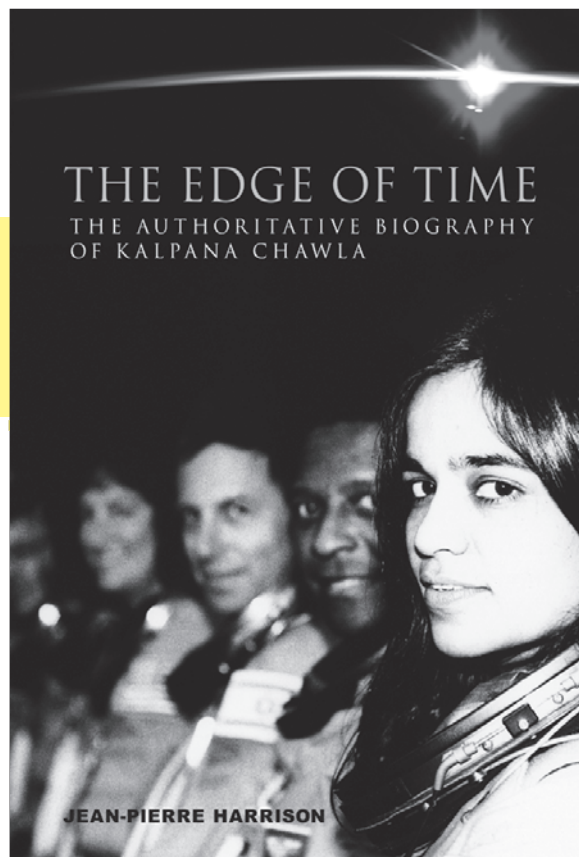


Biography of Kalpana Chawla



THE EDGE OF TIME: THE AUTHORITATIVE BIOGRAPHY OF KALPANA CHAWLA by Jean-Pierre Harrison, Harrison Publishing, Los Gatos, California-95033, USA (2011), \$5.99.

On 1 February 2003, NASA's space shuttle *Columbia* was destroyed during re-entry, killing all the seven crew members on board, including the Indian-born astronaut Kalpana Chawla. After her tragic death a few biographies of hers have been published. But, as Kalpana's husband and author Jean-Pierre Harrison says, the present volume gives the reader more detailed insight into her character than has heretofore been available, as he has "not cooperated with, contributed to, endorsed, or otherwise authorised any biography of Kalpana so far produced." And he may be right, for what the reader gets from this book may not be available from any other source – a first-hand account of Kalpana's adventure-filled life and her tragic death.

Born on 17 March 1962 in Karnal, Haryana, Kalpana was originally called "Montu" by the family. At the age of three she chose the name "Kalpana", meaning "imagination", as her formal name. She attended Tagore Bal Niketan School, and later Dayal Singh College and DAV College for Women, all in Karnal. Kalpana had decided on a career in aeronautical engineering at an early age, and joined Punjab Engineering College in Chandigarh

1984, and a PhD in aerospace engineering from the University of Colorado in 1988.

Harrison gives us a fair idea of the environment in which Kalpana grew up. Her family had to migrate from Pakistan after partition, but her father had no remorse. Rather he was an enterprising person and ventured into a variety of trades such as manufacture of steel chests, a cloth store, and a tyre factory, and his achievements "were substantial in their own right, without need for embellishment..." Kalpana's mother, though not as intellectually driven as her husband, understood Kalpana well and "encouraged her adventures, also participated when able..." Kalpana's oldest sister Sunita was a trailblazer in the family who insisted on choosing her husband rather than bowing to her father's wishes. Kalpana's other siblings were equally talented and this must have been an important factor in Kalpana's upbringing.

Kalpana's journey to the edge of time began with a small step – a flight over the plains of Haryana in a *Pushpak* aircraft as a young girl in the early 1970s. She still had a long way to go. After receiving her BSc degree in aeronautical engineering from

Punjab Engineering College, Kalpana was offered a position with the Hindustan Aeronautics Limited in Bangalore, but she turned down the offer and instead took up a position as lecturer at Punjab Engineering College. Meanwhile, she had applied for graduate aeronautical engineering programmes at Georgia Institute of Technology, Rensselaer Polytechnic Institute in New York, and the University of Texas at Arlington and had received acceptance from all the three. But she decided to join the University of Texas and arrived in Arlington in September 1982. Initially her father was not agreeable to let his daughter live alone in a strange country, but eventually agreed.

It was at Arlington that Harrington, who was a licensed pilot at that time, first met Kalpana. Soon they were seen frequently flying together in a light plane. They also went to several air shows in the area, which was a first for Kalpana. "As time progressed," says Harrington, "Kalpana and I found many common interests." Among the many interests Kalpana developed was that for SCUBA diving. Later, while attending the University of Colorado, she took lessons to become a stronger swimmer. After she was selected for astronaut training she took individual lessons several times a week and a SCUBA course to get basic diver certification.

The determination of Kalpana was evident from the fact that even after the tragic *Challenger* disaster in January 1986, she decided to apply for the NASA Astronaut Corps once she acquired US citizenship. After getting her PhD from the University of Colorado in 1988, she was offered a position as Research Scientist in the Computational Fluid Dynamics Group at NASA Ames Research Centre in Sunnyvale, California. She became a US citizen in April 1991.

