





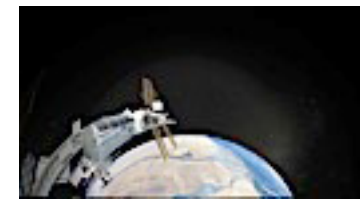



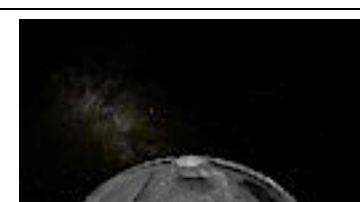

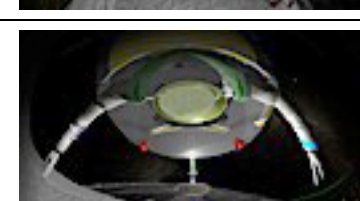




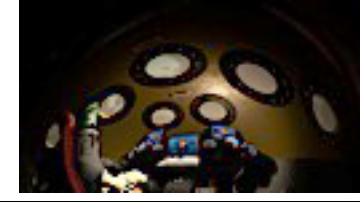




THE GREAT PLANET ADVENTURES








VERSION (SUBTITLES)



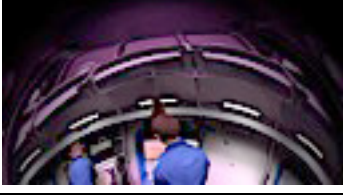



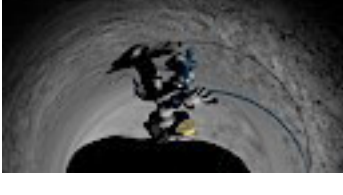
REVISED: FEB 16, 2015








SCENE	TIME	SCRIPT
PART 1		INTRO
	00:03	A variety of planets, planetoids and moons orbit our sun. What if we had a space ship fast enough to visit each one? Where would we land? What kind of colony would we build? We have selected real destinations with different terrains, temperatures, energy sources, and gravity pulls. On these worlds we have created realistic environments, found reasons to be there, and discovered ways to have fun.
	00:31	Earth has the strongest gravity pull of any surface in the solar system. When we leave Earth, even to visit the International Space Station, we leave much of this gravity burden behind. Each low-gravity outpost offers experiences beyond any thrill on Earth. Our destinations are real places on real worlds that deliver the greatest of planet adventures.
TITLES		OPENING TITLES
	00:54	The Great Planet Adventures
PART 2		ASTRONAUT
	01:06	I'm Don Pettit. I'm one of the lucky ones who get to fly into space. I work for NASA. I've flown to the International Space Station 3 times and cumulatively have over a year living off the planet.
	01:23	The views change between day and night and they are both spectacular. The nighttime views though are special because you get to see the planet on the length scale of half a continent.
	01:39	Viewing Earth's atmosphere on edge is incredibly spectacular. The whole biosphere of Earth hinges on having our atmosphere. Without an atmosphere a planet's surface is a tortured piece of rock.

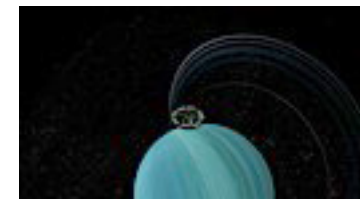






	02:04	Space colonies are inevitable. The reason for that is because we explore. This exploration ultimately allows for the survivability of human beings as a species. It will happen and that's going to be one of the ultimate reasons for exploring space.
	02:25	The International Space Station has taught us how to build a human habitat in space. Once we have the rockets and fuel to carry our outpost to other worlds, we will leave the Earth behind. Let's go forward to a time when we can be free of Earth's gravity and explore our solar system. We will begin with Mercury, the planet closest to the sun.
PART 3		Rebound Peak, Tolkien Crater, Mercury
	02:54	The Sun powers the solar system. From active regions around sunspots, charged particles stream outward in coronal mass ejections. The sunlit surface of nearby Mercury is four times hotter than boiling water.
	03:13	Welcome to Tolkien Crater near the North Pole of Mercury. We hide from the blazing sun by living inside the crater. As Mercury turns, the sun never rises above these crater walls. Its heat cannot vaporize the ice left here by impacts with comets over billions of years. This ice makes life possible so close to the Sun.
	03:34	At the center of Tolkien Crater, there are two rebound peaks. Sharp shadow lines mark daylight and darkness on our airless world. Without air to scatter sunlight, our shadows are completely black. On top of this rebound peak, we've built a solar energy farm to power our colony and a solar observatory for monitoring active regions on the sun.
	04:00	In a gravity field less than half of Earth's, we use zip lines to move from place to place and even down to the ice mining stations on the crater floor. Supplies and ice travel along these zip lines in closed containers. We strap our space suits under zip boards and ride behind the cargo. Zip boards shield us from solar radiation as we move into sunlight, whenever the sun peeks above the crater rim.
	04:41	Looking down, we can see our habitat and greenhouses. These zip lines connect our habitat to our solar energy farm above and to the ice miners far below. Zip-lining in Tolkien Crater is our favorite low-gravity off-world thrill.
PART 4		Troposphere above Ma'at Mons, Venus





	05:06	Venus has a gravity pull almost as strong as Earth's, but holds onto a very different atmosphere, creating very different surface conditions. Its thick cloud cover absorbs heat, raising the surface temperature past the melting point of lead. The atmospheric pressure reaches ninety times that of Earth, more like the pressure of the ocean at a kilometer below the surface.
	05:32	On Venus, we live in a giant ocean liner, floating like a dirigible in the planet's atmosphere. The gases that sustain life are lighter than those in the lower atmosphere. For this reason, our ship can ride far above the planet's scorched surface. The gravity tug in our habitat is almost as strong as Earth's. A tall center shaft carries experiments and sensors toward the planet's surface.
	06:02	Like Earth scientists exploring the ocean floor, we use a high-pressure submersible to visit the surface of Venus. The valleys and volcanoes here look strangely familiar, but heat and pressure make this a very alien and dangerous world.
	06:26	Once we dip below the thick cloud layers, we can see the erupting volcano Ma'at Mons. It reminds us of a seamount on Earth, except in this off-world adventure we have substituted a cold ocean floor for a raging inferno.
PART 5		Shackleton Crater, Lunar South Pole
	06:56	Earth's moon is one of the largest in the solar system. Unlike Earth, the moon does not have enough surface gravity to hold onto an atmosphere or ocean. Without air or water, there's no weather, no weathering, and no sound.
	07:12	Because of the low lunar gravity, an Apollo astronaut could collect moon rocks while carrying a life support backpack weighing more than he did. His lunar rover could bounce along at golf-cart speeds, kicking up loose dust and leaving tracks that will last a million years.
	07:37	Tomorrow's moon base lies on the rim of Shackleton Crater, near the Moon's South Pole. Space probes have detected ice deep inside this crater, where the sun never shines.

	07:53	Welcome to the perpetual twilight of Shackleton crater. The sun peeks above the crater rim and circles the horizon each month. Here at the South Pole, sunlight reaches our solar collectors over 90% of the time.
	08:09	Our monster truck is much more like a modern Earth truck than the Apollo rover. The steep torturous terrain of Shackleton Crater requires a much tougher vehicle. Those crater walls drop over 4 kilometers to the cold crater floor.
	08:29	Eighty people live in our lunar colony, built with tubes and inflatable rings transported from Earth. We are independent and self-sufficient now, but trade our resources with Earth for manufactured goods.
	08:47	Robotic ice miners like this descend all the way to the crater floor. We melt the ice they collect for water to drink and separate it into oxygen and hydrogen for rocket fuel.
	09:01	Our greatest gravity thrill is driving a monster truck along these steep crater walls -- slipping and sliding in the lunar dust, while trying not to tumble into the crater. No steep mountain road on Earth can compare with this breathtaking low-g experience.
PART 6		North Rim of Ophir Chasma, Mars
	09:35	The red planet Mars is a cold desert with volcanic mountains and deep canyons. The planet's gravity pull is less than half of Earth's and cannot hold onto an atmosphere thick enough to support water. The temperature is almost always well below zero.
	09:55	Our habitat has living quarters, plus a greenhouse for our fresh food and a command center where we work.

