

Space for Women – 1981

Astronauts / CAPCOM: [Inaudible communications]

Narrator: There are many things in the history of the world that were once thought to be impossible.

Astronauts / CAPCOM: [Inaudible communications]

Narrator: As the Earth speeds around the Sun at over 60,000 miles per hour, we are coming to realize more and more many of the problems and obstacles that daily confront us are, in reality, merely opportunities, opportunities to break free of fears and ancient taboos. And we are discovering too that the very process of freeing ourselves forces us to learn more and more about ourselves and the world in which we live.

Dr. Patricia Cowings: For an awful long time – 2,000 years – people assumed that there was a schism between the mind and the body; there was the intellect and there was emotion. But only until recently we would realize just how much of the time we actually influence the ongoing physiological activity in our own bodies by what we think about. Every stimulus, every stimuli in your environment that impinges on an organism is reflected to some extent physiologically.

Narrator: At the National Aeronautics and Space Administration a number of scientists are deeply involved with programs that foster the development of the mind.

Dr. Patricia Cowings: As a psychophysicologist I study the ways in which people adapt, adjust to stressful environments, and working within the space agency really affords a rather unique opportunity for a psychophysicologist to see people working at the limits of human capability. If it's possible to understand the ways in which people adapt to the unusual environment of zero gravity and sustained weightlessness, sustained long-duration manned space flight, then it's possible to understand really how people adapt to unusual environments on the Earth.

Astronauts / CAPCOM: [Inaudible communications]

Narrator: There are many lessons to be learned from nature and from the universe through which our world spins. Chief among these is the fact that the world is changing rapidly and at a rate faster than our most sophisticated technological inventions can perceive or record. As we humans strive to keep pace with these changes, the development of the human mind becomes increasingly crucial to our survival.

Dr. Patricia Cowings: What I began to study in graduate school was psychosomatic health. If the mind can make you sick the mind can make you well, and that's essentially the basis of the research that I and several hundreds of researchers now are working on within an area called behavioral medicine.

Man: What are we measuring here?

Dr. Patricia Cowings: Well, you know, we're measuring EKG here. But you remember that the major symptoms that you showed in the first and second tests were heart rate changes and you

showed significant constriction of the blood vessels in your hand. So if you just remember those two exercises and keep your breathing paced you should be okay on this test.

Man: Okay.

Dr. Patricia Cowings: But you know, you just do the best...

Narrator: Dr. Patricia Cowings is a psychophysiological whose specialty is behavioral medicine. She's one of a growing number of women working at the highest levels of responsibility in the scientific community of NASA. Her research will help to unravel some of the mysteries of survival in outer space.

Male Voice: Left. Up. Right. Up. Drop. Up.

Trudy Phillips: SCA Pilot Fitz Fulton has called out the proper separation altitude. Five, four, three, two, one. We do have separation. Chase planes are calling. Clear. The orbiter has nosed over and is now on its way to the final descent to the runway.

Narrator: It was in the early days of the space shuttle, when it was first testing its wings, that women and minorities began entering the professional ranks of NASA. Trudy Phillips was one of those women.

Trudy Phillips: Pilots in the orbiter are Joey Engle and Dick Truly. The orbiter crew has pitched the nose of the orbiter down. They should be making their final descent any minute. The orbiter is coming in over the runway at Edwards. They should have touchdown momentarily.

Narrator: The more you think about it, the more apparent it becomes that human intelligence will be of increasing importance in the future survival of the human race. On this spaceship called Earth, we are learning to respect that intelligence in whatever form or color it appears.

When the first space shuttle was tested in the mid-1970s, the director of the space shuttle operations at Dryden was an ex-Air Force test pilot named Ike Gillam. Since that time, Gillam has been promoted to the position of director of Dryden Space Center in California. It was from him that the first female and minority group astronauts received their introduction to the *Enterprise*, NASA's first space shuttle.

Ike Gillam: From wing tip to wing tip is baseline to baseline on a tennis court. Capable of standing about 700 degrees of temperature, and the highest temperature resistance portions we have is the leading edge, is the wing – this reinforced carbon-carbon – and, you'll notice when we get around front, the tip of the nose.

