

The Greatest Leap, part 4: Catching Apollo fever as a new NASA employee

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Video shot by Joshua Ballinger, edited and produced by Jing Niu and David Minick. [Click here for transcript.](#)

As inevitably happens in August, a sweltering heat with the tactility of dog's breath had come over Houston when Raja Chari reported to the Johnson Space Center. Just shy of his 40th birthday, the decorated combat veteran and test pilot had been born too late to see humans walking on the Moon. No matter, he was in awe of the new office.

Apollo: The Greatest Leap

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The son of an immigrant from India, Chari grew up in the heartland of America and grasped onto the American dream. He worked hard in school, and then in the Air Force, to become an astronaut. So when Chari finally got to Johnson Space Center in 2017 as a member of its newest astronaut class, his sense of achievement mingled with reverence. He found himself in the cradle of human spaceflight, where the Mercury 7 and Apollo astronauts had trained. Chari felt a wide-eyed wonderment for the people around him, too. The engineers. The flight controllers. His fellow astronauts.

“Honestly, it’s all about the people,” he told Ars just a few weeks after moving to Houston. “We’re all caught up in this sense of mission. The people here, my colleagues, are what really stand out. I can’t wait to go to work with them every day.”

Much, *so very much*, has changed in the half century since the astronauts walking the hallways of Johnson Space Center prepared for imminent Moon landings. But so strong were the aspirations of the Apollo era, and so meaningful their fulfillment, that a vestige of that period remains today at NASA. It’s this shared sense of purpose to explore, to go beyond. And after just a few days in Houston, Chari had become infected.

Thirty-nine-year-old NASA astronaut candidate Raja Chari waves

as he is introduced as one of 12 new candidates at NASA. Almost invariably during our reporting for *The Greatest Leap* series on the Apollo program's achievements, our older participants all remarked upon the wondrous experience of sharing their hopes, fears, and successes with hundreds of thousands of other Americans caught up in the race to the Moon. And similar to their present-day successors like Chari, these veterans of the Apollo program all initially got swept up in the grandeur of their work and its goals—the Apollo fever. They worked day and night in unusual and unanticipated circumstances, coming out on the other side to power one of humanity's greatest technological feats of the last century.

So today, these spaceflight pioneers look back and share a glimpse of that work-life experience back when JSC—and the Apollo program—were brand new.

“Male nonsense”

So many of the heroes of Apollo came from small towns. During the sleepy post-war years, Ivy Hooks grew up about an hour north of Houston, before the city's outsized suburbs had begun to encroach upon the Piney Woods. In Livingston, tearing around the countryside with four younger brothers, Hooks never really thought too much about rockets or space.

But she learned to love math in high school, and later, after she transferred to the University of Houston as a junior, Hooks found physics. She fell deeper in love with the subject that applied math to real-world problems. Hooks had the good fortune to graduate in the spring of 1963, just as NASA was in the midst of constructing the Manned Spacecraft Center (it would be named after President Lyndon B. Johnson in 1973) southeast of Houston. The growing agency needed thousands of talented scientists and engineers to bring Kennedy's Moon program to life.

Before the NASA opportunity, Hooks had interviewed for jobs in

the region's main industry—oil and gas extraction. