





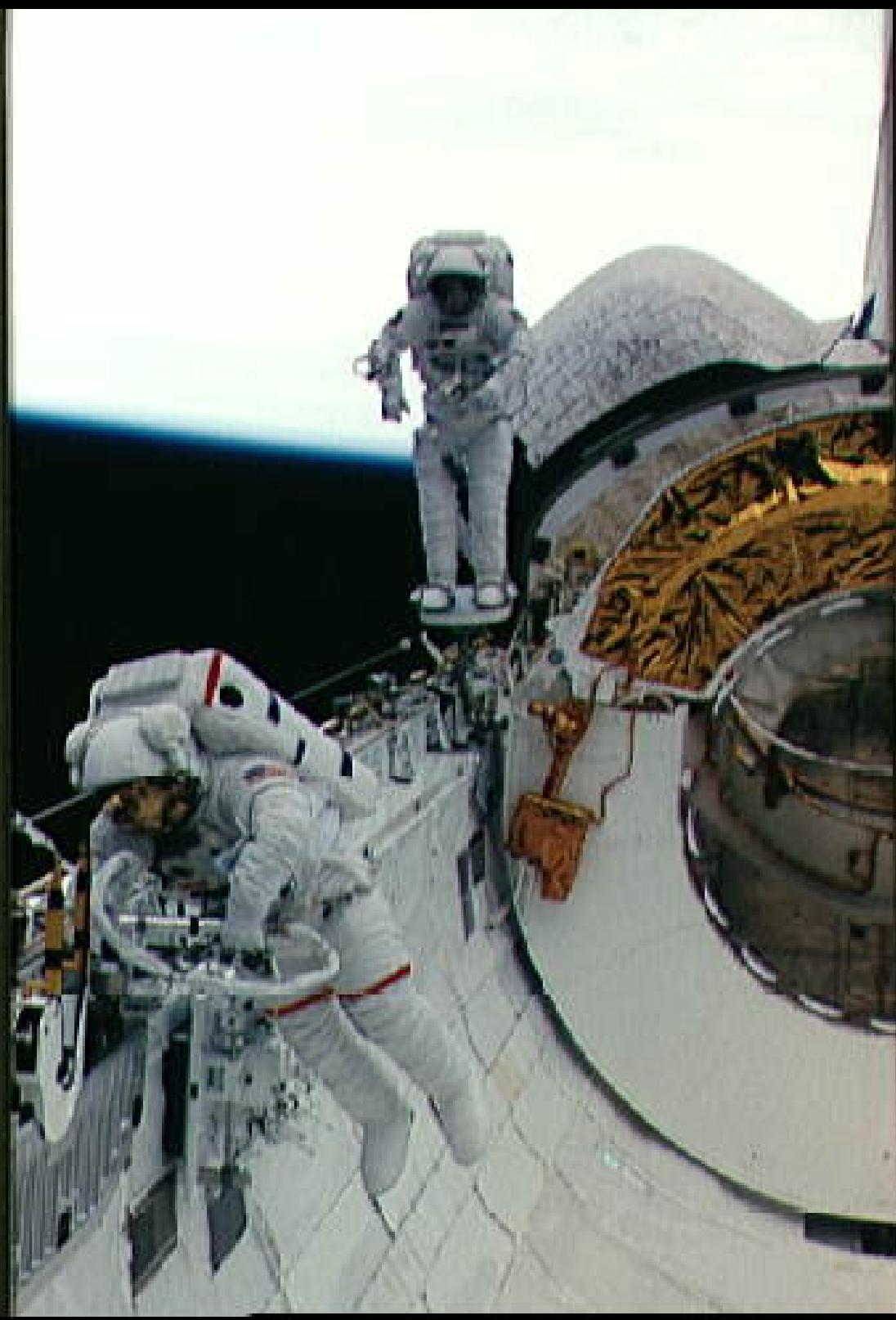


NASA

National Aeronautics and
Space Administration

STS051 16 028

Lyndon B. Johnson Space Center
Houston, Texas 77058



BRAINS WHO SURF

Donald Cram, 74

La Jolla, California

By Sam George

"There's a certain amount of romance associated with research. Ask any chemist. And there's also a certain element of romance associated with surfing, with being a surfer. I think the two go very well together."

Take it from someone who knows: Dr. Donald Cram, Ph.D., biochemist, professor, writer, lecturer, Nobel Prize winner and...a totally stained surfer.

Actually, it is not really so strange. Just think about life in the lab: endless days and nights pouring over scientific minutiae, logging the kind of hours that earn you a master's degree from the University of Nebraska in just months and a Ph.D. from Harvard in 10. It's an egghead's odyssey. Deep inside you want to be a fly—maybe a fighter pilot, even, just your draft board flings you into defense chemistry, and you spend World War II working on penicillin development. Then you're out and back into the lab, the microscope, the research, occasionally looking up and out the window to where the wild wind blows. And despite the security and the lab's safe familiarity and all of the arcane success, you have to ask, "Where do I go from here?"

"Surfing," says Dr. Cram, now 74 and living in La Jolla, "had such a nice aesthetic quality. I had grown up back East—I sailed in Vermont since I was 4 years old—and gone to school in Nebraska. I just figured that the

West Coast was the place to go. So I came out here and really got into it."

Cram did a little research and decided to learn how to surf at Malibu. Already in his 40s ("I'd certainly by starting at such a late age, I would never become an expert surfer"), he found the Malibu lineup much too competitive and gravitated south toward gentle San Onofre. He has been a regular fixture at Old Man's ever since.

Subsequent surfable have taken him all over the globe.

"I arranged a lecture tour in South Africa in 1964, right after I saw that surfing movie that was so appealing (*The Endless Summer*). I really just wanted to go over there and surf. And I got very good waves at Jeffreys Bay."

Dr. Cram might have remained just another soul guy at Old Man's with a lot of neat stories if not for the fact that his lifetime of achievement in biochemistry, and particularly his work in molecular containment, earned him the 1967 Nobel Prize. The award recognized decades of teaching and research, seven books, three texts translated into a dozen languages, and his breakthrough work in molecular chemistry.

But talk to Dr. Cram today and mostly he likes to talk surf. A hip injury has kept him out of the water lately, but he sounds as stoked as ever.

"I'm proud of being a surfer," he says. "The fun I've had and the friends I have made, especially at San Onofre—those are the things I really prize."

DONALD CRAM



Jim Newman, 36
Houston, Texas

By Steve Bariletti

NASA officials call it "extravehicular activity." Others, a "spacewalk." But for Space Shuttle Mission Specialist Jim Newman, floating weightless over the globe 180 miles up, it's...space surfing.

