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WANT TO TRAVEL TO MARS? HERE'S YOUR (VIRTUAL) CHANCE

By Andrea Rumbaugh

Football fans can strap in and travel to Mars during Houston's pre-Super Bowl festivities.

As part of the Super Bowl Live fan festival, attendees will don virtual reality goggles then actually get on a drop-tower ride. During the gradual ascent, riders will experience a virtual liftoff and journey to Mars, including actual photos from the Red Planet.

Then a 90-foot drop will rush them back to Earth and, visually, the 50-yard line of NRG Stadium. Can't miss the game, after all.

"Only Houston can bring together the celebration of the courage, genius, adventure and heroism of human spaceflight," said Duncan Kennedy, vice president of experience design for Ideas, a digital media and experience design company. "And that's what we're very excited about putting together and sharing with our visitors to Super Bowl Live."

The Future Flight ride and other hands-on space exhibits for Super Bowl Live were announced Wednesday at the George R. Brown Convention Center during the second-annual SpaceCom conference for the commercialization of space.

Future Flight will also provide an opportunity to learn about NASA technologies, such as its rockets and deep-space telescope, and to talk with subject-matter experts about the technology that will enable astronauts to reach Mars. It will also provide STEM — science, technology, engineering and math — activities for younger visitors.

"This feature is really going to highlight NASA's journey to Mars," said Ellen Ochoa, director of the NASA Johnson Space Center.

Future Flight will be open to the public from Jan. 28 through Feb. 5 during the fan festival in and around Discover Green in downtown Houston.

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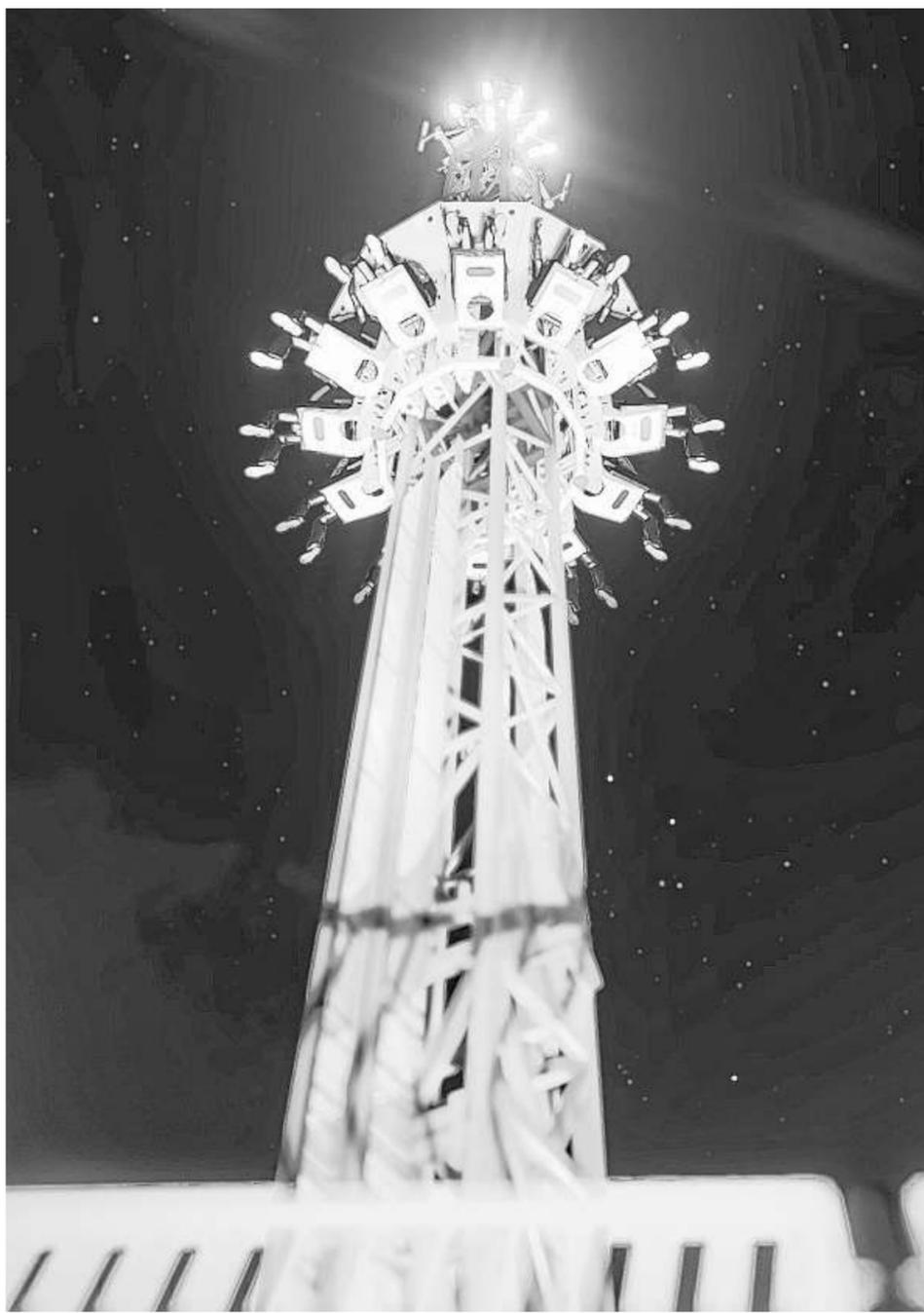