	10:03	Our outpost lies near Ophir Chasma, on the north rim of the Valles Marineris, the largest canyon in the solar system. Today we will rappel into this great canyon.
	10:15	Although we're near the equator of Mars, it's always cold compared with Earth. So we travel to the canyon rim in a warm pressurized rover. The sky is beautiful here, but we can't breathe the planet's thin carbon dioxide atmosphere.
	10:34	Scientists back at our outpost, monitor our video and the conditions inside our pressurized rover.
	10:41	It's possible that water once flowed in the Valles Marineris, much like the Colorado River flows through the Grand Canyon on Earth today. Rappelling into Earth's Grand Canyon cannot compare to this off-world adventure, where we weigh much less and our canyon is over 4 times deeper.
PART 7		Casanova Crater, 433 Eros
	11:27	The orbit of asteroid 433 Eros brings this world close to Earth and could someday put it on a collision course with our home world. But for today, this dangerous asteroid stays a safe distance away. Its gravity pull is almost zero. In sunlight, the temperature here can reach the boiling point of water.
	11:51	Because we're in orbit, falling around Eros, we're weightless. From Eros, we can extract iron, nickel, and titanium for construction, water and oxygen for our survival, and hydrogen and oxygen to use as rocket fuel. Once we're loaded, we transport the volatiles and minerals we mine to Earth orbit or to the moon for construction projects and rocket fuel.
	12:30	There's almost no gravity pull on this tiny asteroid. Our challenge is crawling or should I say clawing, grasping, and clinging to this giant rock. With just a jump or a push, we can launch ourselves off this flying mountain. That's why we wear a tether, like a bungee jumper, so we can't get far without being pulled back to Eros. When the day's mining is done, this is our favorite low gravity thrill – to jump off an asteroid and then fall back.
PART 8		Tyre Impact Basin, Europa, moon of Jupiter

	13:13	The gas giant Jupiter has thin rings and a gravity field over twice as strong as Earth's. But Jupiter has no surface where astronauts could stand and feel this force. Its red spot is really an enormous storm that would swallow the Earth. Europa is one of Jupiter's four large moons. It's smooth and ice-covered, with an ocean far below its icy crust.
	13:42	Welcome to Clark Colony. Our habitat is a maze of igloos in the low-lying Tyre Impact Basin – on the side of Europa facing away from Jupiter's deadly radiation. Here we're drilling through kilometers of ice to reach Europa's subsurface ocean. We hope to collect a water sample that we can test for the presence of alien life.
	14:10	For us, exploring means spelunking in these spectacular ice caves, carved by fracture lines in Europa's crust. Ice tunnels in Earth's Arctic cannot compare to the glistening beauty of these majestic caverns of ice.
PART 9		Lake Ligeia, Titan, moon of Saturn
	14:28	Countless tiny particles in a thin disk create the spectacular rings of Saturn. These particles are almost entirely water ice with trace amounts of dust. They orbit so close to Saturn that the planet's gravity prevents them from coalescing into a moon. The temperature here is always colder than 150 degrees below zero.
	14:52	Titan, Saturn's largest moon, is the only world besides Earth with a nitrogen atmosphere, but its surface gravity is less 15% of Earth's. Like Earth Titan has oceans, but they're made of liquefied natural gas instead of water.
	15:11	On Titan, the chemistry and temperature are very different from Earth. But the terrain surrounding our base on Lake Ligeia, reminds us of coastlines back on Earth. This lake of liquid methane is larger than Lake Superior and lies near Titan's north pole. The low gravity and thick atmosphere make Titan a glider's dream.
PART 10		Verona Rupes, Miranda and the Upper Atmosphere of Uranus
	15:38	The gas giant Uranus also has rings, but they are much thinner than Saturn's. The planet's extreme tilt puts one pole in sunlight and the other in darkness for half of the long Uranus year. The gravity pull here is 90% of Earth's, but the temperature hovers at 200 degrees below zero.