Newman should know. As a lifelong surfer from La Jolla, California, the 36-year-old astronaut not only knows his way around the outside of a spaceship, but also can stroke his way out to the winter lineup at Big Rock. A cosmic goofyfoot, as it were.

"Of course, it's nothing like real surfing," admits Newman. "In zero gravity there's no sensation of speed like an ocean wave. But there's this photo taken from the flight deck where I'm standing in a way that reminds me a lot of surfing. Looking down between my feet, I could see the surface of the earth going by about 17,500 miles an hour. That was phenomenal."

The lean, soft-spoken Newman was part of a five-man crew on the Space Shuttle Discovery that launched last September. Glad in a bulky, self-contained spacesuit and tethered to the orbiter by a thin nylon line, Newman and fellow mission specialist Carl Walz floated in the freezing vacuum of space for six and half hours. During their orbital stroll while testing new high-tech power tools to be used to repair the malfunctioning Hubble Space Telescope. From their stellar lookout they could clearly see human activity on the globe—including a gassy pall of smoke from slash-and-burn agriculture in the Amazon rain forests.

Newman, 36, was born on the tiny western Pacific island of Truk, where his father was a teacher. After following the academic homestead trail from Berkeley to Belmont, Massachusetts, the Newmans (Jim has two brothers, Hans and Eric) settled a block from Big Rock in La Jolla. Jim says he was inspired to become an astronaut after watching Neil Armstrong's historic moon walk in 1969.

"I figured that by being an astronaut you could combine a lot of different things—flying, science, engineering, travel—all in the same job. Turns out I was right. That's what I love—every day is something different."

Jim started surfing in the late '60s at La Jolla Shores, Pacific Beach Point and Windansea with his older brother Hans. Hans, 38, who is still an avid surfer and has a huge collection of classic boards, recalls that his brother liked to have fun—whether



JAMES H. NEWMAN PHOTO COURTESY OF NASA

it be surfing, sailing or flying radio-controlled gliders—but never at the expense of his schoolwork.

"We didn't quite know what to make of Jim when he was a kid," recalls Hans. "For fun he'd check out books from the UCSD library and do math problems all weekend. Then he'd run up to the cross at Mt. Soledad (a steep hill overlooking La Jolla) and back to surf at Big Rock every morning before breakfast. He's always been absolutely focused like that. When he was 15 he said he wanted Mars. When he was in college he wanted the moon. By the time he got into the astronaut program he said he'd settle for space. And he did it."

Back on Earth, Jim took enough time away from his hard-core studies to log some legitimate surf time. He says the apogee of his surf career came on a big winter swell in 1972 when he rode a set wave at Hogan's (a fickle shelf reef near Big Rock) on a 7' 6" Hawaiian gun left behind by Hawaiian legend Jeff Hakman.

Following graduation from La Jolla High in 1974, Newman left the beach for landlocked studies at Dartmouth and later did his post-graduate work at Rice University in Houston so he could be near the Johnson Space Center.

Despite his qualifications and aptitude, it took Newman three tries before he made the final cut over 2,000 other qualified applicants. He was working at the Johnson Space Center in Houston training other astronauts in orbiter propulsion, guidance and control when he was selected by NASA for the Astronaut Candidate Program in 1990. After a year of training—which included flying copilot in a jet fighter—he joined the astronaut corps in July 1991.

"The fitness, the sense of balance and agility I gained from surfing certainly helped in my physical training," Newman said. "Also, the ability to make quick, accurate decisions. When you've got a wave jacking up on you at Big Rock, you've got to think fast. Same thing in space travel."



JAMES H. NEWMAN PHOTO COURTESY OF NASA

Kary Mullis, 48
La Jolla, California

By Scott LaFee

The call came at 6 a.m. Two Swedish guys saying something about winning the Nobel Prize. Groggy and understandably skeptical, Kary Mullis figured they were joking.

Then the fax came. It was from the Royal Swedish Academy of Sciences. Mullis really had won! A Nobel Prize for chemistry. The pinnacle of scientific fame. Instant international renown. A reputation set for life. Mullis thanked the Swedes and did what he does almost every morning:

He went surfing.

"What can I say? I love to surf," said Mullis, sitting beside a flock of inflatable penguins in his little La Jolla apartment. "Surfing wakes me up. Where there aren't any waves, I have a hard time getting out of bed."

Bobbing out on the swells, waiting for a set at Tourniquet, the 48-year-old Mullis doesn't look like a guy who changed the face of science. But that's basically what he did by inventing a laboratory process called the polymerase chain reaction.

PCR, as it's better known, allows scientists to take an incredibly tiny amount of DNA—the biological blueprint of life—and replicate it over and over, producing in a single afternoon perhaps a billion copies.

With a sudden and virtually infinite amount of DNA to work with, scientists throughout the world have made remarkable discoveries. PCR has helped researchers trace the evolution of mankind. It has been used by doctors to identify the genes responsible for diseases like cystic fibrosis. Police labs routinely use PCR to link crime-scene evidence, sometimes no more than a strand of hair or drop of blood, to suspects. The ability to duplicate dinosaur DNA captured in amber—the real-life inspiration for *Jurassic Park*—was only possible due to PCR.

Mullis conceived of PCR in 1983 while driving to a cabin he owns in rural Mendocino County.

At the time, he was a semi-towly staff chemist for a biotech company. In gratitude for his discovery, the company gave him a \$10,000 bonus. Then it sold the PCR patent to another company for \$300 million.

But Mullis isn't complaining. He's done pretty well simply by accepting the numerous awards stemming from his invention. A Japanese science foundation, for example, gave him a check for more than \$160,000 a year. The Nobel Prize, which he splits with another chemist in Canada, is worth \$225,000.

The big bucks mean Mullis can afford to be his own man. He works at home, surrounded by his penguins, plastic boards and surfboards, including one sporting the famous symbol of DNA—the double helix.

Right now, Mullis is working on the idea of selling trading cards embedded with bits of DNA from celebrities like Michael Jackson and Albert Einstein. He's already formed the company. He also wants to write—maybe an autobiography or science fiction.

And, of course, he wants to surf.

A friend introduced him to surfing three years ago. "I'm a pretty fast surfer, and I've got good balance," he says. "I'd probably say I'm one of the best surfers in the world, maybe in the top four."

Mullis laughs. He's kidding, though he does rank himself as above average for his age and experience. He is not, however, a machine. "I don't dream about riding 30-foot waves. I like the smaller stuff and the socializing with friends."

For him that means hanging out at Tourniquet, Scripps Pier and Pacific Beach, where he says the surfers are laid back and willing to share waves.

With the Nobel Prize money in his pocket, Mullis says he might finally take a few surfing trips. "I've talked for a long time about going to Mexico. I'd like to do Hawaii. It would be nice to surf in warm water."



