Researchers from the Council of Scientific and Industrial Research-National Physical Laboratory (CSIR-NPL) have developed an ink that may help in combating the problem of counterfeiting of currency notes, fake printing of passports, and pharmaceuticals. The ink is based on a single excitable dual emissive luminescent pigment. This new security feature of the ink is suitable for printing valuable products for protection against duplicity. The formulation is based on an unexplored combinatorial concept of the fluorescence and phosphorescence phenomenon. Both fluorescence and phosphorescence are spontaneous emissions of electromagnetic radiation. The glow of fluorescence stops right after the source of excitatory radiation is switched off, but in this case, phosphorescence afterglow continues for a duration ranging from a fraction of a second to hours. Normally dual-colour emission needs a dual excitation wavelength but has shown a compound that rarely exists and has not been reported. It has dual features in single excitation. It means it emits intense red colour (611 nm) upon 254 nm excitation source and long persisting green colour (532 nm) when the excitation source is switched off. Normally dual-colour emission needs a dual excitation wavelength but we have shown a compound that rarely exists and has not been reported. The feasibility of the ink for commercial applications has also been tested. The patterns printed with this ink were not only subjected to rigorous ambient conditions which are difficult to store for a longer duration without undergoing any significant change in its properties. The alternate on and off of excitation source, the dual-colour can be easily distinguished by the naked eye under the ambient conditions which are difficult to counterfeit but easy to detect that could be helpful to stop the counterfeiting problem of currency, passport, and many important documents.

For More Details: https://vigyanprasar.gov.in/isw/Scientists-develop-new-ink-formulation-for-security-printing.html

By Dilna S1 CSE

**SMART GADGET**

**Bosch Spxor**

The Spxor uses sensors to detect anything from changes in the temperature to indoor/outdoor air quality and even break-ins. The 4.7-inch high device uses air pressure, noise, and motion sensors to detect an intrusion and alert you about changes in air quality. It can run on battery power for up to three weeks and work with an eSIM card as well as over Wi-Fi.

For More Details: https://www.sciencedaily.com/releases/2021/11/21111154244.htm

By Anjana Jayaraj S1 CE

**MECHANICAL TOOLS IMPROVES OUR LANGUAGE SKILLS**

Our ability to understand the syntax of complex sentences is one of the most difficult language skills to acquire. In 2019, research had revealed a correlation between being particularly proficient in tool use and having the good syntactic ability. A new study, by researchers from Inserm, CNRS, Université Claude Bernard Lyon 1 and Université Lumière Lyon 2 in collaboration with Karolinska Institutet in Sweden, has now shown that both skills rely on the same neurological resources, which are located in the same brain region. Furthermore, motor training using a tool improves our ability to understand the syntax of complex sentences and vice-versa syntactic training improves our proficiency in using tools. These findings could be applied clinically to support the rehabilitation of patients having lost some of their language skills. Language has long been considered a very complex skill, mobilizing specific brain networks. However, in recent years, scientists have revisited this idea. Research suggests that brain areas, which control certain linguistic functions, such as the processing of word meanings, are also involved in controlling fine motor skills. However, brain imaging had not provided evidence of such links between language and the use of tools. Paleoneurobiology has also shown that the brain regions associated with language had increased in our ancestors during periods of a technological boom when the use of tools became more widespread.

For More Details:
https://www.sciencedaily.com/releases/2021/11/21111154244.htm

By Anjana Jayaraj S1 CE

**CARTOON**

**THE SPOOR**

I was trying to teach him to fly.

By Lithiya Fathim S1 ECE

**AMAZING FACTS:**

CAPTCHA is a long acronym. - “Completely Automatic Public Turning Test to Tell Computers and Humans Apart”
Services of major tech companies are currently facing what experts are calling one of the most serious software flaws in recent time vulnerability. The flaw in the Log4j software could allow hackers unfettered access to computer systems and has prompted an urgent warning by the US government’s cybersecurity agency. The new vulnerability affects the widely used library Log4j which was created by Apache, the most widely used web server. The Log4j vulnerability allows remote code execution by simply typing a specific string into a textbox. It was first discovered by Minecraft players but soon it was realized that this vulnerability wasn’t just a Minecraft exploit, but works on every program using the Log4j library. The Log4j exploit is one of the worst vulnerabilities we have had in the last 10 years. Here’s how tech companies are responding to the security flaw that is capable of putting the entire internet at risk. Log4j vulnerability, will not only affect machines that mine cryptocurrencies but can cause more serious problems such as credential and data theft. The tech giant said that its threat intelligence teams have been tracking attempts to exploit the remote code execution (RCE) vulnerability. Google Cloud in its security advisory notes that it is actively following the security vulnerability. They are currently assessing the potential impact of the vulnerability for Google Cloud products and services. This is an ongoing event and we will continue to provide updates through our customer communications channels. The company, like others, has advised all its users who manage environments containing Log4j to update to the latest version. Some customers with overly permissive management gateway firewall rules have had action taken to reduce their exposure from scanning and exploit activity occurring across the Internet. Those affected have seen direct communications from VMware. All environments are different, have different tolerance for risk, and have different security controls and defense-in-depth to mitigate risk, related to Log4j exploit so the decision on how to proceed is up to you. However, given the severity, we strongly recommend that you act, the company recommends all of its users update the patch immediately.


By Jishnu P K S1 CSE

**MAKE ROCKET FUEL FROM CARBON DIOXIDE**

Elon Musk, the Tesla and SpaceX CEO wants to take all the CO2 out of the atmosphere and turn it into rocket fuel, further calling for entries for those who are interested in joining his latest plan. This mission will be important for mars mission as well since musk is also working on taking humans to the red planet in the next few years. It is not known how this mission will be implemented, but this is the first time someone has come up with a concept like this. It may help in the eradication of carbon emissions in the air and fight against global warming and climate change. Solar fuels use the energy of sunlight to convert common substances such as carbon dioxide and water into clean alternative fuels. They have the potential to be an abundant supply of sustainable, portable, and storable energy. Solar fuel production using water and carbon dioxide that has been directly extracted from the air had previously been demonstrated in laboratory experiments or single-step pilot projects. For More Details visit the below link

[https://www.optica.org/home/newsroom/2021/november/making_aircraft_fuel_from_sunnylight_and_water/](https://www.optica.org/home/newsroom/2021/november/making_aircraft_fuel_from_sunnylight_and_water/)

By Mohammed. Alfridi K S1 CSE

**TECH PUZZLE**

DOWN
1. Controlled by voice, they can do many things ask them to such as providing information such as weather and sports scores
2. The use of computer technology to create a simulated environment
3. Machines capable of carrying out a complex series of actions automatically
4. The measurement and statistical analysis of people’s physical and behavioural characteristics
5. Optical head-mounted display displays information in a hands-free

ACROSS
1. Run Apps and play back digital media. Most of them have touchscreens
2. Can carry out household chores or home security
3. Devices that are currently in development and are just starting to make an impact on business and general society
4. By Muhammad Feros Fazaludeen S1 CSE