



1
00:00:00,390 --> 00:00:00,779

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2
00:00:00,780 --> 00:00:01,780

Music

3
00:00:05,430 --> 00:00:07,036

NARRATOR: In space movies, robots are always nearby to help out when things get dangerous for our

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00:00:10,290 --> 00:00:17,356

heroes. They hold off bad guys to allow an escape, act as a reliable copilot and sometimes just carry data

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00:00:17,770 --> 00:00:19,503

tapes around the universe.

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00:00:19,990 --> 00:00:20,983

NASA's own new Robonaut is not quite as advanced as that, but it's hoped he will add a helping hand for

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00:00:25,930 --> 00:00:29,463

astronauts living at the International Space Station.

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00:00:29,520 --> 00:00:29,596

Meet Robonaut 2, or just R2, an anthropomorphic robot destined to head to the International Space

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00:00:35,910 --> 00:00:40,576

Station with the crew of shuttle Discovery during the STS-133 mission.

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00:00:41,280 --> 00:00:43,810

PHIL STRAUSSER: I've been working on the Robonaut project since about 2002 when I became a, a full-

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00:00:45,350 --> 00:00:52,350

time employee and it was always this sort of distant goal that we're going to have a humanoid robot up in

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00:00:52,530 --> 00:00:52,856

space and now we're going to see it happen.

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00:00:55,070 --> 00:00:55,213

R2 is not quite the completely independent machine shown to movie audiences in the last several decades.

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00:01:01,860 --> 00:01:02,706

But it's the most advanced humanoid robot ever taken into space. Although the robot is definitely

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00:01:07,480 --> 00:01:07,973

experimental, its developers have grand hopes for it, as do the astronauts who would work with it.

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00:01:13,520 --> 00:01:15,310

Jonathan Rodgers: Our ultimate goal is to send the robot EVA. Be able to set up work sites for the

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00:01:18,330 --> 00:01:24,730

astronauts and take care of mundane, boring and dull tasks, that way the crew doesn't have to go

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00:01:24,920 --> 00:01:27,460

through all the trouble to get in their spacesuits and take the risks of going outside.

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00:01:28,180 --> 00:01:30,636

NARRATOR: Before it gets to go outside the station, though, there will be plenty of tests and lots of work

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00:01:32,790 --> 00:01:36,456

inside the station to confirm R2 will work as intended.

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00:01:37,530 --> 00:01:39,733

JONATHAN RODGERS: We'll make sure everything survived launch, just do the basic checkouts, make

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00:01:41,660 --> 00:01:42,683

sure the fingers work, each of the joints in the arms work, cameras, things like that.

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00:01:46,370 --> 00:01:47,026

Working inside the station, R2 is programmed to be a useful member of the crew, and one that doesn't

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00:01:52,380 --> 00:01:54,980

have to sleep, eat food or drink water.

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00:01:54,980 --> 00:01:57,003

JONATHAN RODGERS: We'll move on to a task board that's been developed with buttons and switches

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00:01:59,290 --> 00:02:01,450

and valves that are indicative of what the crew uses on a daily basis. We'd like to prove that the robot can

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00:02:04,330 --> 00:02:04,680

interface with those items as well as the crew can.

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00:02:07,380 --> 00:02:09,076

NARRATOR: That may not sound like much compared to the capabilities of fictional robots, but such steps

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00:02:12,550 --> 00:02:15,016

are a large jump for R2's developers.

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00:02:15,700 --> 00:02:18,043

Ron Diftler: Producing a robot that can work with the same tools and within the same interfaces a human

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00:02:20,290 --> 00:02:21,390

works with requires you to constrain the robot to a human size. Putting all the capability that we want in a

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00:02:26,390 --> 00:02:27,620

human package has been very challenging. The hands specifically, getting all that finger motion and

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00:02:31,760 --> 00:02:36,826

packaging everything in this size of a form is a very significant challenge.

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00:02:37,150 --> 00:02:39,040

NARRATOR: There also were safety considerations since R2 will be working in an enclosed space with six

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00:02:42,060 --> 00:02:43,660

other station residents.

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00:02:44,060 --> 00:02:46,830

JONATHAN RODGERS: The most difficult part about getting Robonaut ready for spaceflight has been our

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00:02:47,890 --> 00:02:55,023

desire to have a robot that's fully functional and very capable, yet balancing that with the safety and the

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00:02:55,060 --> 00:02:59,526

rigors of spaceflight, making durable as well as safe for the crew.

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00:03:00,700 --> 00:03:02,850

NARRATOR: General Motors joined NASA in Robonaut's development in order to improve its own

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00:03:04,550 --> 00:03:09,150

manufacturing techniques and other aspects of automotive development.

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00:03:09,380 --> 00:03:09,823

Adam Sanders: There are a lot of technologies in this robot that will enable us to build safer cars with

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00:03:15,870 --> 00:03:15,973

more advanced features and better options and build them to be more reliable.

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00:03:20,900 --> 00:03:22,183

NARRATOR: For the people behind some of the most famous fictional humanoids, C-3PO and R2-D2 in

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00:03:25,950 --> 00:03:30,883

"Star Wars," the emergence of a real-life ancestor raises other questions.

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00:03:30,940 --> 00:03:32,780

Anthony Daniels: Then we get into the interesting concept of what do people want from a robot? Does it

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00:03:35,900 --> 00:03:37,340

need to be humanoid? Does it need to be the same size, should it be smaller so it doesn't dominate you

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00:03:41,260 --> 00:03:43,886

and threaten you? Should it be bed-height size so it can look after you as you're getting older? Should it

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00:03:45,700 --> 00:03:46,150

have big eyes so you think it's a baby and can relate to it?

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00:03:49,250 --> 00:03:50,176

Gary Kurtz: I love to see robot technology advance like this, this is great.

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00:03:53,390 --> 00:03:54,320

Jeremy Bulloch: This is fantastic. We don't need a robot, you could take me. How about that? I'm probably

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00:03:59,460 --> 00:04:01,726

as bright as him. Well, maybe not.