KARY MULLIS







Pierre Ducharme / Reuters

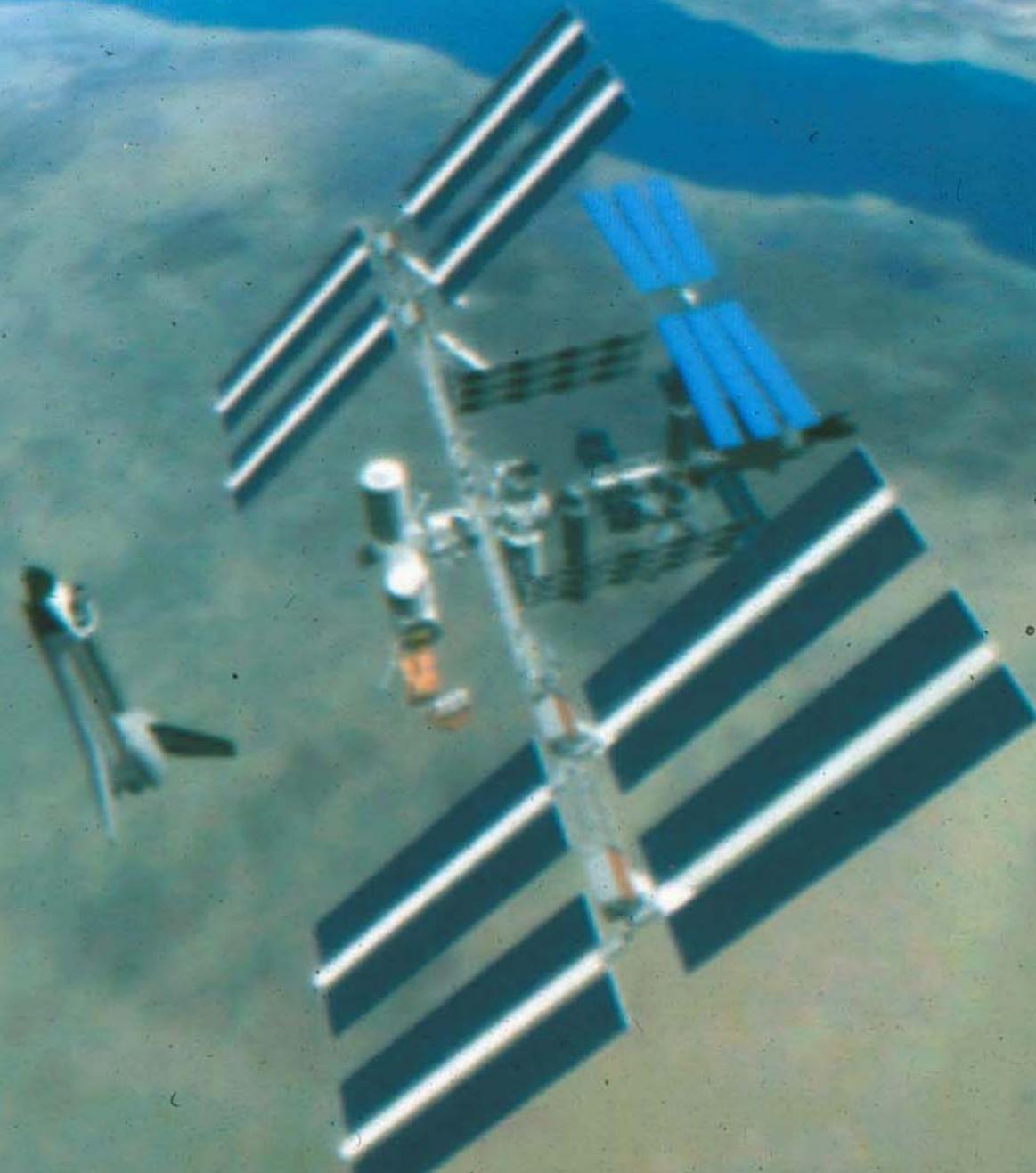








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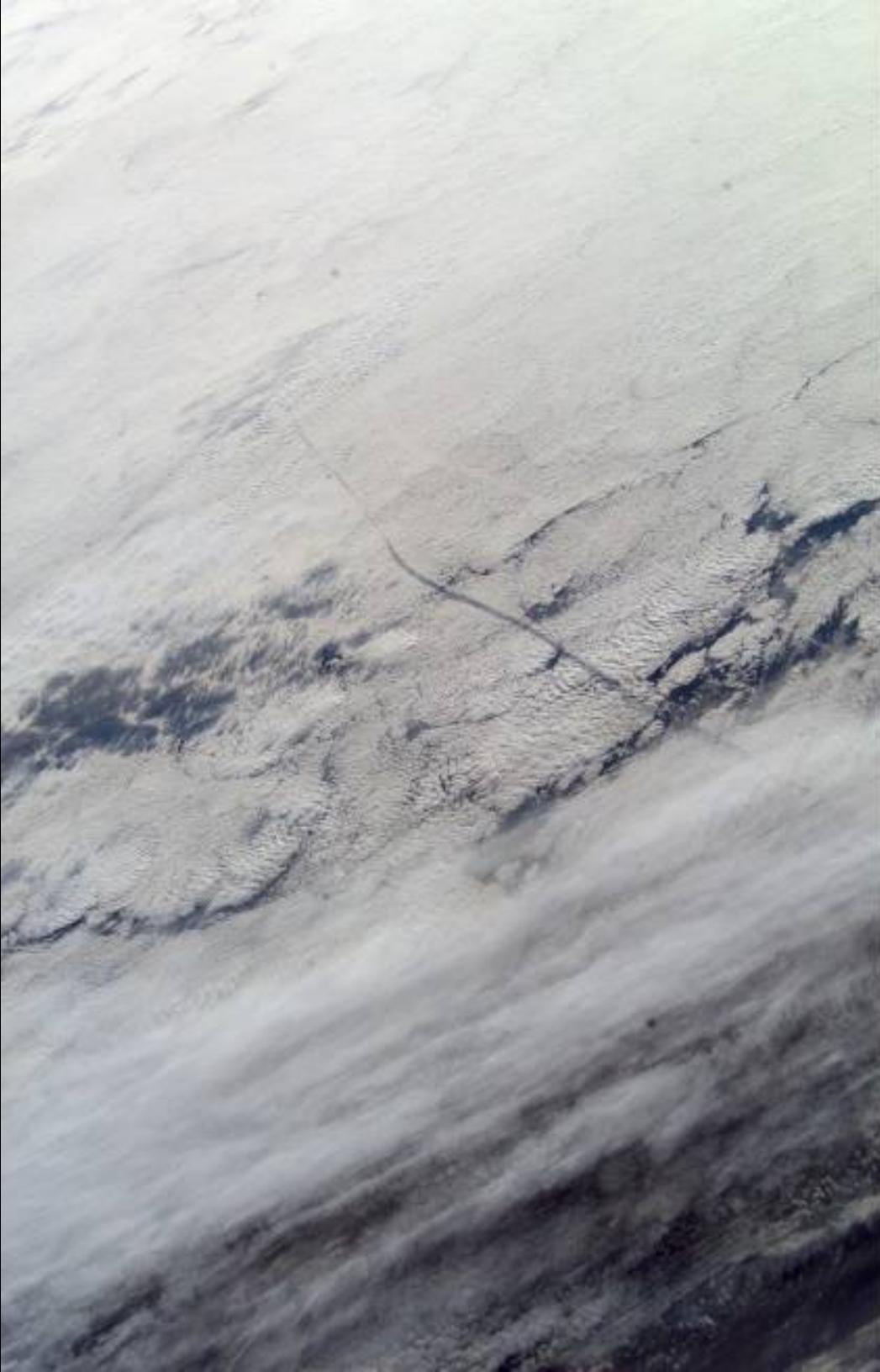




