

Remote V



LG



1
00:00:00,100 --> 00:00:04,480

\h Music

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00:00:04,480 --> 00:00:10,520

\h Life on other planets -- the idea has fascinated man for ages.

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00:00:10,520 --> 00:00:16,850

\h The discovery of Earth-like planets with life-sustaining water and air may come one step closer

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00:00:16,850 --> 00:00:18,970

\h through NASA's Kepler mission.

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00:00:18,970 --> 00:00:23,270

\h When the Kepler spacecraft launches from Cape Canaveral Air Force Station in Florida

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00:00:23,270 --> 00:00:28,860

\h aboard a Delta II rocket, it begins a quest in our part of the Milky Way galaxy.

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00:00:28,860 --> 00:00:35,000

\h The spacecraft will orbit our sun as it focuses on 100,000 stars that may be orbited

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00:00:35,000 --> 00:00:37,930

\h by their own inhabitable planets.

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00:00:37,930 --> 00:00:44,180

\h From NASA's Kennedy Space Center in Florida, join us now as we focus on this exciting mission

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00:00:44,180 --> 00:00:48,780

\h and prepare for liftoff!

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00:00:48,780 --> 00:00:56,680

\h Hi! Thanks for joining us. I'm your host Tiffany Nail. I'm here at Kennedy Space Center Visitor Complex

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00:00:56,680 --> 00:01:02,590

\h This area is known as the Rocket Garden. It's dedicated to the massive giants that have soared into space

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00:01:02,590 --> 00:01:08,560

\h over the years. Here the public can get an up-close look at these incredible rockets.

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00:01:08,560 --> 00:01:14,210

\h This place can be especially inspiring to students. But even if they can't visit,

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00:01:14,210 --> 00:01:20,000

\h students from across the country can learn more about NASA through our Digital Learning Network.

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00:01:20,000 --> 00:01:25,170

\h So we decided to give a group of those students a chance to ask the questions for today's program.

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00:01:25,170 --> 00:01:30,580

\h Here's Damon Talley from the Digital Learning Network to introduce you to the class.

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00:01:30,580 --> 00:01:34,470

\h Thanks Tiffany. Hello, and welcome to the Digital Learning Network.

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00:01:34,470 --> 00:01:39,110

\h We're able to connect with classrooms all across the country, and today we have a special link up with

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00:01:39,110 --> 00:01:43,630

\h Sharon Bains' seventh-grade classroom at Pine Ridge Middle School in Naples, Florida.

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00:01:43,630 --> 00:01:45,280

\h Hello everyone!

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00:01:45,280 --> 00:01:52,050

\h Morning! Good morning Mr. Talley and NASA. We're certainly happy to be with you this morning.

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00:01:52,050 --> 00:01:54,120

\h We have some great questions for you.

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00:01:54,120 --> 00:02:00,500

\h Great! Well, we'll get to those questions in just a few minutes. First, let's learn more about Kepler from

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00:02:00,500 --> 00:02:06,320

\h Kepler Mission Scientist Dr. David Koch, who stopped by the NASA Direct Studio recently.

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00:02:06,320 --> 00:02:12,590

\h The Kepler mission is specifically designed to look for Earth-like planets going around other stars

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00:02:12,590 --> 00:02:18,450

\h stars like our sun. Kepler is designed to find things like Earth.

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00:02:18,450 --> 00:02:22,530

\h That you can't do from the ground you have to go into space.

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00:02:22,530 --> 00:02:31,010

\h The Kepler mission consists of just one instrument. This is not a facility for the general community.

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00:02:31,010 --> 00:02:37,640

\h This is designed to do just one thing and that is to look for planets going around other stars.

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00:02:37,640 --> 00:02:45,230

\h And the way that we do that is with an instrument we call a photometer. It's a general purpose kind of telescope

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00:02:45,230 --> 00:02:52,240

\h but a special kind of telescope it's called a Schmidt design. It has a very large field of view.

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00:02:52,240 --> 00:02:59,000

\h We need to look at a lot of stars. We're going to look at over a 100,000 stars at once with this mission.

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00:02:59,000 --> 00:03:04,940

\h Our telescope field of view is about equal to taking your hand at arm's length, hold it up to the sky

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00:03:04,940 --> 00:03:11,180

\h also equal to about two dips from the big dipper. With that, we can now see lots of stars

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00:03:11,180 --> 00:03:17,070

\h and then we can look for planets around those stars.

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00:03:17,070 --> 00:03:26,940

\h The way Kepler works is it looks for transits that is a planet passing in front of the star and blocking a little

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00:03:26,940 --> 00:03:34,530

\h As we look at that star, we don't see the planet, we just see the starlight dim for a few hours

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00:03:34,530 --> 00:03:42,260

\h as the planet goes in front. One transit, though, isn't enough. What you need is to see a sequence of tra

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00:03:42,260 --> 00:03:50,440

\h The first one and the second one give you a period, but only if you see that third one at exactly the right

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00:03:50,440 --> 00:04:01,980

\h do you know you have a planet orbiting that star. From the period crossing the starlight, crossing the fac

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00:04:01,980 --> 00:04:09,360

\h you can get the distance the planet is from the star using Kepler's third law we named it after Kepler

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00:04:09,360 --> 00:04:14,400

\h the man who invented, who discovered the laws of planetary motion.

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00:04:14,400 --> 00:04:23,000

\h We are going to operate this mission initially for three and a half years that's a baseline mission.

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00:04:23,000 --> 00:04:28,660

\h It's been designed to operate for at least six years. The reason we have to look for three and a half year

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00:04:28,660 --> 00:04:33,560

\h is we're looking for a sequence of transits.

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00:04:33,560 --> 00:04:41,340

\h To get the data down, we have an antenna on the side of the spacecraft that has to get pointed to Earth

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00:04:41,340 --> 00:04:50,380

\h So once a month, we have to point away from looking at our star field and point that antenna so it beam

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00:04:50,380 --> 00:04:55,320

\h down to Earth. So once a month, we'll get that data.

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00:04:55,320 --> 00:05:01,620

\h Boy, what we get out of this mission is going to open our eyes, maybe change the way we think.

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00:05:01,620 --> 00:05:08,570

\h We're going to look at 100,000 stars. We expect to find hundreds of planets. What if we get one?

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00:05:08,570 --> 00:05:17,140

\h What if we get zero? That'll be an eye opener, too. We'd have to think, are we alone? Is life unique?

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00:05:17,140 --> 00:05:24,400

\h Are there no other beings? We won't know that until we get an answer from this, to ask the next question.

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00:05:24,400 --> 00:05:30,410

\h but at least we'll have the answer, are there planets like Earth somewhere out there?

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00:05:30,410 --> 00:05:36,300

\h Thanks Dr. Koch. Before the Kepler spacecraft can start its mission, it has to get into space.

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00:05:36,300 --> 00:05:41,780

\h Let's take some questions now for our NASA Rocket Scientist Armando Piloto, who will also answer the questions.

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00:05:41,780 --> 00:05:46,180

\h NASA Direct Studio. Who has a question?

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00:05:46,180 --> 00:05:54,130

\h Hi. My name is Shelia. Did you always want to be a rocket scientist?

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00:05:54,130 --> 00:06:00,720

\h Hi Shelia! Actually as a kid growing up, I dreamed of launching home runs in a baseball field and

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00:06:00,720 --> 00:06:06,340

\h not necessarily launching rockets. Playing baseball is what I wanted to do.

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00:06:06,340 --> 00:06:12,530

\h But obviously, I have a great job here at NASA. I am very dedicated to what I do.

