

JANUARY 28, 1986

CHALLENGER DISASTER



This iconic image from the Challenger disaster shows the fireball created when Challenger's fuel cell failed and the booster rockets separated from the spacecraft.

ACCIDENT TURNED CELEBRATION INTO SORROW

U.S. shuttle program was grounded for nearly 3 years

CNHI

Mission STS 51-L 40 years ago on Jan. 28, 1986, was the 25th carried out by the U.S. Space Shuttle Program and the 10th Challenger flight.

It ended in tragedy less than two minutes after launch when the spacecraft's right booster rocket failed, leading to the shuttle's fuel cell exploding.

The shuttle broke up moments later due to aerodynamic forces. The crew likely died quickly from a lack of oxygen.

Aboard the ship was S. Christa McAuliffe, a teacher from New Hampshire who was chosen out

of 11,000 applicants from the field of education to be the first teacher to fly in space.

Another civilian, Gregory B. Jarvis, was aboard the shuttle. He competed against 600 other employees at Hughes Aircraft Corp.'s Space and Communications Group for a chance to be on the shuttle.

Challenger's primary missions were to launch satellites to improve communication with future missions and to study Halley's comet.

The program restarted 32 months later, following an investigation and corrective actions, with a flight by Discovery on Sept. 29, 1988.



■ Francis R. (Dick) Scobee
 ■ Mission role: Commander
 ■ Born: May 19, 1939, in Cle Elum, Washington.
 ■ Fast fact: Air Force test pilot flew 45-plus types of aircraft, logging 6,500-plus hours.



■ Michael J. Smith
 ■ Mission role: Pilot
 ■ Born April 30, 1945 in Beaufort, North Carolina.
 ■ Fast Fact: Was a commander in the U.S. Navy at the time of the Challenger accident.



■ Judith A. Resnik
 ■ Mission role: Mission specialist
 ■ Born April 5, 1949 in Akron, Ohio.
 ■ Fast Fact: PhD in electrical engineering, staff fellow in the Laboratory of Neurophysiology at NIH.



■ S. Christa McAuliffe
 ■ Mission role: Payload specialist
 ■ Born: Sept. 2, 1948, in Boston, Massachusetts
 ■ Fast Fact: Selected from among more than 11,000 applicants in the education profession to become the first teacher to fly in space.
 ■ Fast Fact, II: Was excited as a youth by the Apollo moon landing program and on her application wrote: "I watched the Space Age being born and I would like to participate."
 ■ Selected by NASA in 1984.



Above: S. Christa McAuliffe, from left, meets fellow STS-51L crew members Mike Smith, Ron McNair and Dick Scobee in September 1985.

NASA photo



NASA photo

The space shuttle Challenger lifts off from Pad 39B on Jan. 28, 1986, at 11:38 a.m. with a crew of seven astronauts and the Tracking and Data Relay Satellite on board.

DID YOU KNOW?

The launch was broadcast by CNN, but at 11:39 a.m. on a Tuesday, when most people were at work or in school and 24-hour cable news was a new phenomenon. Most people watched recordings of the launch.

Many students watched on a satellite broadcast from NASA that was set up due to New Hampshire teacher Christa McAuliffe's role in the mission, making it a pivotal moment in their childhoods.

BY THE NUMBERS

2:45 and 200

Challenger broke up at 65,000 feet before plummeting back to earth. When the cabin hit the ocean's surface 2 minutes and 45 seconds later it was traveling at more than 200 mph.

Top speed shuttles can reach

17,500 mph

10 of 19

Challenger first launched April 4, 1983, and two months later, on June 18, 1983 it took its second flight, this time with Sally K. Ride as the pilot. Challenger became the four-shuttle fleet's workhorse until the 1986 tragedy, launching for 10 of the program's 19 flights over that span.

Cost over the life of the shuttle program. As of 2010, it cost approximately \$775 million to prepare and launch a shuttle. Endeavour, the orbiter built to replace Challenger, cost approximately \$1.7 billion.

\$113.7 billion

Due to the tragedy, Challenger was the least used shuttle in the program. Discovery was the most used. How the shuttles stacked up against each other:

Challenger	Discovery
60	252
10	39
23.6M	148.2M
995	5,830
62 days	365 days

SOURCE: NASA.GOV



■ Ronald E. McNair
 ■ Mission role: Mission specialist
 ■ Born: October 21, 1950, in Lake City, South Carolina.
 ■ Fast Fact: Specialized in quantum electronics and laser technology at MIT.



■ Ellison S. Onizuka
 ■ Mission role: Mission specialist
 ■ Born June 24, 1946, in Kealahou, Kona, Hawaii.
 ■ Fast Fact: Worked on orbiter test, checkout teams and launch support crews for the first two Shuttle missions.



■ Gregory B. Jarvis
 ■ Mission role: Payload specialist
 ■ Born Aug. 24, 1944, in Detroit, Michigan
 ■ Fast Fact: Like McAuliffe, was not a federal government employee. Competed with 600 other employees for spot.

FINAL CONTACT WITH CREW

What follows is the end of the transcript of the Challenger crew's comments from the operational recorder, as provided by NASA to the Presidential Commission:

■ (19 seconds after launch) Pilot Michael J. Smith: Looks like we've got a lotta wind here today.
 ■ (:20) Commander "Dick" Scobee: Yeah.
 ■ (:22) Scobee: It's a little hard to see out my window here.

■ (:28) Smith: There's 10,000 feet and Mach .5.
 ■ (:35) Scobee (Mach) .9.
 ■ (:40) Smith: There's Mach 1.
 ■ (:41) Scobee: Going through 19,000 (feet).
 ■ (:43) Scobee: OK, we're throttling down. (NASA: Normal thrust reduction during maximum dynamic pressure region.)
 ■ (:57) Scobee: Throttling up. (NASA: Throttle up to 104% after maximum dynamic pressure.)

■ (:58) Smith: Throttle up.
 ■ (:59) Scobee: Roger.
 ■ (:60) Smith: Feel that mother go.
 ■ (:60) Woooooohoooo.
 ■ (1:02) Smith: 35,000 (feet) going through (mach) 1.5
 ■ (1:05) Scobee: Reading 486 (air speed) on mine.
 ■ (1:07) Smith: Yep, that's what I've got, too.
 ■ (1:10) Scobee: Roger, go at throttle up.
 ■ (1:13) Smith: Uh-oh.
 ■ (1:13) LOSS OF ALL DATA

O-RING FAILURE

The Rogers Commission determined a failure in the joint between the two lower segments of the right solid rocket booster led to Challenger's demise.

Rubber O-ring seals intended to prevent hot gases from leaking through the joint during propellant burn failed.

Combustion gases leaked through the right booster shortly after ignition, weakening the external tank and leading to the structural breakup of the vehicle.



A puff of smoke is visible from Challenger's right solid rocket booster just seconds after the boosters fired on Jan. 28, 1986.

AP Photo