

# Weekly Discovery

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2 SEPTEMBER 2019 - 6 SEPTEMBER 2019

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5G  
**Waterloo Researchers Develop 200 Times Faster, Low-Cost Network for 5G Connectivity**



"Millimeter wave (mmWave) technology is crucial for 5G networks but the hardware required to use this wave is expensive and needs more power. The new connectivity developed by Waterloo researchers is a network that offers multi-gigahertz of unlicensed bandwidth, more than 200 times that allocated to today's WiFi and cellular networks."

Source: [International Business Times](#) (29 August 2019)

ARCHITECTURE  
**How Gothic Cathedrals Can Inspire Modern Architecture**



"Floors which use an arched design can be thinner, lighter and use fewer materials than conventional slabs which use steel reinforcement. The design could also allow them to be made out of non-traditional materials."

Source: [BBC News](#) (2 September 2019)

BATTERIES  
**Protein Building Blocks Make Sustainable Organic Batteries**



"Researchers at Texas A&M University in the US are working on battery electrodes made from polypeptides – which make up proteins – and say that these materials show promise for sustainable energy storage that is safer for the environment and for users."

Source: [Physics World](#) (30 August 2019)

COMPUTER VISION  
**Research Breakthrough to Safely Monitor Preterm Babies**



"Researchers at the University of South Australia have successfully trialed new computer vision technology to safely monitor the heart and respiratory rates of premature babies in neonatal units."

Source: [Medical Xpress](#) (30 August 2019)

DRONE  
**Bell's New, Self-Flying Cargo Drone Hauls a Heavy Load**



"The four-motor, vertical-lift electric UAV is one of the largest commercial cargo drone projects to reach the skies ... It weighs 300 pounds and can carry an additional 70 pounds of cargo, slung in an aerodynamic pod between its two wings."

Source: [Wired](#) (1 September 2019)

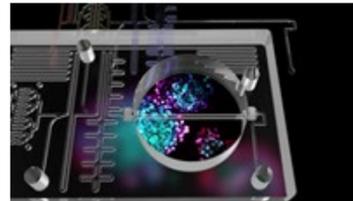
ENERGY  
**Scientific Breakthrough Enables Storage and Release of Mechanical Waves Without Energy Loss**



"The development may have broad implications for efficient harvesting, storing, and control of energy flow for mechanical and optical applications."

Source: [SciTechDaily](#) (31 August 2019)

HEALTHCARE  
**Pancreas on a chip**



"HSCI scientists have combined organ-on-a-chip and stem-cell technologies to make a powerful tool for diabetes research and beta-cell transplantation."

Source: [Harvard](#) (29 August 2019)

INNOVATION  
**Global Innovation Index 2019**



"Switzerland is the most innovative country in the world, according to the latest Global Innovation Index published in July by the UN's World Intellectual Property Organization (WIPO). But for the first time, Israel has also joined the ranks of the top 10 most innovative countries..."

Source: [WIPO](#) (August 2019)

INTELLIGENT MOBILITY  
**Nissan's ProPILOT Golf Ball Turns Every Driver into a Pro**



"...the ProPILOT golf ball supports golfers by following a predefined route to its goal. Nissan's ProPILOT golf ball is the latest in a series of concepts inspired by Nissan Intelligent Mobility technologies. Previous examples include the [Intelligent Parking Chair](#), the [ProPILOT Chair](#) and the ProPILOT Park Ryokan (featuring [self-parking slippers](#))."

Source: [Nissan News](#) (27 August 2019)

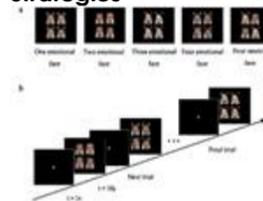
LIVEABLE CITIES  
**10 Technologies for Accessible, Affordable Cities**



"At a time when the future of urbanism is increasingly being defined by new technologies designed to enhance the everyday life of the user, architects and urbanists must remember that a smart city is an accessible city, and also an affordable city."

Source: [Arch Daily](#) (26 August 2019)

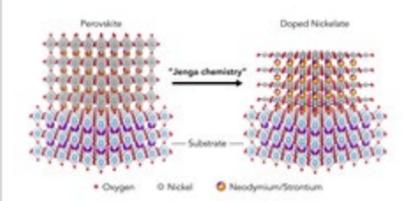
MACHINE LEARNING  
**Depression Recognition Using Machine Learning Methods with Different Feature Generation Strategies**



"Novel method for depression recognition of Electroencephalography is proposed. Propose an ensemble model which consists of deep forest and SVM."

Source: [Artificial Intelligence in Medicine](#) (August 2019)

MAGNETISM  
**First Report of Superconductivity in a Nickel Oxide Material**



"This is a very important discovery that requires us to rethink the details of the electronic structure and possible mechanisms of superconductivity in these materials ... This is going to cause an awful lot of people to jump into investigating this new class of materials, and all sorts of experimental and theoretical work will be done."

Read more at [Nature](#).  
Source: [SLAC National Accelerator Laboratory](#) (28 August 2019)

PHYSICS  
**Chilled Drinks Calculator, the Mathematics of Cooking a Steak, Physics-Related Screensavers**



"Now, two physicists at the University of Warsaw have created a chilled drinks calculator that will tell you how to get your beverage of choice to the perfect temperature using a fridge, freezer, ice bath or even a windowsill ... Now that your drinks are chilling nicely, it is time to fire-up the barbeque and cook a steak or two. Before you pop that expensive cut onto the grill, you might want to consult 'A mathematical model for meat cooking' by Hala Shehadeh of the University of Florida and colleagues."

Source: [Physics World](#) (30 August 2019)

ROBOTICS  
**Getting Robots to Move Like Humans Requires Less Efficiency**



"Fetch Robotics' Russell Toris talks Machine Learning and Vision Algorithms for More Human-like Behavior in Robots at RoboBusiness 2019."

Source: [Robotics Business Review](#) (3 September 2019)

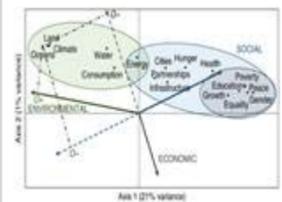
ROBOTICS  
**Robotic Thread Is Designed to Slip Through the Brain's Blood Vessels**



"MIT engineers have developed a robotic thread (in black) that can be steered magnetically and is small enough to work through narrow spaces such as the vasculature of the human brain. The researchers envision the technology may be used in the future to clear blockages in patients with stroke and aneurysms."

Source: [MIT News](#) (28 August 2019)

SUSTAINABILITY  
**Public Views of the Sustainable Development Goals Across Countries**



"The United Nation's 17 Sustainable Development Goals (SDGs) offer an extensive framework for coordinating and shaping government policies, and for engaging the public with sustainability."

Source: [Nature Sustainability](#) (2 September 2019)

