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KNOWLEDGE ABOVE ALL

CYBERTRUCK, A HOPE

BY SHREEYESH S.

The electric pickup truck still seems far away. Last night, Elon Musk took the stage at the Tesla Design Studio in California to finally deliver on a promise he made on Twitter all the way back in 2012 and introduce Tesla's truck. Predictably, the show was elaborate. Unexpectedly, however, the "Cyber Truck" looked considerably different from what anyone was expecting. We also found out that it won't go into production until "late 2021," and that's if things stay on schedule. You can technically pre-order it now, but you'll wait a while before you can drive that "Blade Runner-inspired," (as Musk put it) triangle-shaped truck off into the sunset of the post-apocalyptic wasteland in which it seems Elon expects we'll eventually live.
But what if you just want a regular electric pickup truck? There are some promising options on the cusp, or at least on the horizon, of reality. Here's a quick overview of your options

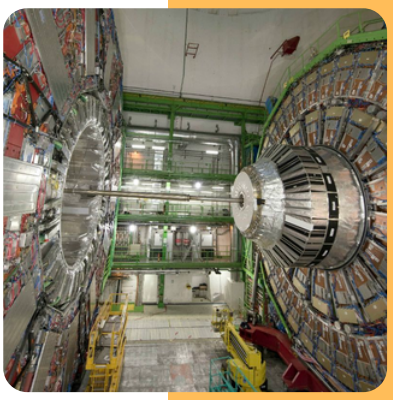
Inside, it has the large touchscreen console that Tesla has been doing for a while, but almost every car manufacturer seems to have embraced for the upcoming model year.
There's an accessory electric ATV you can buy to nestle in the bed. It promises 16 inches of ground clearance. It's a weird vehicle that takes a lot of risks based on the assumption people want something different out of a truck, even though trucks have shown more growth than any other segment in recent years, at least in the United States.

If we're taking Tesla's lofty promises at their word, the Cybertruck will start at just $39,900 when it officially launches. That version will do 0-60 mph in about six seconds, drive 250 miles on a charge, and tow up to 7,500-pounds. As you move up, the 0-60 mph times come down while range and towing capacity go up. The mid-range model will cost $49,900 with a 300 mile range and 10,000 pound towing capacity. The top-end model (which won't show up until the end of 2022 at the earliest) promises 500 miles of range, 14,000 pounds of towing capacity and a 0-60 time of 2.9 seconds. That acceleration performance would put it in supercar territory, but the expected price sits at just $69,900.

4 BIG MACHINES THAT CHANGED THE WORLD

ANURAG PULIKOTIL
STUDENT

1 Built to solve large numerical problems, ENIAC weighed 80 tons and took up 1,800 square feet. Recognized as one of the world's first modern computers—the ancients had their own fascinating computing machines, after all—ENIAC would become the great-great-grandparent of the machines that make modern civilization possible. It was also considered one of the first data centers ever created, another technology that's essential to almost every industry in the world.



2 On September 10, 2008, the largest and most powerful single machine on Earth turned on. Since then, the collider—a 27-kilometre ring of superconducting magnets with subatomic particles smashing together at speeds approaching the speed of light—has made astonishing discoveries, like finding particles, confirming long-predicted ones, and even potentially creating black holes to other dimensions.

3 The first human ever to be slid into a CT scanner was its inventor. In 1971 medical care was revolutionized when biomedical engineer Sir Godfrey Newbold Hounsfield had his own head scanned and digitized into a computerized tomography image. CT scans, the compiling of multiple X-rays from various angles into a three-dimensional image, have allowed physicians to peer inside the human body without cutting open the patient. For his work, Sir Hounsfield won a Nobel Prize in mediciNE.

4 The Bessemer Converter changed everything. The machine blew oxygen through molten pig iron to create steel, and the process dropped its price from $40 per long ton to about $6. The machine also increased the production of steel and required less people to create it. With steel now priced the same as iron, the world's infrastructure changed from the ill-equipped wrought iron origins of the Industrial Revolution, to the better, stronger, and longer-lasting steel of the modern era.