Narrator: In the twenty-first century, the ranks of our space travelers must be filled with people of not only high intelligence but great stamina. Because the challenges of outer space will be many, each one of those challenges will represent a seed of opportunity for human growth.

To achieve this growth, all prejudices, taboos, habits of human thought must be cast aside, for the safety and survival of a spacecraft depend on the excellence, both mental and physical, of all on board. How do these newest space travelers feel about being astronauts?

Narrator: When you were first made aware of the fact that you had been selected, how did you react to that?

Dr. Kathryn Sullivan: Well, you have to appreciate I was in the middle of writing a Ph.D. thesis, and that tends to swamp out a lot of other things. And I was obviously very excited, and I remember the morning, and the whole day in fact, quite well and was very happy and very excited. But then all the press activity took off at such a tremendous rate, too, that that sort of masked over personal celebrations and personal reactions. It was an incredibly busy and exciting day, but it was just a great big blur too.

I happened to go to a school for my bachelor's degree where grades were not actually given; you were given a pass or a fail and a critique was written by the professor of how well you had done in the class. You didn't get just a letter grade.

Professor: By the authority vested in me by the senate of Dalhousie University I admit you to the degree of doctor of philosophy with all the rights and privileges thereto pertaining. And I congratulate you.

Dr. Kathryn Sullivan: But still, I always found that my performance in the class was best, my results from the professors were best, when my own motive was to learn the most I could. And as I say I never aimed for the space program as such. All I really thought about was that nothing was worth doing unless you were willing to do what was needed to do the job well. Self-discipline I think is the top, the most important factor. And I think it's also important to realize the responsibility that each person has towards all the other people around them. Waxing philosophical, I think we show each other many, many lessons just in day to day life. And we can learn a lot from each other; we can give a lot to each other. And that will only reach its highest point if each of us individually tries to do the best we can. That's true for a high school exam or a Ph.D. or being an astronaut. You can't just do it for yourself. It does count.

Narrator: Reaching, reaching the highest point: this is the dream that has sailed across the skies of the human mind for a very long time. That highest point is the point at which we achieve excellence in whatever we do. But that excellence must start here on Earth in the objects and structures we build and in the many jobs we perform. At NASA there are numerous jobs, each crucial to the space program as a whole.

Brenda Willis: I monitor hazardous operations such as construction sites, making sure that they are following OSHA standards, the Occupational Safety and Health Act. We're mostly concerned with investigating potentially hazardous situations on the job for both contractor and NASA personnel, most anything that's potentially hazardous. I became a safety specialist through a specialty training for entry professionals. And we go through the process of just applying for the job, then we're evaluated and selected.

Narrator: Brenda Willis is one of a growing number of women who are deeply involved in the various programs and projects of NASA. Is it necessary for a person to have a Ph.D. to advance in the workforce of NASA? Not at all. There are so many different ways in which a person can pursue a new career within this organization.

Narrator: How did you get your start Ms. Willis?

Brenda Willis: In high school, they had the program, you know, where they would go around and recruit students that were interested in the secretarial field who had had some experience in typing and shorthand and things of that nature. And I started out in the clerical field with NASA. And by taking the civil service exam, you know, I came into NASA as a clerk typist and just worked myself, you know, right up through the ranks by going to college in the evenings.

Shirley Chevalier: I've worked on the shuttle program since I've been working here at NASA over the 5 ½ or, if you count the contract time, 6 ½ years that I've worked here. And it's very fascinating, especially when you watch the shuttle orbiter, just glides in and lands on target. You get goose bumps knowing that you were an active part in making history happen.

Well the space program has always held a fascination to me. I can remember when they first landed on the Moon. We sat up all night; my mother was making hot chocolate and she was sitting there and we were, all of us kids were sitting around the television set waiting for the purple people to come out and eat up the astronauts. [Laughs] I have to admit that I never believed that I would actually be here taking a part in all of this technology and all of this going to the Moon and unique happenings.

