HOUSTON CHRONICLE

FRIDAY, OCTOBER 30, 2020 • HOUSTONCHRONICLE.COM • VOL. 120, NO. 17 • $2.00 ★★

# Hypersonic A&M

## The Aggies take a lead role in the Pentagon's research and development of ultra-fast travel.

Imagine guiding an object through the air that moves so fast it catches fire, outpaces a speeding bullet and can travel from New York City to Washington, D.C., in less than three minutes.

Sound like Superman? It kind of does, but it's neither fantasy nor science fiction.

On Monday, the Pentagon announced Texas A&M University will lead a nationwide consortium in a five-year, $100 million bid to speed the nation's research into hypersonics, the study of objects that can be steered at speeds greater than Mach-5, or more than 3,705 mph.

It's part of America's scramble to get to and stay at the forefront of research into cutting-edge fields ranging from hypersonics to quantum computing and networking to true 5G wireless technology.

Each of these fields is expected to revolutionize the way most people communicate, travel, bank, use email and the internet, and a host of other aspects of everyday life. Some areas, especially hypersonics and quantum computing, will transform the way nations defend their borders, people and secrets.

That's why we're celebrating the announcement this week that A&M researchers will take a lead role in advancing the study of hypersonics. Anyone who was alive 63 years ago this month when the Soviet Union launched Sputnik 1, the world's first artificial satellite, or learned about it and the American space program later, will understand that this is an old story. And in many ways, of course, a Houston story. It can be both super exciting and frankly terrifying, especially when science advances our capacity to destroy each other.

On the plus side, military funding has long played an essential role in developing scientific breakthroughs that later fuel enormous advances in civilian life. That's still the case in space exploration, where NASA continues to guide ambitious efforts to return people to the moon and onto Mars, even as a private space industry grows frantically in states such as Texas and Florida.

Two years ago, worried about the slow pace of quantum computing research in the United States, Congress passed and President Donald Trump signed the Quantum Computing Research Act of 2018. It added $1.2 billion in spending over five years to boost research and created an office within the White House to help develop a national strategy.

Professor Mitch Thornton of Southern Methodist University in Dallas says quantum computing replaces the computer bit – the binary unit of information that conventional computer chips use to process information as either a 1 or a 0 – with something called qubits. Each qubit can be read as either a 1 or a 0 at the same time enabling huge amounts of data to be represented with only a few qubits.

Thornton said in the two years since the bill passed, IBM and Google have each announced once undreamt-of breakthroughs, and that much of what was only theory a couple of years ago has now been demonstrated in practice. Within 10 years, networked quantum computers will likely be quickly solving problems that conventional supercomputers might take decades to do, from breaking the toughest encryption to predicting financial markets to reducing busy city traffic.

Now it's hypersonics' turn. And A&M is playing a chief role.

"Texas A&M has become the hypersonics research center of the nation," says M. Katherine Banks, A&M vice chancellor and dean of engineering. "Our researchers and partners are unmatched and our new, state-of-the-art facilities will fill critical gaps in U.S. testing capabilities."

The university is home to the George H.W. Bush Combat Development Complex, which has contracted with the U.S. Army Futures Command that opened in Austin two years ago. As part of its role in developing high-tech fighting capabilities, the center has already begun construction on a testing tunnel for lasers and hypersonic flight, two meters in diameter and a kilometer long at A&M's 2,000-acre RELLIS campus in Bryan.

Researchers are racing to develop new ways to fuel the launch of objects that can move thousands of miles an hour, and materials engineers are scrambling to build components that can withstand the fireball-like heat created when objects move that fast. Still other researchers are learning how to navigate an object moving so fast that obstacles appear in their path with extraordinarily short notice.

It's critical work, U.S. Rep. Mac Thornberry, R-Clarendon, the ranking member on the House Armed Services Committee, told the editorial board. "China and perhaps Russia have gotten ahead of us, but we are beginning to narrow the gap," he said. "Hypersonics are going to be key to our nation's security – both offensively and defensively – in the future, so sufficient, stable and predictable funding for research and development are critical."

Rep. Michael McCaul, R-Austin, the ranking member of the House foreign affairs committee, agreed. He's facing Democrat Mike Siegel for re-election. China and Russia, McCaul said, are moving forward quickly.

"(Their) investments in developing hypersonic technology and deployment of new weapons systems directly challenges U.S. early warning, tracking, and identification capabilities and complicates our ability to counter and defeat an attack," he said. "Thankfully, the United States has been investing in developing these emerging technologies, including hypersonics."

While arms races are an inevitable part of national security, we are excited about civil potential for these scientific breakthroughs. That universities in Texas, from SMU in quantum computing to A&M in hypersonics, are playing such large roles is yet one more reason to cheer.