THIS ROBOT CATCHES JELLYFISH WITH A GENTLE 'HUG'

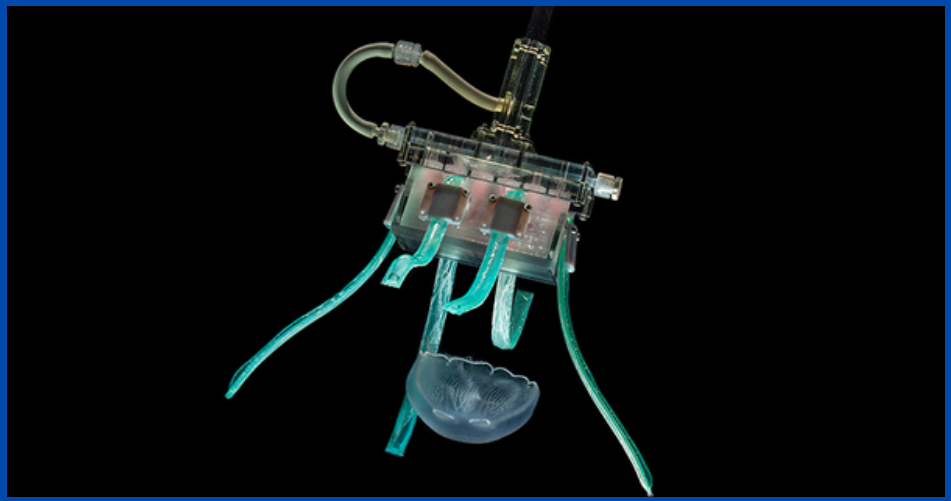
MANDAR PITALE
STUDENT

Jellyfish seem made for their watery world. These gelatinous creatures, with tentacles that dangle from umbrella-shaped bodies, are 95 percent water. But their fragile bodies have made it hard for scientists to safely catch them for study. Until now. A new soft robot that mimics a human hand can gently catch and clasp jellyfish without harm.

"Jellyfish and other gelatinous animals … have a huge amount of potential to teach us things," notes Nina Sinatra. She and her colleagues designed and built their new robot to make it easier to study those jellies. Sinatra is a mechanical engineer. That's someone who uses physics and materials science to design gadgets with moving parts. She worked on the project while at Harvard University in Cambridge, Mass.

"[The fingers] have a gentle grasping force," Stuart says. "It's really the first time that somebody has demonstrated this [approach to handling such soft objects]." The amount of force the fingers exert is less than one newton. Stuart likens that force to the weight of an apple in someone's hand. But to see if the robot can help biologists study jellies in the ocean, the team should test it in the field, she says. That might require attaching the hand to a deep sea submersible. The new robot should survive that. Its materials can withstand the pressure of the deep sea. Sea water won't corrode them either.

This project aims to help scientists safely gather information on soft critters, Sinatra says. Her team is also thinking up ways to modify the hand so that it collects other information below the waves. The robot might someday include sensors, samplers that can grab a bit of DNA or cameras that take photos. Getting data on the creatures' features in the ocean might mean scientists won't even need retrieve the animal to study it.



TINY VEST COULD HELP SICK BABIES BREATHE EASIER

ROHAN THAKUR
STUDENT

Babies that are born sick or prematurely often have lung problems. Many need help just to take a breath. There are machines to help these infants. But using them can come at a cost. "[Their] masks and tubes often leave babies with deformed noses," notes Doug Campbell. And, he adds, "The wires and machinery mean their mothers can't hold or breastfeed them."

Campbell is a pediatrician in charge of an intensive care unit for babies at St. Michael's Hospital in Toronto, Canada. He thought there must be a better way to bring life-saving support to these babies. His team has just begun testing one promising alternative.

Called NeoVest, it looks a bit like a tiny lifejacket. Campbell's team fits the vest around a baby's belly. The vest is airtight, so when it pulls away from the baby, it creates a vacuum. That, in turn, gently pulls on the belly. This motion draws air into the baby's lungs.

The new vest also solves another important problem with traditional forced-breath ventilators, says Michael Dunn. He's a paediatrician at nearby Sunnybrook Health Sciences Center in Toronto. "Pushing gas in is not natural and carries a risk of injury to the lungs," he explains. "Drawing a breath in is more natural," he says. By encouraging the body to draw air in, he says, "NeoVest has great potential as a way of protecting the lung from injury."

Still, there are potential drawbacks, he notes. Babies, especially premature ones, have very sensitive skin. The rhythmic pulling on the skin might injure the skin underneath the vest.

That is one of the things Beck will be watching closely in the St. Michael's tests. She also will be watching to make sure the vests are properly sealed so they do in fact create a vacuum when they pull away from the baby's belly.

"We don't usually think about breathing," says Beck. "It's an automatic process. But what happens when you can't breathe? I want to help the oldest patients down to the tiniest, most vulnerable ones."