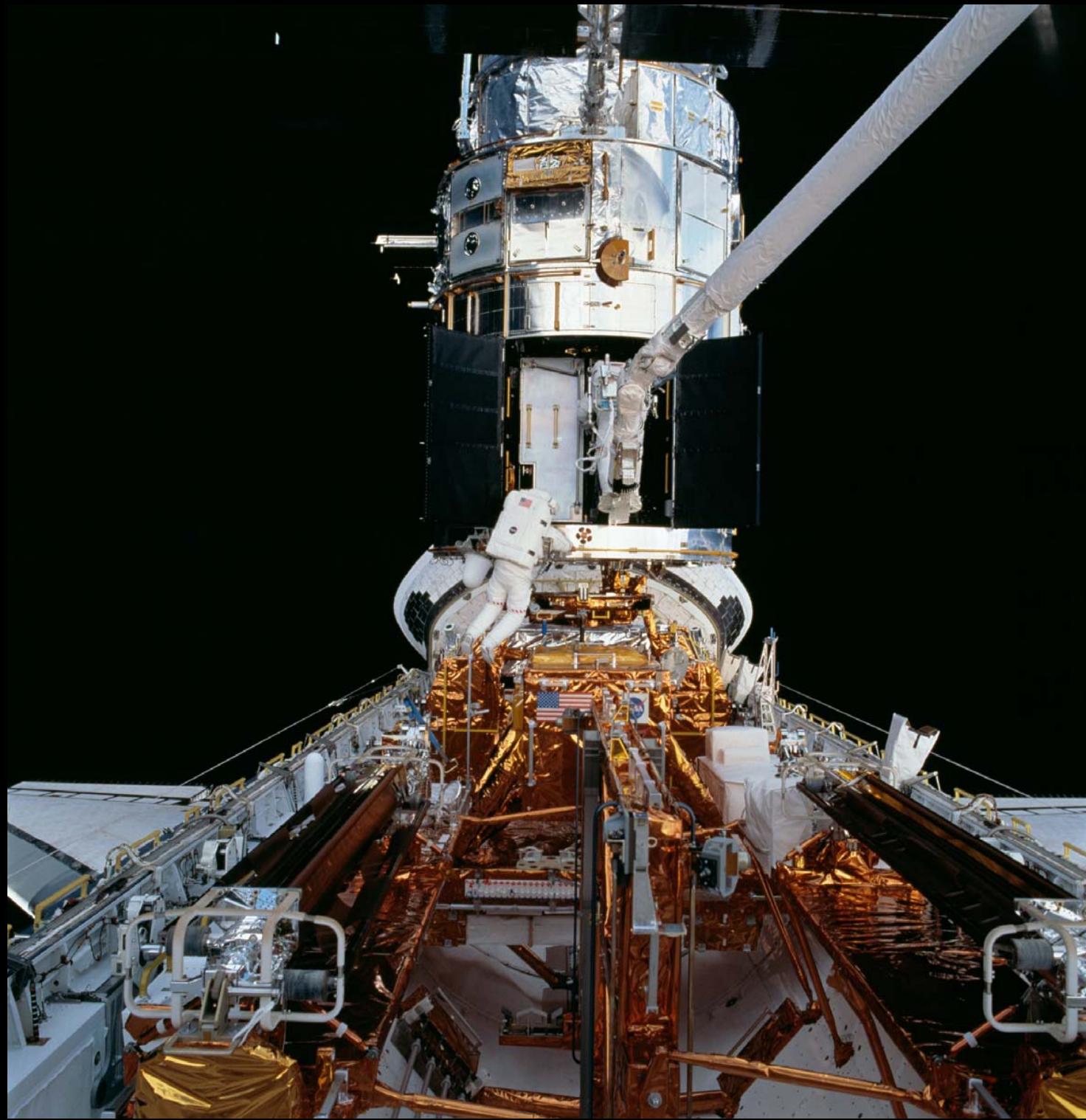


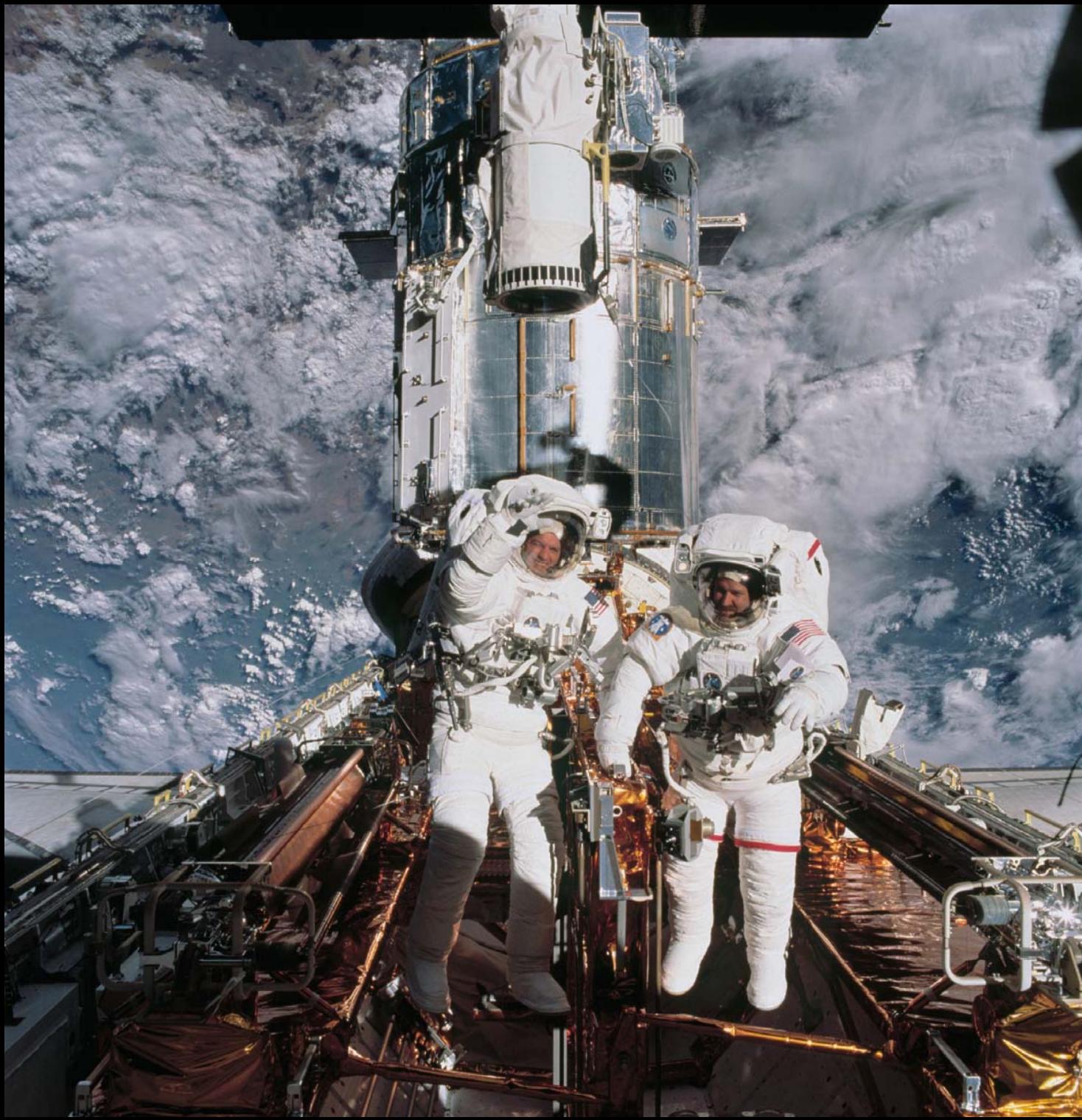






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Hard work



TC next - FB

