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American Space Agency Launches Black Hole Hunter

CHRISTOPHER CRUISE: This is SCIENCE IN THE NEWS, in VOA Special English. I'm Christopher Cruise.

JUNE SIMMS: And I'm June Simms. Today we tell about American efforts to seek out and study black holes. We also tell about final preparations for setting down a science laboratory on Mars. And we hear from both supporters and opponents of plans to send a human crew to the red planet.

(MUSIC)

CHRISTOPHER CRUISE: America's National Aeronautics and Space Administration launched a telescope into space last month. The telescope is designed to identify and study black holes. NASA officials are calling it, the Nuclear Spectroscopic Telescope Array or NuSTAR.

Scientists believe black holes lie at the center of every huge galaxy, including our own Milky Way galaxy. The gravitational power of black holes is so strong that not even light can escape from them. As gas, dust and stars are pulled into a black hole, the material moves faster and heats up. This action creates very powerful X-ray light emissions. Scientists plan to use NuSTAR to search for these emissions.

Paul Hertz is NASA's director of astrophysics.

PAUL HERTZ: "Stars, nebulae and black holes emit X-rays of the type that we use in medical X-rays, and these cannot be detected from the surface of the Earth. But the NuSTAR telescope will focus these X-rays onto its digital camera and send the pictures back to Earth for scientific analysis."

JUNE SIMMS: About a week after the launch of NuSTAR, its ten-meter-long mast was deployed, separating the mirrors on the telescope from its detectors. That provides the distance required to change the X-ray light into sharp images.

NASA says a main goal of the project is to count the number of collapsed stars and black holes in the universe. The telescope will be able to find black holes hidden behind dust and gas. It also can tell how fast a black hole is spinning. This information will help scientists learn how black holes form. NASA's Paul Hertz

says scientists really are not sure what they will find.

PAUL HERTZ: "Like all of our NASA missions, we're going to find unexpected things out there that will lead us to questions and answers that we aren't even anticipating at this time."

We have placed an image on our website that shows hundreds of black holes. NASA says it is the best image that telescopes being used today can provide. The space agency also has created a simulation that shows how much more NASA expects NuSTAR will see when it searches the sky.

(MUSIC)

CHRISTOPHER CRUISE: The American space agency is making final preparations to set down a laboratory on Mars. NASA launched its Mars Space Laboratory spacecraft from Cape Canaveral Air Force Station in Florida last November. It is set to arrive on the red planet on August sixth.

NASA says its goal is to learn if the landing area has or ever had conditions that might support life. Part of the Mars Space Laboratory is a robotic rover named Curiosity. It is designed to carry out an investigation of Mars' ability to support microbial life.

Two other vehicles – named Spirit and Opportunity – have been exploring Mars since early two thousand four. But Curiosity is about two times as long and five times as heavy as the other rovers. And it has many more scientific instruments than they have. The investigation is expected to last almost two years.

JUNE SIMMS: Last week, the National Air and Space Museum held a "Mars Day" in Washington. The head of NASA's Planetary Science Division, Jim Green, spoke to people about Curiosity and about how difficult it is to land a spacecraft on Mars. He said most of the space agency's missions to Mars have ended in failure. Fourteen projects have been successful, but twenty-six have failed. He told VOA the chance of Curiosity successfully landing on Mars is, in his words, fifty-fifty.

(MUSIC)

CHRISTOPHER CRUISE: Scientists are looking forward to receiving a lot of information from the surface of Mars. But many Americans appear to be more excited about the possibility of sending human beings to the red planet.

The American space agency hopes to put humans on the planet by twenty-thirty. But the estimated cost to do that is increasing at a time when members of Congress are calling for cuts in government spending. And some scientists are

even questioning whether NASA should send humans into space.

JUNE SIMMS: Experiments are continually being carried out on the International Space Station and the Hubble Space Telescope. Such experiments provide dazzling images of deep space. They also add to our knowledge of the universe.

Steven Weinberg, a University of Texas professor, won the Nobel Prize in Physics in nineteen seventy-nine. He says scientists have learned more from technology than humans in space.