The entire crew could not visit India, as relations between the United States and India had become strained after India's underground nuclear tests on 11 and 13 May 1998. Kalpana could not visit her native country in any official capacity because, as an astronaut, she was a representative of the US government.

In the summer of 1994, Kalpana received an interview call from Johnson Space Centre in Houston. She underwent thorough medical examinations, a psychological assessment, physical fitness evaluations, and a formal interview with a board of current, active astronauts. She was accepted into the NASA Astronaut Corps in December 1994.

Kalpana and her husband arrived in Houston, Texas in March 1995. Kalpana had to undergo rigorous training including learning to fly a supersonic jet trainer, parachute jump training, training in ejection seat operations, and a week-long survival course. She was trained in simulated microgravity operations at a large swimming pool described as a "neutral density tank". But despite all the training, Kalpana could not be considered for extra-vehicular activity in space because she was found to be "too small" for space suits meant for extra-vehicular activity, commonly known as 'spacewalk'.

In November 1996, Kalpana was selected for the STS 87 – the 24th flight of space shuttle *Columbia*, which carried a six-member crew. She was assigned the crew position of Mission Specialist 1 and backup Flight Engineer for ascent. Harrington says Kalpana "was happy to be assigned to any mission and trained professionally, ignoring annoyances and irritations."

As Kalpana was training for STS-87, she received a message from US Secretary of State Madeleine Albright to tape a video message to the Indian Parliament. But Kalpana was unwilling to accede to such a request because she wished to avoid any hint of involvement in politics. Ultimately, the STS-87 crew as a whole agreed to tape a short video for Albright's presentation, thus avoiding the possibility of any misuse of Kalpana's name.

Kalpana's family was at Houston on the occasion of the launch of STS-87. They stayed at a hotel about six kilometres away from Kennedy Space Centre. On 10 November 1997, the launch day, families of the STS-87 crew were hosted in the Kennedy Space Centre Launch Director's office from where they could watch the lift-off. *Columbia* lifted off at 2.46 p.m. local time. Eight minutes later, *Columbia* was in orbit. The crew released themselves from their seats and removed their orange pressure suits.

Once in orbit microgravity started having its effect on the crew. Kalpana noted that during her first day in orbit, "she constantly felt as if she were falling forward." She also had difficulty in falling asleep in the space shuttle's weightless environment. This is natural because in absence of gravitational cues the brain is unable to tell whether the body is lying down or standing up, which makes sleeping difficult.

During the flight the shuttle crew completed most of the assigned tasks except the deployment of the *Spartan* satellite. Kalpana was responsible for deploying the satellite from the payload bay with the remote manipulator arm. But because of software problems and failure of a second crewmember to adhere to the backup protocol, the satellite was not activated before it was deployed and later had to be retrieved from orbit.

Kalpana had the privilege of speaking with the then Indian Prime Minister I.K. Gujral from orbit. Gujral is said to have commented later that talking to Kalpana in orbit was for him the high point of 1997. The STS-87 mission ended with the safe landing of *Columbia* on 5 December 1997.

Tragically, although the entire crew of STS-87 wanted to visit India soon after the flight, they could not, as relations between the United States and India became strained after India's underground nuclear tests on 11 and 13 May 1998. Kalpana could not visit her native country in any official capacity because, as an astronaut, she was a representative of the US government.

Thirteen years later, when Kalpana was informed of her selection as a crewmember for STS-107 in the summer of 2000, she was overjoyed to be given the opportunity to fly in space again. She served as Flight Engineer and Mission Specialist for STS-107. Space shuttle *Columbia* was originally scheduled for launch on its 28th flight on 11 May 2000, but

various delays ultimately pushed the launch date to 16 January 2003.

The launch went off perfectly. Kalpana's family was in Houston to witness the launch. There were two video conferences while Kalpana was in orbit. "Kalpana demonstrated tumbles and caught floating treats with her mouth before eating them." The family enjoyed their daughter's antics and looked forward to seeing her home soon.

On 1 February, the day *Columbia* was to return home, Harrington was at the Shuttle Landing Facility viewing area at Kennedy Space Centre, eagerly awaiting Kalpana's return. But joy soon turned into apprehension, as repeated radio calls from the Mission Control to the shuttle crew went unanswered. Moreover, *Columbia* had not reported over Merritt Island adjacent to Kennedy Space Centre immediately before it was expected to land. It was clear that *Columbia* was not going to land at Kennedy Space Centre. Something was seriously wrong with the flight. But no one knew what it was.

Shortly thereafter, NASA Administrator Sean O'Keefe made the announcement, "This is the hardest thing I've ever had to do..." Soon, footage of *Columbia* breaking up in the sky was on every TV channel. Kalpana's family members were at Harrington's home in Houston, where they saw the accident on TV. In Kalpana's death certificate, the place of death was noted as "Airspace over Texas". She was dressed in a blue NASA flight suit before cremation.

The Edge of Time is a unique biography, lovingly done, by someone who has been witness to the finest moments in Kalpana's life. Written in a lucid style, without much hype, it presents great insights into the life of one of India's bravest women – her grit and determination. Her story is an example of the success that can be earned from hard work and persistence, and her life will certainly serve as an inspiration to Indian school children and youth, motivating them to take up new challenges in life.

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