Narrator: Shirley Chevalier is an electrical engineer on the space shuttle. Shirley Chevalier, how did you become an engineer?

Shirley Chevalier: I graduated from a high school that had a senior class of about 38 people, and it's a central Texas town of about 2,000 people. So if you were considering a profession, you either had the doctor, who was a role model, or you had the schoolteachers, who were role models. And I was afraid of the sight of blood and teachers didn't make enough money. So my oldest brother was in his sophomore year in college majoring in civil engineering when I graduated from high school. So about that time he asked me, "Well, what are you gonna do?" I said, "Well, I imagine I'll go to college." He said "Well, what are you gonna major in?" I said, "I don't know, maybe engineering." He said, "Well, forget it." Said "I'm a fellow and engineering is rough for me." He said, "I don't think you could make it in engineering." And I said, "Well, I think I can." He said, "Anyway, which one are you gonna major in?" And I said "Well, how many kinds do they have?" And he says "Well, there's civil engineering, architectural, mechanical, and electrical." And I says "Which one is the hardest?" And he said, "Electrical engineering." So I said, "Okay, I'm majoring in electrical engineering." And I graduated in May of 1971 with a degree in electrical engineering.

Narrator: Today, women are pursuing a wide variety of careers in space and science. Take Sue Norman, for example. She first came to NASA as a research scientist. Since that time she has worked in several other fields. Her current job involves work in aerial and satellite photography.

Susan Norman: We use both aerial photography and satellite imagery to help in analysis, vegetation analysis. There are two U-2 pictures which were taken from a side-looking angle at 65,000 feet. They're color infrared pictures and we use color infrared because it tells us more about the vegetation on the ground, whether it's healthy or whether it's diseased or its state. And these pictures are of northern California, the Eureka - Humboldt Bay area. You can see the

mountains in the background that have snow on them. And if you look closely you can also see a little bit of the curvature of the Earth.

Susan Norman: Okay well I think, let's see. We have two maps. This one is a map of the state of California that shows the places, whereas the satellite passes over, it takes sort of one picture.

Narrator: What made you think initially of a career in space?

Susan Norman: Well, there were quite a few. Number one: when I was going to school I didn't belong to a very wealthy family and so I really wanted to get a job and go to college and, you know, have something where I could make some money, so to speak. And they had the Space Act, you remember, where they would give students loans if you would go into science, and I didn't really have enough money to go to school and my family didn't have enough money either so by taking science classes, well just the whole impetus of the space program in the early sixties, I was able to get loans to go to school. So that was part of it, because they would give me loans as long as I was in science. But I also wanted science, you know, I felt a natural inclination toward that as opposed to English. I'm not a very good speller and I can't write very well so it seemed like what was me was really science. I kept flunking English and other types of things like that.

Narrator: What about the business of your being a woman here? I mean do you feel you have encountered any kind of, well, special problems working here because you are a woman?

Susan Norman: Well, any special problems. I think the answer is yes. I mean if you're going to be honest you have to say yes. There are just not that many women in the professional or scientific field so you find yourself being a minority, in the midst of – in a sense not a minority, women are half the population – but when I first came to Ames there was one other woman in my group of about 30 men, and no minorities. The present group I'm in, as you can see, there are a lot of women. And just having the opportunity to talk with other women and share experiences, at least for me, has been really helpful and kind of fun, too. And I think in that sense it is changing.

Narrator: The world is changing, changing rapidly. And so are our thoughts about ourselves and those around us. This is Sharon Orkansky; she's a computer specialist at NASA. How did she begin her career?

Sharon Orkansky: When I went out looking for a job, I had sent out 85 applications and I went to a lot of different companies in the area. And a lot of the companies were production-oriented and you do one thing to fit the needs of the company. And when I came here, I mean, I'm seeing simulators and wind tunnels and animal centrifuges and all kinds of neat planes, Learjets. I mean, that's, that's just really exciting for me to work on it. And every job is different; I can't say that I've ever had a job that repeats a second job. I mean, they're all so very different and I enter a new field every time.