Photo courtesy of the Houston Super Bowl Host Committee.

A rendering of the virtual reality ride that will be at the Super Bowl Live fan festival. Participants wear virtual reality goggles that show a spaceflight while they're on the actual drop-tower ride.

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Could it be that the city has turned a corner on preservation?

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In the latest "Modest Digs" column, we're taking a look at a serene Heights-area refuge.

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Contrary to popular wisdom, more turnout isn't necessarily better for Democrats.



LIFESTYLE WEEKLY

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PLANET TEXAS

A&M scientists unlock mosquito virus secrets

By Kim McGuire

When viruses invade a mosquito's body, there's a battle between the insect's immune system and the infection.

Scientists have long puzzled over what causes the virus to win that tug-of-war, which ultimately makes the mosquito a carrier for diseases like Zika, yellow fever, dengue and West Nile.

A team of scientists from Texas A&M University this week announced they have solved that mystery, publishing new research that shows that several mosquito-borne viruses create a protein that suppresses the insect's immune system.

The research, published in the Proceedings of the National Academy of Sciences, could lead to advances in the fight against Zika, possibly even the development of a vaccine, the scientists say.

"It is definitely something we're looking at," said Kevin Myles, an A&M entomologist and one of authors of the research paper.

Before Myles and his colleagues Zach Adelman and Gladys "Hazitha" Samuel could think about whether humans create an immune system-attacking protein when infected with a mosquito-borne virus, they had to understand the biological changes that occur in mosquitoes when they become infected.

The team's research focused on the virus

that causes yellow fever, though they say the discovery applies to other viruses transmitted by mosquitoes.

In the *Aedes aegypti* mosquito, they found that the yellow fever virus encodes a protein that blocks the insect's immune system. In doing so, the pathogen stays one step ahead of its host, and the mosquito becomes a

carrier.

"While the mosquito doesn't want the virus in its body any more than we want it in ours, and is trying to get rid of it, the virus isn't defenseless," Myles said. "It's fighting back and deploying its own countermeasures. Basically, this is what's known as an evolutionary arms race. The survival of this group of viruses de-

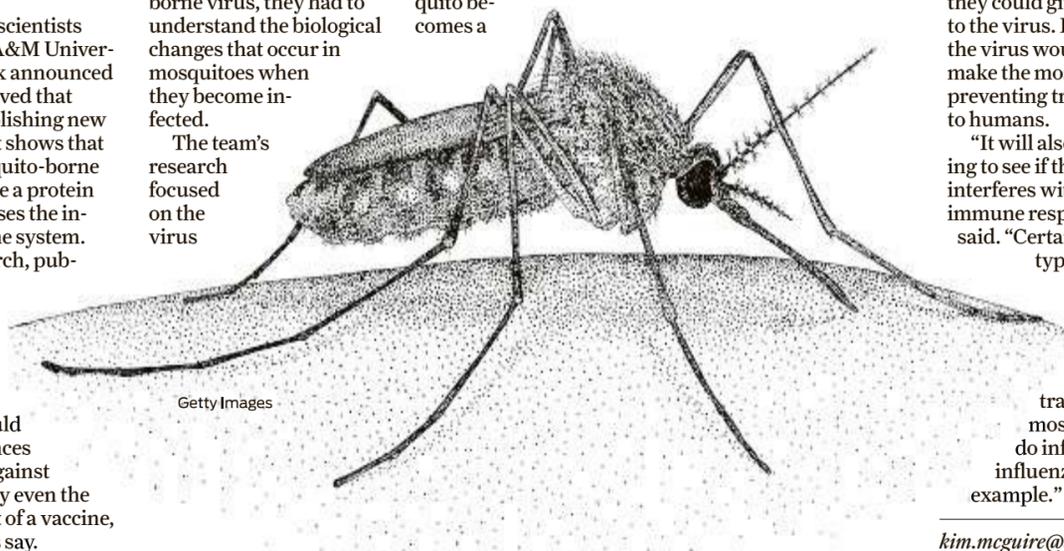
pends on their ability to stay one step ahead of the mosquito's immune response."