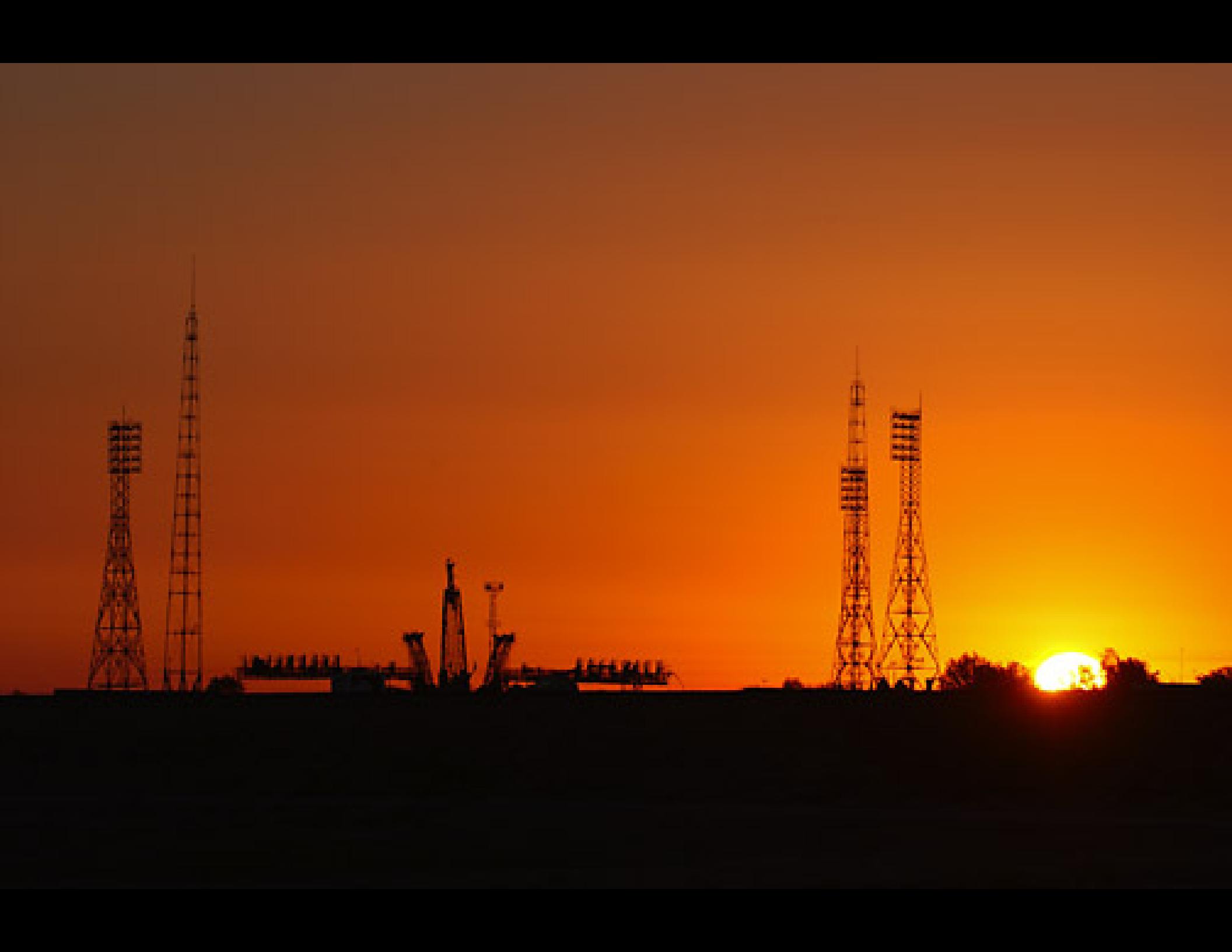






- ACS is reaching Hubble Deep Field Depths in 1/12th time
- Twice as many galaxies detected as HDF