What happened was when I applied here, there was a person in front of me, I couldn't get in; there's like the veteran points, and I have no veteran points or any kind of points. So they were gonna bring me on, a special 5 by 5 program, that's where you work half-time and go to school

half-time and get paid full. And so I applied for that, and I applied to Stanford University and got accepted, but then NASA had a regular position for me so I just came in as a regular NASA employee, NASA-Ames employee.

Narrator: Do find that you have encountered any problems working at NASA, I mean, because you are a woman?

Sharon Orkansky: I would say maybe not having the background that a lot of the men have had as children. You know, you grow up and you're dad shows you how to fix a car or fix the stereo. I never had that kind of training as a child. And I feel, I mean I never did anything with circuits until I got into engineering. I mean I just never, you know, toyed around with it, and that really holds me back. I mean just getting out there and getting your hands dirty, I am a little slow at. I'd see that maybe as being a woman holding me back. As far as dealing with people, I'd almost say they're more willing to deal with me because I'm a little bit different. You know, they want to see "Oh, what's a woman engineer really like."

Narrator: Since you have been a part of the NASA team, have you found that you encounter any problems being a woman?

Dr. Patricia Cowings: I think I have more problems by virtue of the fact that I'm short. I'm the shortest person in my lab. Most of the people who work here are older than I am; the majority of them are men. I really don't have that much of a problem working with people who are older than I am and who are men because, as it turns out, they realize that I'm the principal investigator and I'm the one that's directing this program, and you can get people to work with you without being pushy. Not telling them what to do, you simply explain to them that it's the best idea, you know, or that it's for all of our mutual benefit. Being short is a little difficult though, you know. Do this, do that, everybody seems to be taller than me. But what are you gonna do? I wear heels a lot.

Narrator: As we approach the twenty-first century, there is much to learn about our world and ourselves. This learning occurs best in a climate of equal opportunity. In that sunny climate, human intelligence, trust, and total commitment can prosper. We become the winning team.

Presenter: For purposes of testing equipment, we no longer had need for that. We gave that up about three years ago. But that is where the water immersion facility will be built, and we will be...

Dr. Anna Lee Fisher: I would like to go into space for a couple of reasons. The space program meets my particular academic needs, gives me something that's intellectually challenging, also physically challenging. But much more important, I think that man needs something to dream about. We've explored our world fairly thoroughly. I realize that the ocean's remaining, and that's three-quarters of our world, but there's really just two frontiers left: the ocean and space. And I'd like to be part of that effort.

I certainly feel that women are here to stay as part of the space program. You know, this time all the women selected were selected as mission specialists. I certainly feel that in future selections, with women training as pilots, that there will be women selected as pilots. I think we're here to stay.

Narrator: Who is to say who will succeed or fail in any task we Earthlings undertake? For is there really any difference between the minds of males and females? The women of NASA don't think so and neither does NASA, for it is generally agreed that differences in performance occur when there is a difference in opportunity to learn and to gain experience.

Dr. Patricia Cowings: When I was picked about a year or so ago to be a backup payload specialist on a dress rehearsal of a space shuttle flight, I was afraid at that time because I thought well maybe, maybe I really can't do it. But as it turned out, I was picked because of the investigators who had submitted experiments, just as it'll be for an actual flight, the payload specialists assigned as astronauts are chosen because maybe there's some particular characteristic of their own experiments that would make them, themselves, be the best person to conduct an experiment. And also because their background, their educational background, is varied enough to be able to adequately carry out other people's experiments onboard. And as we went through the simulation I found out that I could learn what I had to learn, that I was doing just fine.

Mission Control: Three, two, one. Fire.

Narrator: And so, as we approach the twenty-first century, drifting through the universe at almost a thousand miles per minute, increasingly we are coming to realize that equal opportunity, intelligence, excellence, and teamwork, rather than race, creed, color, or sex, are the keys to success in space travel, whether we happen to be aboard a space shuttle or onboard our mother ship Earth.