Now that the scientists know about the protein, they might be able to trigger a response within the mosquito.

By using gene drive, a method targeting specific genes, they could go in and tip the scale in the mosquito's favor. Or they could give the nod to the virus. In the latter, the virus would actually make the mosquito sick, preventing transmission to humans.

"It will also be interesting to see if this protein interferes with the human immune response," Myles said. "Certainly similar types of proteins have been found in other viruses that are not transmitted by mosquitoes but do infect people, influenza viruses for example."

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Getty Images



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BUSINESS

INSIDE
Shaming drug
company executives
over high prices may
be just a placebo.

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AT A GLANCE

DOW 18,868.14, down 54.92 (-0.3%)
 S&P 500 2,176.94, down 3.45 (-0.2%)
 OIL \$45.57, down 24¢ (-0.52%)
 NATURAL GAS \$2.764, up 5.5¢ (+2.03%)

Houston Chronicle @HoustonChron Houston Chronicle | Thursday, November 17, 2016 | HoustonChronicle.com and Chron.com

Section B ★★

Rate increase requested

Numbers can vary, but average CenterPoint customer could see bill rise by \$2.59 a month by mid-2017

By Ryan Maye Handy

The gas distribution bills for Houston-area residents could rise again next year, if state regulators approve a rate increase sought by CenterPoint Energy.

CenterPoint, a monopoly distribution company, filed its request Wednesday with the Railroad Commission, which regulates gas utilities.

Under the proposal, the bill of an average customer using 3,400 cubic

feet of gas a month would rise by \$2.59 a month by mid-2017. The average increases, however, would vary depending on where customers live, ranging from about \$1.11 a month in coastal cities and other towns east of Houston, to \$6.04 in Conroe.

The increase would be the second in two years for more than 1 million customers. CenterPoint said

the increases will help the company recoup money spent on improving the safety of the gas distribution system, including the improvement and replacement of pipes.

CenterPoint is seeking next year's increase as part of a comprehensive rate-making process it must go through every five years to justify its charges. Once

Cities continues on B9



Houston Chronicle file

CenterPoint said it wants to recoup money spent on improving the safety of the gas distribution system.

SPACECOM

Magnates and Mars



Dave Rossman

NASA's Ken Ruta controls a robonaut during a demonstration at SpaceCom on Wednesday.

By Andrea Rumbaugh

WEALTHY business leaders like Jeff Bezos and Elon Musk are creating buzz around and making progress toward the exploration of deep space, experts said Wednesday during SpaceCom in downtown Houston.

"I think we're entering an era of philanthropic private funding of grand visions in

Wealthy visionaries provide new impetus for such projects as travel to Red Planet and Alpha Centauri fly-bys, panelists say

space that start with our own solar system and eventually lead to humanity going to the stars," said Pete Worden, chairman of the Breakthrough Prize Foundation and former director of NASA Ames Research Center.

Worden and other panelists discussed going to Mars and

beyond during their presentations at the George R. Brown Convention Center. Such exploration, Worden said, will require public-private partnerships between international businesses and governments.

His enthusiasm lies with exploring the nearest star

system, Alpha Centauri. To do this, Worden discussed the Breakthrough Starshot project. This involves small, ultra-light nanocraft — miniature space probes attached to lightweight sails — that will be pushed up to 100 million mph by a ground-based light beam, according to the project's website.

"I'm hoping sometime here later this century, maybe in 2076, hopefully sooner, we will fly by the nearest star,"

Mars continues on B5

ENERGY

Firms pare more workers

By Collin Eaton

Energy companies on Wednesday said they would make additional, albeit modest, job cuts as prices for oil and other petroleum products remain low.

