

Tiny robotic helicopter to take off with Mars 2020 rover

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The Mars Helicopter, a small, autonomous spacecraft. Image from NASA, JPL-Caltech

NASA is the U.S. space group. It has spent 50 years exploring Mars, the fourth planet from the sun. NASA has sent orbiters and rovers to explore Earth's neighbor. But the space group's next mission is different. It will be the first to send a tiny robot helicopter to another planet.

NASA made the announcement on May 11. It said the Mars Helicopter will fly inside the Mars 2020 rover when it launches in two years. The helicopter is a small spacecraft. Its spinning rotor is only about 3 feet long. The mission will serve mainly as a test of NASA's technology. The group has never done anything like this before. It wants to find out what is needed to fly a helicopter over a planet that is 140 million miles away.

Thin Atmosphere

It took four years of testing to create the helicopter. That is because operating a spacecraft on the Red Planet is difficult. Mars' atmosphere is very thin. The atmosphere is the layer of gases that

surrounds the planet. On Mars, hovering just 10 feet above the surface is like soaring 100,000 feet above Earth. That's because Earth has a thicker atmosphere than Mars.

The altitude record for helicopters on Earth is 40,000 feet. Above that, the air is too thin to hold helicopters up.

Mimi Aung works at NASA. She is in charge of the Mars Helicopter project. Scientists had to study many things to make sure the helicopter could fly. They had to make the spacecraft "as light as possible" while still being "strong," Aung said.

Solar Cells

The helicopter is equipped with solar cells. They collect energy from the sun and store it in batteries. The helicopter also has a heating device to keep it warm. On Mars, it can get very cold. Temperatures can plummet to minus 100 degrees Fahrenheit.

It takes anywhere from four to almost 30 minutes for light to travel from Mars to Earth. It depends on where the planets are in their orbits. That delay creates some challenges for the operators of the robot on Earth. The operators will send commands to the spacecraft, though. Then it has to carry out those commands to fly on its own.

Important Experiments

The Mars 2020 spacecraft is scheduled to touch down on Mars in February 2021. The rover is about the size of a car. It has a drill for collecting rock samples. It also has a number of other instruments. Some are for doing chemical tests. Others are for testing whether oxygen can be produced from the planet's atmosphere. That experiment will be very important. It will help determine whether humans could survive on Mars.

After landing, the rover will drop off the Mars Helicopter. Then it will back up while the helicopter takes off.

The helicopter's first flight should be a short one. It will climb 10 feet and hover for 30 seconds before returning to the ground. If all goes according to plan, the craft will make four more flights. They will take place over 30 days. Each flight will be longer and more complicated than the last.

Future Helicopters Could Act As Scouts

If the Mars Helicopter fails, it is not a huge problem. The overall Mars 2020 mission will not be harmed. But if it succeeds, NASA will be thrilled. A successful mission could change how the space group explores Mars. Future helicopters could act as scouts. They could explore parts of Mars that rovers cannot reach.