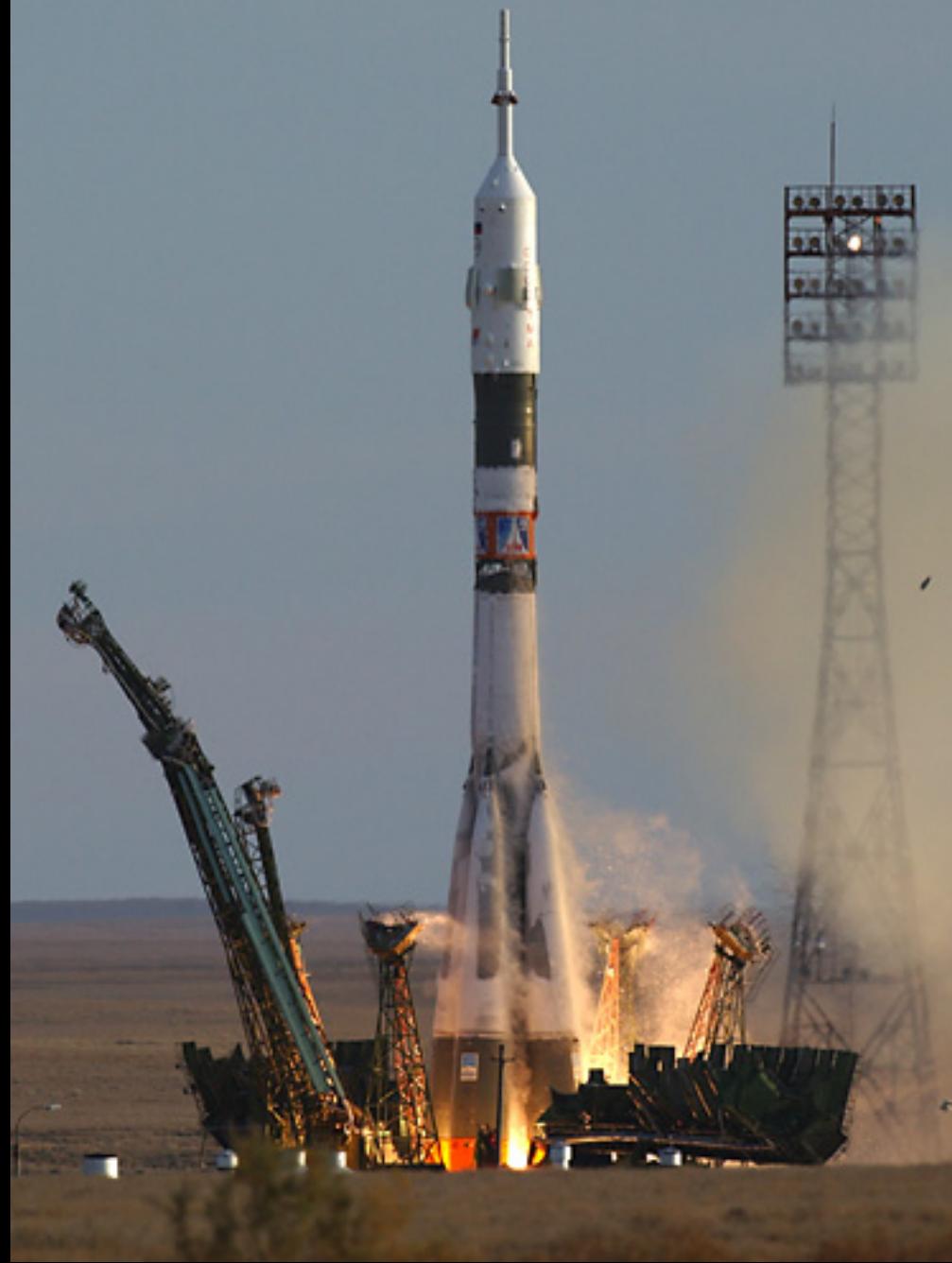
















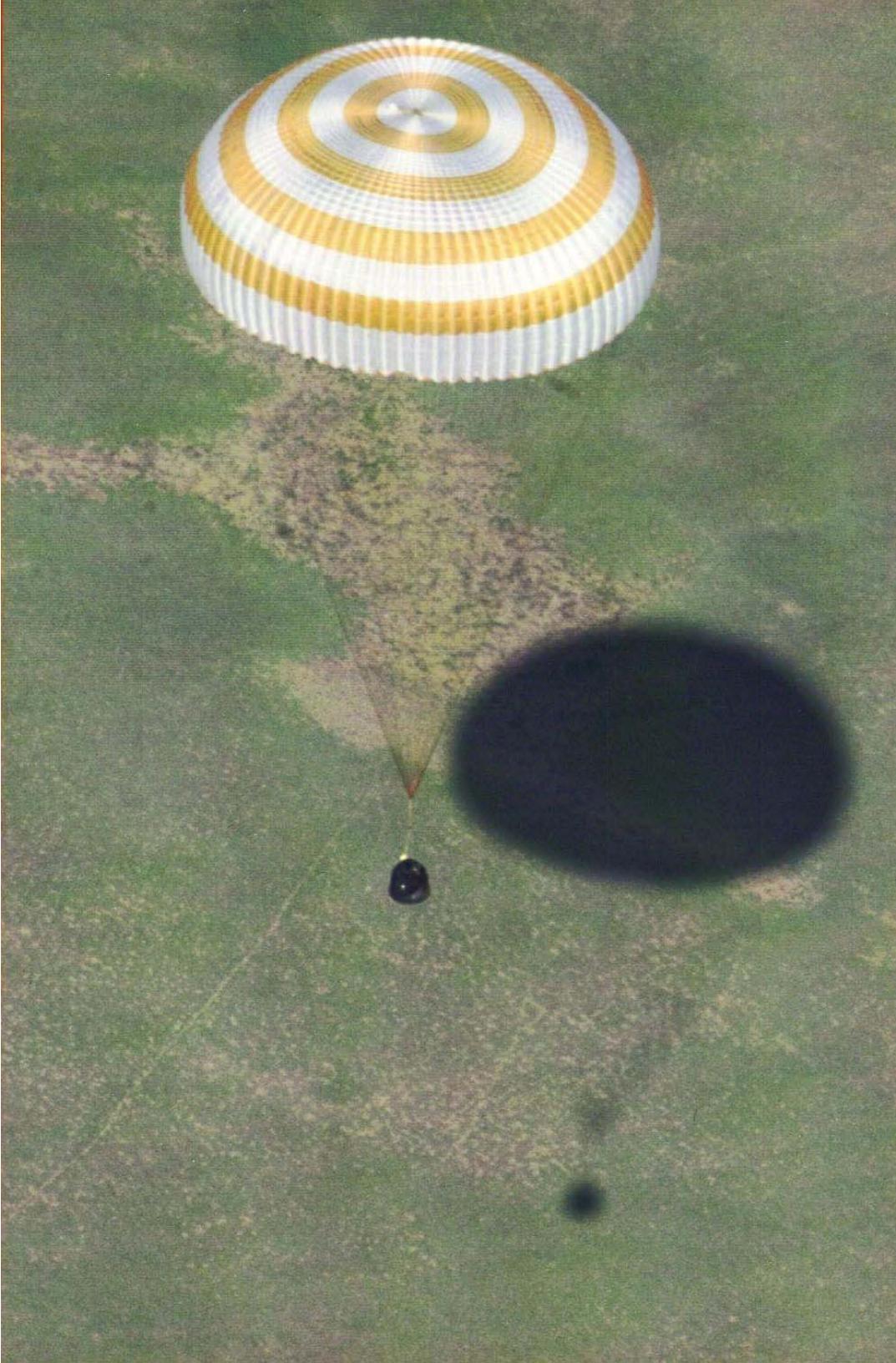








TM-33 landing in Kazakhstan – 5 May 2002







Portable Medical Tent is being inflated.