Noble Energy recently cut 60 jobs, mostly in Houston, part of reducing staff levels in its exploration and geoscience operations. Those reductions follow the 410 jobs cut last year.

The job cuts come as the Houston driller shifts resources to its most lucrative offshore exploration efforts and tries to increase the value of its onshore U.S. oil business. The job

Firms continues on B5

ENVIRONMENT

Well capping rules eased

By Ryan Maye Handy

The Railroad Commission of Texas voted this week to significantly relax its requirements for plugging inactive wells, drastically improving the ability of small oil and gas companies to remain in business.

Under the new rule, small companies that rely on low-producing wells will not be forced to plug them until they have hit the bare minimum of oil production — less than a barrel a month. Previously, if production fell below 10 barrels of oil a day, the wells were declared inactive and owners required to plug them, a costly process that many small companies have been unable to afford as prices remain low and effects of the oil bust linger.

As a result, many wells

Rule continues on B5

MONTROSE

Progress touted in parking plan

By Nancy Sarnoff

Residents and visitors for years have complained about parking and mobility in the popular Montrose neighborhood, arguably ground zero for Houston's urban restaurant and bar scene.

Solutions are in the works, the city's chief development officer, Andy Icken, told members of the

Montrose Management District on Wednesday during the group's annual Real Estate Forum.

City and Montrose officials have been discussing the need for better parking management — including the creation of a special parking area — that could result in shared parking garages, sidewalk and signage improvements, and expansion of security sur-

veillance into neighborhoods.

"We've heard over and over again how parking is short in the Montrose area, how, in fact, there is a need for more public parking," Icken said.

The city also has special parking areas in the Texas Medical Center and Greenway Plaza.

Still, the Montrose plan

Street continues on B9



Melissa Phillip / Houston Chronicle file

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BUSINESS

Mars the next logical step, panelist says

Mars from page B1

Worden said.

Other panelists focused on human space flight to Mars. NASA wants to get people to Mars in the 2030s.

"Why send humans to Mars? It is the closest habitable planet," said Brian Duffy, vice president and program manager at Orbital ATK. "And if the human race is ever going to be anywhere else in the universe, then Mars makes the most sense."

Duffy moderated a panel on the making of a Mars mission. Among its experts was Karrie Abelein, a mechanical engineering manager for Lockheed Martin, who highlighted technical challenges of traveling to the Red Planet.

She said temperatures range from minus-225 degrees to 100 degrees, posing a challenge to mechanical and electronic systems as well as astronauts. Gravity there is enough to be annoying but not enough to be useful, so astronaut stability will also be an issue. And the surface of Mars is sharp and has punctured the wheels of earlier rovers.

One of the most significant challenges is mission duration. Mars, at best, is 35 million miles away. Abelein said it will take about three years for astronauts to reach the planet, complete their mission and return. Engineering systems must be able to mitigate failures during a time-frame that long. If a failure does occur, astronauts will need to use 3-D printing to make new parts for repairs.

Tim Kokan, mission architect for advance space launch at Aerojet Rocketdyne, talked about propulsion. He said astronauts and cargo could be sent separately to Mars since time matters more for the humans.

"We want to get the crew to Mars as quickly as we can to limit their exposure to things like microgravity and radiation," Kokan said.

Chemical propulsion or, eventually, nuclear-thermal propulsion could expedite the journey.



Angela Prince from NASA's Neutral Buoyancy Lab talks to fellow NASA employee Jerry Condon near a training capsule at SpaceCom at the George R. Brown Convention Center.

Dave Rossman photos



Dr. Ellen Ochoa, Johnson Space Center chief, talks about the Super Bowl fan festival.



Sallie Sargent reveals that the Super Bowl fan festival will have a Mars ride.



Robin Faideau from the French Office for Science and Technology tries out virtual reality goggles from Aexa at SpaceCom on Wednesday.

The more efficient solar-electric propulsion could be used for cargo.

NASA astronaut Jessica Meir talked about the human element of space travel. One issue she identified will be using the vehicle's limited space wisely. Exercise equipment, for instance, has helped people on the International Space Station maintain muscle mass, but it is pretty large.

She also talked about replicating the space environment here on Earth for training. NASA often uses the Aquarius undersea laboratory, where astronauts are isolated and live in close quar-

ters. They must use complex technologies and may experience communication issues.