STEVEN WEINBERG: "And when you have a facility that involves people, like the International Space Station, which is an order of magnitude more expensive than these unmanned observatories, no important science comes out of it."

Professor Weinberg says robots can do much more on Mars than humans.

STEVEN WEINBERG: "For the trillion dollar cost of sending human beings to Mars, perhaps to just one location on Mars, we could have unmanned rovers wandering all over the planet."

Charles Bolden has been NASA's Administrator since two thousand nine. He told VOA the space agency is combining robotic and human activity on its missions to Mars.

CHARLES BOLDEN: "We are always talking about collaborative efforts between humans and robots. We can't do any...there is no either/or. People like to talk about either/or. And it's not an either/or – it's a together. Collaboration between humans and robots are absolutely essential for any human exploration in the future. You know, if you want to, if you want to know what I think is going to happen – the first humans to land on Mars are going to go right into a habitat that's already there for them and it will have been constructed by a robotic crew that went up and did it."

(MUSIC)

CHRISTOPHER CRUISE: Neil deGrasse Tyson is director of the world-famous Hayden Planetarium in New York City. He agrees with Professor Weinberg that it is more cost-effective to use robots than humans. But he adds it is important to send people into space.

NEIL deGRASSE TYSON: "The issue is what does it mean culturally to send a robot versus send a person? We don't give ticker-tape parades for robots, we don't name schools after robots, we don't build statues to robots."

Mr. Tyson says human beings have a need to explore. And he says many people would sacrifice their lives to do so.

Professor Weinberg understands the appeal of sending a human crew on short space flights. But he says people cannot stay in a hostile place like Mars for a very long time.

STEVEN WEINBERG: "We can't even do that with Antarctica. There is no economically self-sustaining colony on Antarctica and, compared to Mars, Antarctica is heaven."

Professor Weinberg says humans should stop thinking about living on other planets and put more effort into protecting Earth's environment.

(MUSIC)

JUNE SIMMS: It is not just scientists who are criticizing the space agency's plans to send humans to Mars. Some critics are former NASA officials and astronauts. Among them is Chris Kraft, the former head of the Johnson Space Center in Texas.

CHRIS KRAFT: "That objective is ludicrous. It cannot be done. It can't be done technically and, more importantly, it can't be done financially."

NASA Administrator Bolden was asked about Mr. Kraft's comments.

CHARLES BOLDEN: "I can't comment on what he said. We're planning on a mission, you know, a series of missions that take us progressively toward a human mission to Mars in the twenty-thirties."

Mister Kraft supports calls to build bases on the Moon before sending humans to Mars.

CHRIS KRAFT: "We know how to go back to the Moon; it's a reasonable program; it's a feasible program; it can be done with today's capabilities."

In fact, NASA planned to send humans back to the Moon, but many scientists objected to the plan. They said it should be bigger. Two years ago, President Obama cancelled the plan.

CHRISTOPHER CRUISE: David Alexander directs the Space Institute at Rice University in Texas. He blames NASA's problems on politicians who control the agency's budget.

DAVID ALEXANDER: "A lot of people blame NASA for not having a plan or not having this and that, but, actually, they have lots of plans based that they've worked on based on what they have been told to do by Congress and various Congresses over the years."

But NASA Deputy Administrator Lori Garver says many members of Congress support space exploration. She believes that Congress will give the agency the money to send humans to Mars. She says sending humans there has been a goal of NASA for many years.

LORI GARVER: "It's finally getting to the point where we are investing in those capabilities that are going to be able to get us there in a time frame when people are really starting to talk about it realistically."

But David Alexander say before that can happen, NASA officials and America's leaders must answer some important questions.

DAVID ALEXANDER: "The biggest issue though, of course is that a lot of people, a lot of critics are saying is 'Why? Where are we going, why are we going there, and what are we going to do with this big thing that we develop?'"

(MUSIC)

JUNE SIMMS: This SCIENCE IN THE NEWS was written by Christopher Cruise, with reporting by Suzanne Presto and Greg Flakus.

CHRISTOPHER CRUISE: Our producer was June Simms, who was also one of our announcers. I'm Christopher Cruise. Join us again next week for more news about science in Special English on the Voice of America.