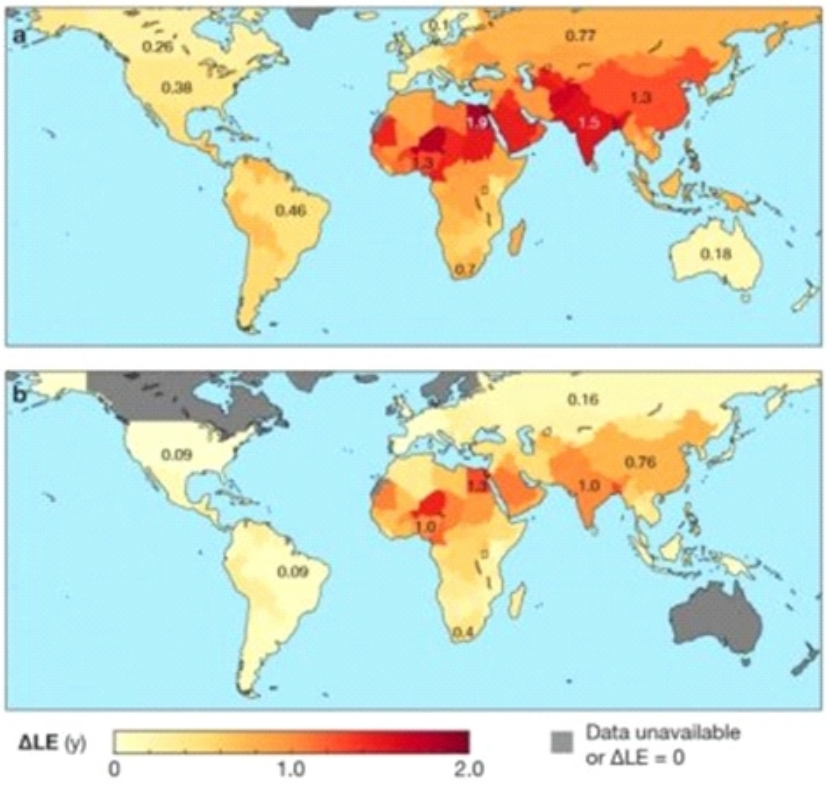
McAlpine said the most surprising part of the process was the 25 percent efficiency in converting the light into electricity they achieved with the fully 3D-printed semiconductors. McAlpine said the most surprising part of the process was the 25 percent efficiency in converting the light into electricity they achieved with the fully 3D-printed semiconductors.

The research was funded by the National Institute of Biomedical Imaging and Bioengineering of the National Institutes of Health (Award No. 1DP2EB020537), The Boeing Company, and the Minnesota Discovery, Research, and InnoVation Economy (MnDRIVE) Initiative through the State of Minnesota.

Source: **www.sciencedaily.com**

Air Pollution Reduces Global Life Expectancy by more than one Year

Air pollution shortens human lives by more than a year, according to a new study from a team of leading environmental engineers and public health researchers. Better air quality could lead to a significant extension of lifespans around the world.



Upper panel a: How air pollution shortens human life expectancy around the world. Lower panel b: Gains in life expectancy that could be reached by meeting World Health Organization guidelines for air quality around the world. Credit: Cockrell School of Engineering, The University of Texas at Austin.

This is the first time that data on air pollution and lifespan has been studied together in order to examine the global variations in how they affect overall life expectancy.

The researchers looked at outdoor air pollution from particulate matter (PM) smaller than 2.5 microns. These fine particles can enter deep into the lungs, and breathing PM2.5 is associated with increased risk of heart attacks, strokes, respiratory diseases and cancer. PM2.5 pollution comes from power plants, cars and trucks, fires, agriculture and industrial emissions.

Led by Joshua Apte in the Cockrell School of Engineering at The University of Texas at Austin, the team used data from the Global Burden of Disease Study to measure PM2.5 air pollution exposure and its consequences in 185 countries. They then quantified the national impact on life expectancy for each individual country as well as on a global scale. The findings were published on Aug. 22, 2018 in Environmental Science & Technology Letters.

Source: www.sciencedaily.com

Forthcoming Tech Events

National

International Academic Conference on Development in Science & Technology
28-29 September, 2018
Rawalpindi, Pakistan
www.academicsworld.org

International Conference On Information Management & Libraries
10-12 October, 2018
University Law College, P.U, Lahore
www.10times.com/information-management-libraries

World Wind Energy Conference
28-30 November, 2018
Karachi, Pakistan
www.wwindea.org

CAC Pakistan Summit
04-05 December, 2018
International Expo Centre, Lahore
www.10times.com/cps-lahore

International Events

International Conference on Energy & Meteorology
16-17 October, 2018
Orlando, USA
www.internationalconferencealerts.com

International Conference on Green Computing Technologies, Materials and Devices
28 November, 2018
Asuncion,Paraguay
www.researchleagues.com

International Conference on Renewable Energy Sources and Sustainability
7th December, 2018
ACCRA, Ghana
Www.iser.org.in

International Conference on Engineering & Technology
18th December, 2018
Dubai,UAE
www.allconferencealert.net

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- Signol Cables
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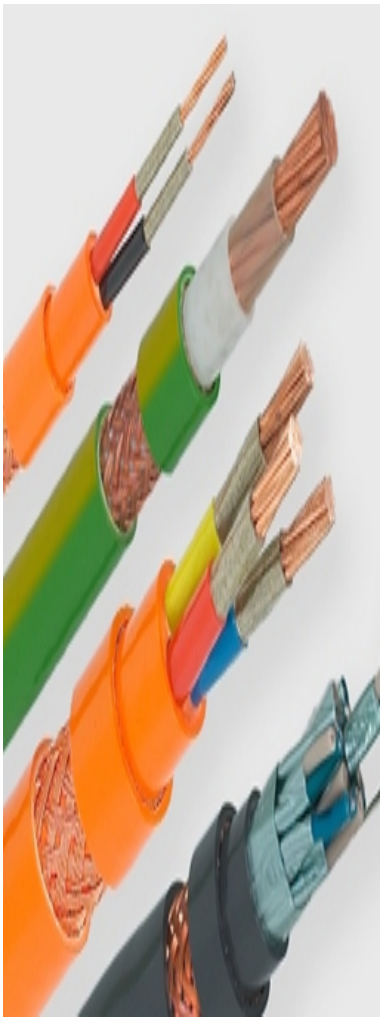
- Stereo Wires
- Ship Cables



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