Meir did similar training this year in an underground cave network in Sardinia, Italy. She said participants set up camp, conducted a variety of missions and learned to work as a team in a technical environment. If they had put on spacesuits, she said, it would have looked like they were on another planet.

"We really felt like characters in a science-fiction illustration," Meir said.

Mars also snagged headlines in the SpaceCom exhibit hall. The Houston Super Bowl

Host Committee and NASA announced a virtual reality ride that will be part of the Super Bowl Live fan festival.

Riders will don virtual-reality goggles before boarding a drop-tower ride.

During the gradual ascent, they will experience a virtual lift-off and journey to Mars, including actual photos from the Red Planet.

Then a 90-foot drop will rush them back to Earth and, visually, to the 50-yard line of NRG Stadium.

"We've tapped one of our signature industries in Houston to partner with us on this 'wow

factor," said Sallie Sargent, president and CEO of the Houston Super Bowl Host Committee.

Dan Collins, chief operating officer of United Launch Alliance, said space hasn't been this exciting "maybe since the '60s."

Yet he emphasized that Earth isn't disposable. A lot can be learned from deep-space exploration and brought back here.

"I think we can make life on Earth better and better by using the resources and the opportunities that are out there in space," he said.

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Rule raises cleanup worries

Rule from page B1

have been abandoned, leaving the state with the cost of cleaning them up. The new rule could also reduce the commission's considerable backlog of abandoned wells, which owners lacking funds often desert when the state declares them inactive.

This could be a game-changer for small companies, allowing them to stay in business when the old regulations would have forced them out. Oil and gas companies said the commission's decision would provide an economic boost by keeping marginal wells in production as well as relieving companies of the costs of



Eric Gay / Associated Press file

Rules on plugging idle wells have been eased by the Railroad Commission to help struggling firms.

plugging them.

The majority of the public comments received by the commission were supportive of the decision, but a few expressed concerns that the rule would shift the burden of plugging and cleaning up the wells from the industry to landowners who lease mineral rights.

The Texas Land and Mineral Owners Association, which advocates on behalf of property owners, argued in written comments that the rule would encourage sloppy practices "delaying, possibly indefinitely, site cleanup obliga-

tions to the detriment of land and mineral owners in Texas."

The Lone Star Chapter of the Sierra Club echoed the association's criticisms.

"We are concerned that oil and gas operators would use this provision to avoid cleaning up and plugging wells that are no longer productive, and also prevent landowners from moving on from oil and gas activities" wrote Cyrus Reed, the nonprofit's conservation director.

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Firms focus on best fields

Firms from page B1

cuts included support staff, Noble spokeswoman Reba Reid said Wednesday.

Noble said 70 percent of its investments in exploration and production next year will go toward boosting drilling in the DJ Basin in Colorado, the Delaware Basin in West Texas and the Eagle Ford Shale in South Texas. The company estimates its oil and gas production could triple in the Texas fields to as much as 195,000 barrels a day by 2020.

Another quarter of its capital budget is targeted for the Mediterranean Sea, where Noble is drilling off the coast of Israel.

The cuts underscore the industry's increasing focus on its most profitable oil fields as global supplies

remain ample and prices low. The Energy Department reported Wednesday the commercial stockpiles of crude oil rose by 5.3 million barrels last week, the third consecutive weekly increase. Oil prices fell 24 cents in New York to \$45.47 a barrel, less than half the peak price of about \$107 a barrel in June 2014.

The inventories of all petroleum products, including gasoline, rose by 7.1 million barrels. Large supplies of gasoline are keeping pressure on prices and profit margins; in Houston this week, the average gasoline prices fell nearly 4 cents to \$1.96 a gallon, according to GasBuddy.com, a website that tracks gas prices and refining activity.

On Wednesday, BP and Royal Dutch Shell confirmed they're also plan-

ning more job cuts. BP will ax 50 to 80 nonunion jobs at its Whiting Refinery in Indiana, spokesman Michael Abendhoff said.

Shell said it may close its finance operations office in Glasgow, Scotland, consolidating its financial unit into a smaller number of offices. The closure, which would move operations to other offices over 15 months, would mean a "small overall reduction" in staff levels in the financial unit.

"For Shell to remain competitive, difficult choices continue to have to be made to improve efficiency and value for money across all of our businesses and functions," the company said.

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