Tent is ready within about 2 minutes.







Antenna deployed. Hatch is being opened. Area is cordoned off.



The team awaits the first Cosmonaut.



Moving the extraction stand into position



Commander, Yuri Gidzenko, is lifted out first.



Help preparing to come down the slide.



Soft Landing Thrusters turn up the soil.



A Kazakh boy rides out to see the crowd.









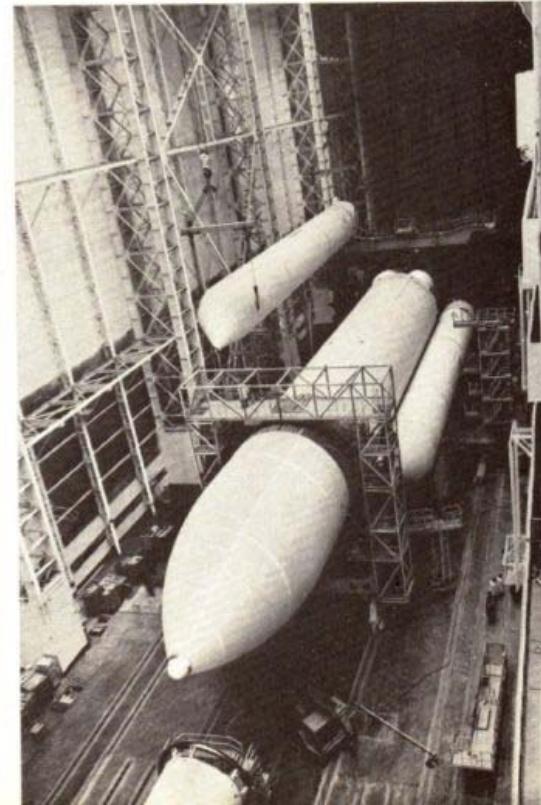
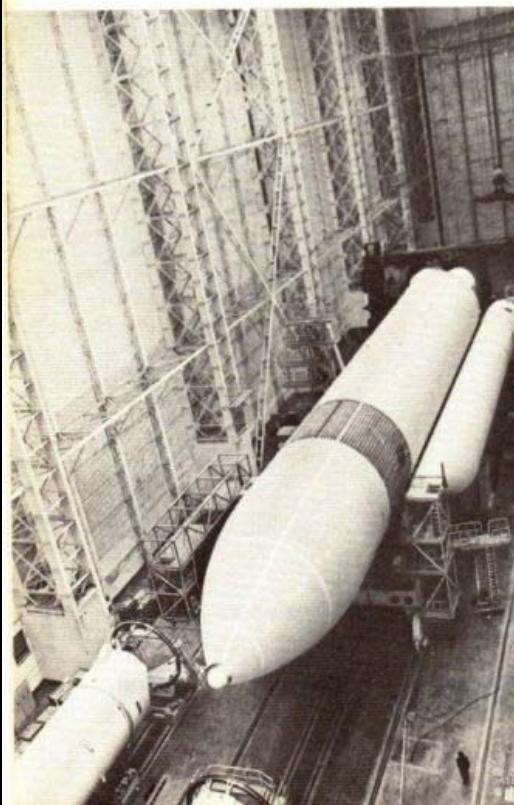
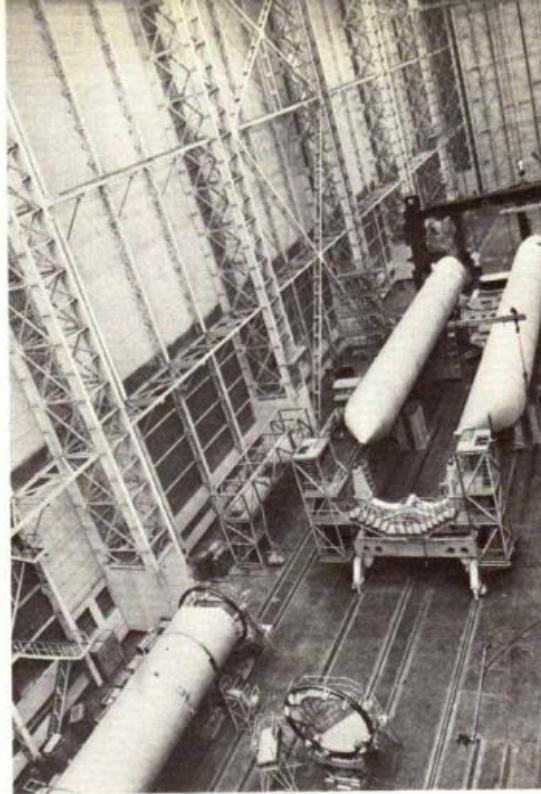
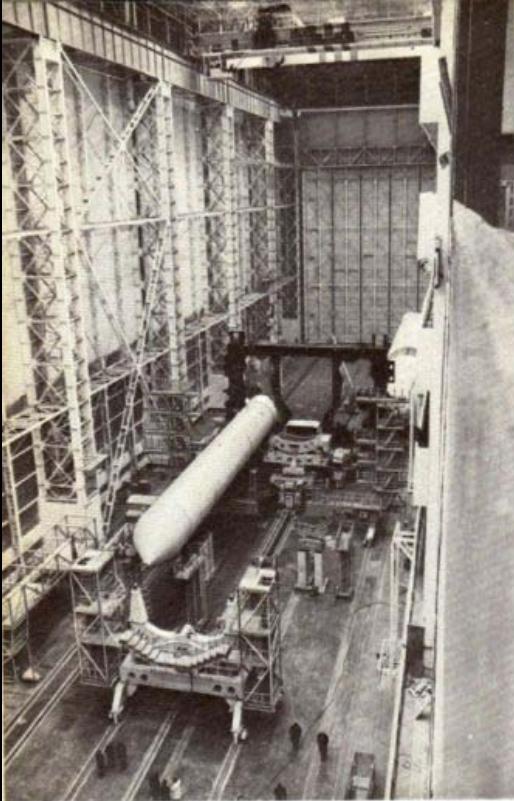