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00:06:12,530 --> 00:06:19,000

\h And you know, to be able to be part of the Kepler mission and to be able to work with rockets

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00:06:19,000 --> 00:06:26,590

\h is a very rewarding and phenomenal experience. And I'm definitely looking forward to the successful lau

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00:06:26,590 --> 00:06:32,050

\h of Kepler. So to answer your question, no, but I definitely love what I do now.

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00:06:32,050 --> 00:06:36,170

\h Hi. My name is Otto. Where do you sit during the countdown?

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00:06:36,170 --> 00:06:44,710

\h Hey Otto! During launch day, during terminal count, I sit in the Mission Director's Center together with th

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00:06:44,710 --> 00:06:50,230

\h of the NASA management and ULA management team. The Mission Director's Center is actually locate

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00:06:50,230 --> 00:06:57,360

\h at approximately two to three miles away from the launch site. And the MDC, as we call it,

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00:06:57,360 --> 00:07:05,940

\h is equipped with all kinds of data displays, video screens and communication networks to enable the

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00:07:05,940 --> 00:07:13,970

\h management team to determine the health of the spacecraft, the health of the launch vehicle and ensur

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00:07:13,970 --> 00:07:16,630

\h systems are ready to proceed with launch.

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00:07:16,630 --> 00:07:22,360

\h Hi. My name is Lawton. I was just wondering, what kind of fuel does a rocket burn?

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00:07:22,360 --> 00:07:29,040

\h That's a great question. The fuel that we use on the rocket is dependent on what rocket we're using.

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00:07:29,040 --> 00:07:39,150

\h For Kepler, we'll be launching aboard a Delta II vehicle, and the first stage of the Delta II burns a combin

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00:07:39,150 --> 00:07:47,950

\h liquid oxygen and RP1. RP1 is essentially a highly refined kerosene.

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00:07:47,950 --> 00:07:51,820

\h Hi. My name is Andres. How do you know what kind of rocket to use?

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00:07:51,820 --> 00:08:01,090

\h OK. Determining what kind of rocket to use is based on a number of different factors, including cost, sch

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00:08:01,090 --> 00:08:13,420

\h technical requirements and risk. But primarily there are two main factors that we consider the size of the

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00:08:13,420 --> 00:08:18,350

\h and also the orbit where the spacecraft needs to be delivered to.

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00:08:18,350 --> 00:08:23,230

\h Hi. I'm Kelly. What should I study if I want to become a rocket scientist?

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00:08:23,230 --> 00:08:33,920

\h Hi Kelly! I'll tell you what I study. I have a bachelor's degree in mechanical engineering and a master's d

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00:08:33,920 --> 00:08:41,380

\h in engineering management. But my advice to you and to the rest of the kids, that if you want to work wi

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00:08:41,380 --> 00:08:48,310

\h is to first of all, do good at math and science so that you can develop strong analytical skills.

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00:08:48,310 --> 00:08:57,970

\h I would also encourage you to take classes in speech and debate so that you can also develop strong

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00:08:57,970 --> 00:09:06,690

\h communication skills. I think it's also very important that you get involved with team projects and team s

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00:09:06,690 --> 00:09:15,880

\h so that you can learn to interact in a team environment. And then once in college, I think it's important to

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00:09:15,880 --> 00:09:27,220

\h in either physics, science, engineering or math. I think the combination of strong analytical and commun

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00:09:27,220 --> 00:09:36,170

\h combined with one of those degrees will open a lot of opportunities for you, including opportunities to work

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00:09:36,170 --> 00:09:40,290

\h at the Kennedy Space Center working with rockets.

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00:09:40,290 --> 00:09:46,560

\h Well that's all we have time for. Thanks Ms. Bains and your students for all of your help today.

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00:09:46,560 --> 00:09:50,470

\h Goodbye.

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00:09:50,470 --> 00:09:53,230

\h Now back to your host, Tiffany Nail.

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00:09:53,230 --> 00:09:59,120

\h Thanks Damon, and thanks to all our guests for helping us learn more about this exciting mission of Kepler.