	16:01	Energy is critical for us to survive this far from the Sun. We depend on a ram-scoop to collect Helium 3 in Uranus's upper atmosphere. Helium 3 is the ideal fuel for our nuclear fusion reactors. Using thrusters mounted around the ship, we continually alter the orbit of our ram-scoop to collect more gas and to push upward against the planet's gravity pull.
	16:37	In our small space planes, we've invented a sport we call skimming. The planet's atmosphere is perfect for our aerial acrobatics. Transports dock at the ram-scoop and then carry the Helium 3 we collect to our outpost on Miranda, closest of the major moons of Uranus
	17:15	Our habitat lies at the base of Verona Rupes, the highest cliff in the solar system. On this low-gravity moon, cliff diving is fantastic. The drop is long and incredibly slow. Without any wind, we can count on a perfect vertical fall along the cliff face every time. This is the ultimate low-g off-world thrill!
PART 11		Mahilani Plume, Triton, moon of Neptune
	18:07	Neptune, fourth of the gas giants, has storms in its banded atmosphere and thin rings around its equator. Triton is the largest of Neptune's many moons. Its erupting geysers make it one of the few volcanically active worlds in the solar system.
	18:32	Our Geysers Observatory lies near the Mahilani Plume in Triton's southern region of perpetual twilight. These geysers contain nitrogen gas, water ice and other compounds needed for life.
	18:49	Jet packing around and through one of Triton's geysers is fantastic. Unlike much of the solar system, Triton is always changing as geysers create new features for us to explore. Jet-packing on a low-gravity moon around the solar system's last planet is about as exciting and off-world as you can get.
PART 12		Snow Fall on Pluto
	19:13	The dwarf planet Pluto lies beyond Neptune. Here the surface gravity is about 5% of Earth's and the temperature is below minus 220 degrees. Pluto is so far from the sun that it requires over 248 Earth years to make one Pluto year. Its surface is a dirty yellow with bright polar caps, along with bright and dark spots. Surface frosts cause these different pastel hues.

	19:44	Welcome to Pluto. You've arrived on Pluto just in time to watch the atmosphere snow out as Pluto moves farther from the sun. With all of this snow, we've created a winter sports paradise. Snowmobilers can get some serious air off these jumps in Pluto's low gravity!
	20:11	Whether your sport is snowmobiling or rocket powered skiing, the long jumps and gentle glides back to the ground are incredible. The key is firing your jetpack at the right time and we've had lots of practice. Out here we like the cold, and enjoy the most extreme of all winter sports!
	20:44	Our great planet adventures make the extreme sports of Earth seem tame. Only time will tell if we find the energy resources to travel to the planets. But whenever and wherever we go, we'll recreate familiar challenges, taking advantage of our strong muscles and bones.
	21:08	Although the timeline is unknown, we can still imagine what we will do on each world. We know that when we leave Earth, our love of pushing our limits, setting new records, and facing incredible challenges will go with us. Someday, somehow, adventures like these will make us a spacefaring species.
CREDITS		ENDING CREDITS
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Astronaut Voices		Don Pettit, Earth Orbit Ken Hayes, Mercury and Titan Catherine Lu, Venus and Uranus Shai Fishman, Moon and Triton Cecilia Ottenweller, Mars and Pluto Stephen Reagen, 433 Eros Derien Mattingly, Europa
Narrator		Jim Bratton
Script and Direction		Carolyn Sumners
Score and Audio Post-Production		Fish-I Studios Shai Fishman
Video Production		HOUSTON MUSEUM OF NATURAL SCIENCE Adam Barnes Tony Butterfield HOME RUN PICTURES Tom Casey Warren Casey Gerry Crouse Glen Johnson Phillipe Velasquez

		<p>Rachel Wagner</p> <p>TIETRONIX SOFTWARE, INC. Frank Hughes Marco Zambetti Jeff Rosenthal Victoria Rosenthal</p> <p>LOUISIANA ART AND SCIENCE MUSEUM Kyra Elliot</p> <p>WORLD WIDE TELESCOPE Jonathan Fay</p> <p>RICE UNIVERSITY Fisheye lens on ISS</p>
Photography		Don Pettit
Content Review Committee		Patricia Reiff, Ph.D., Chair Jon W. Elvert Frank Hughes Randy Gladstone, Ph.D. Stuart Robbing, Ph.D. Linda Spilker, Ph.D. Clare Parker James Talmage Jerry Vera James Wooten
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