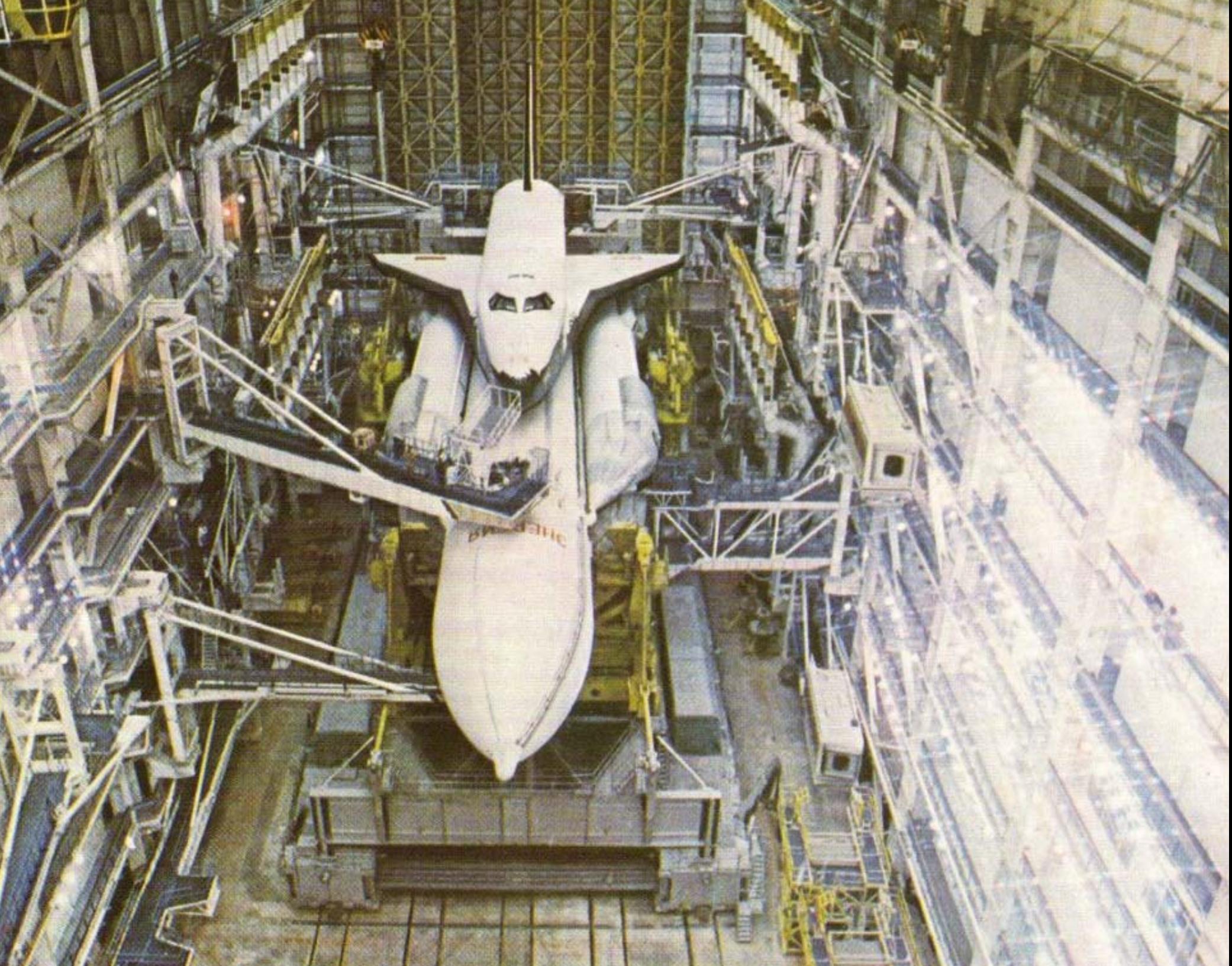


СТАРТ. ЭНЕРГИЯ
THE ENERGIA BLASTS OFF











Вывоз ракеты-носителя "Энергия" с кораблем "Буран" на транспортно-установочном агрегате

Carrier rocket *Energia* with the recoverable spaceship *Buran* are transported from the assembling and refueling hangar to the launching pad of Baikonur spaceport



Ракета-носитель "Энергия" с кораблем "Буран" во время установки на стартовый комплекс

Carrier rocket *Energia* with the recoverable spaceship *Buran* are installed on the launching pad of Baikonur spaceport





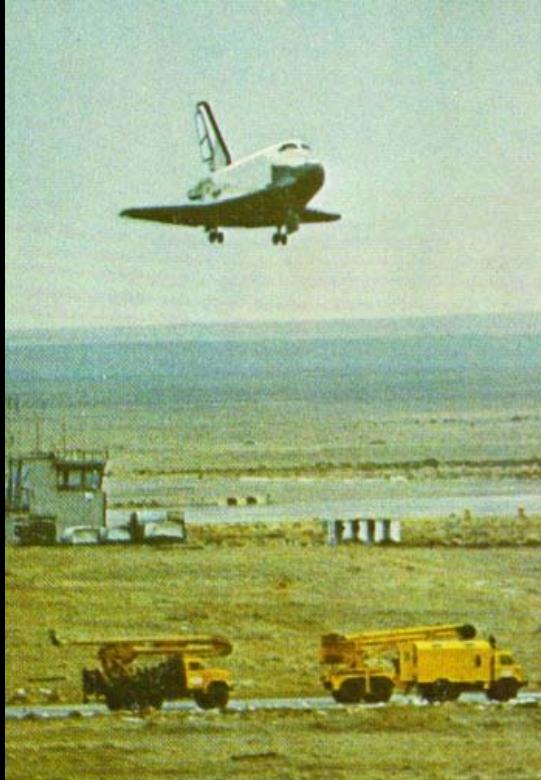
15 ноября 1988 года в 6 часов московского времени в Советском Союзе осуществлен старт универсальной ракетно-космической транспортной системы "Энергия" с кораблем многоразового использования "Буран".

The multi-purpose carrier rocket *Energia* with the soviet space shuttle *Buran* were launched from Baikonur spaceport on November 15, 1988, at 06.00 Moscow Time

Ракета-носитель "Энергия" с орбитальным кораблем "Буран" в полете

Carrier rocket *Energia* with the recoverable spaceship *Buran* in the flight





15 ноября 1988 года в 9 часов 25 минут московского времени орбитальный корабль "Буран", выполнив двухвитковый полет по орбите вокруг Земли, приземлился на посадочную полосу космодрома Байконур

Having made two circuits of the Earth, the soviet space shuttle *Buran* landed at Baikonur spaceport on November 15, 1988



