

For more about Dr. Porco, see:  
[Carolyn Porco On Science and Religion](#)

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Scientist at Work: Carolyn Porco

### An Odyssey From the Bronx to Saturn's Rings

By DENNIS OVERBYE

It is twilight time on Saturn.

Shadows lengthened to stretch thousands of miles across the planet's famous rings this summer as they slowly tilted edge-on to the Sun, which they do every 15 years, casting into sharp relief every bump and wiggle and warp in the buttery and wafer-thin bands that are the solar system's most popular scenic attraction.

From her metaphorical perch on the bridge of the Cassini spacecraft, which has been orbiting Saturn for five years, Carolyn Porco, who heads the camera team, is ecstatic about the view. "It's another one of those things that make you pinch yourself and say, 'Boy am I lucky to be around now,' " Dr. Porco said. "For the first time in 400 years, we're seeing Saturn's rings in three dimensions."

On Monday, Dr. Porco and the Cassini team released a grand view of the rings in all their shadowed glory, including clumps, spikes, undulations and waves two and a half miles high on the edge of one ring.

"We always knew it would be good; instead, it's been extraordinary," Dr. Porco said of the cascade of results that have placed her in a spotlight to which she has become increasingly accustomed. "I feel I'm on a great human adventure," she said.

The work may be carried out by robots, Dr. Porco said, "but we are all explorers."

"It's thrilling," she added, "and I want everyone to know how thrilling it is."

Dr. Porco, 56, a senior researcher at the Space Science Institute in Boulder, Colo., may be the leader of the camera team on the \$3.4 billion Cassini mission, an adjunct professor at the University of Colorado and one of Wired magazine's 15 people who should be advising the president. But she is also a proud child of the 1960s who has never let go of the exuberance of that era when President John F. Kennedy "said that the sky isn't even the limit," as she puts it, and "things were unleashed."

Her entries on the Cassini imaging Web site echo the spirit of the character Capt. James T. Kirk on "Star Trek":

Captain's Log

March 23, 2009

We are almost there. Saturn and we, its companions, have journeyed together now for nearly five years, in a circumnavigation of the outer solar system.

Stanley Kubrick's film "2001: A Space Odyssey" is still her favorite movie, and she still loves the Beatles. On a visit to England in 2001, she and her imaging colleagues recreated the album cover picture of the Beatles crossing Abbey Road, with Dr. Porco leading, dressed in white like John Lennon.

Dr. Porco was born and raised in a Bronx family with four brothers she partly credits for her subsequent success in astronomy. "I'm used to fighting and arguing with males," she said.

Her father, an Italian immigrant, drove a bread truck, and her mother kept house. Dr. Porco attended Cardinal Spellman High School, the same school that Justice Sonia Sotomayor of the Supreme Court attended.

She was a studious child and a spiritual seeker — "13 going on 80" — who lived a lot in her head. Later, as a student at the State University of New York at Stony Brook, she said she spent two years as a chanting Buddhist and even went on a two-week pilgrimage to Japan, where she was the majorette in a Buddhist marching band, wearing hot pants. "Now, THOSE were the days," she wrote in an e-mail message.

By then, Dr. Porco was pursuing the future she had glimpsed at age 13 when she saw Saturn through a neighbor's rooftop telescope. As a graduate student at the California Institute of Technology, she floundered at first but then got a job helping to analyze data from the two Voyager spacecrafts, which toured the outer planets from Jupiter to Neptune from 1978 to 1989.

It was there, said Peter Goldreich, her thesis advisor, that she demonstrated a knack for picking out important things. Among them was a discovery that mysterious dark spokes in Saturn's ring system were connected to the planet's magnetic field. She did her thesis on aspects of the rings and how they were shaped by the gravity of tiny moonlets.

Dr. Porco also did a lot of dancing, and played a guitar and sang in the Titan Equatorial Band, a pickup group of scientists and science writers named after a feature on Saturn's largest moon, and later for a group in Tucson called the Estrogens. "Three women and one very brave guy," she said.

By the time Voyager passed Neptune in 1989, Dr. Porco was a research associate at the University of Arizona and leading a small team trying to make sense of the thin rings around Neptune.

"She was one of the young rock stars of Voyager," said David Grinspoon, of the Southwest Research Institute in Boulder, who was a graduate student at Arizona at the time.

But it had not been an easy climb in the overwhelmingly male and competitive environment of space science. Dr. Porco once described scientists as "schoolyard toughs." She recalled pumping herself up to be an "alpha male" before meetings of her ring team.

Even as a graduate student, Dr. Goldreich recalled, Dr. Porco "was making a deliberate effort to become tough, and she succeeded."

Dr. Porco found an ally and friend in Carl Sagan, the Cornell astronomer, author and a charter member of the Voyager team, who defended her once when her Voyager colleagues teased her about not being married.

Dr. Porco was subsequently hired as a consultant for the movie "Contact," based on Sagan's novel about a feisty astronomer, Ellie Arroway, who discovers a signal from extraterrestrials.

Although plans fell through for Dr. Porco to meet Jodie Foster, the actress who played Arroway, she did attend a workshop on the script, where she took strong exception to an idea that the character would sleep with her adviser. "She's a let-it-ripper, isn't she?" recalled the movie's producer, Lynda Obst. "She let it rip."

Voyager, Dr. Porco said, was the time of her life. "It had all the elements of Homeric legend," she said. "It was a long 12-year odyssey, punctuated by brief episodes of great discovery and conquest. And then it was back in the boat, oars in the water, until years later we reached our next port of call. It was a defining experience for many of us, and certainly for me."

The chance to channel Dr. Porco's inner Captain Kirk continued with the \$3.4 billion Cassini mission, which was launched on a roundabout course toward Saturn in 1997 and arrived in 2004. Being on the imaging team is like standing on the bridge of the spaceship, she said. "We have the windows," she said. "That's what we're responsible for."

Dr. Porco was chosen over more senior astronomers to head the Cassini camera team in 1990, one of 12 team leaders for the spacecraft. The job swallowed her life, she said, and required her hard-won toughness. "Our experiment has been spectacularly successful," she said, "and that would never have happened if I let people roll over me."

But Dr. Porco said it had all been worthwhile. "Between my participation in Voyager and my role in Cassini," she said, "when comes the time, I will die a happy and gratified woman."

One of the most thrilling Cassini moments was in 2004 when the Huygens probe detached from Cassini and landed on Saturn's largest moon, Titan, a strange, frigid world where rocks are made of ice, and rivers and oceans are formed of what Dr. Porco has described as "paint thinner."

Last month, astronomers announced that they had detected methane storms on Titan, a cloudy moon that has an atmosphere denser than that of Earth.

They also discovered plumes erupting from the south pole of another Saturn moon, Enceladus, suggesting the presence of underground water and prompting talk about a future mission to cruise through the plumes. "Should we ever discover that life has arisen twice," Dr. Porco said, "that would be a game-changer."

The Titan landing, Dr. Porco said in a talk in 2007, should have been celebrated with parades in every major city.

That talk led to another movie adventure. J. J. Abrams, the producer of the television series "Lost," was listening and asked Dr. Porco to consult on his "Star Trek" movie. On a visit to the set, she suggested that a scene in which the Starship Enterprise materialized inside clouds be set on Titan. The scene made it onto the cover of Cinefex, a magazine about special effects in films.

In an interview, Mr. Abrams said: "She helped us feel connected to what Gene Roddenberry had been trying to do. This is our future," referring the creator of "Star Trek."

Cassini endures, and Dr. Porco is a member of the team for the New Horizons spacecraft, which is scheduled to arrive at Pluto in 2015. But she said she hoped to spend more of her time popularizing science and hopes to write a book about Cassini.

"To my mind," Dr. Porco said, "most people go through life recoiling from its best parts. They miss the

enrichment that just a basic knowledge of the physical world can bring to the most ordinary experiences. It's like there's a pulsating, hidden world, governed by ancient laws and principles, underlying everything around us — from the movements of electrical charges to the motions of the planets — and most people are completely unaware of it.

“To me, that's a shame.”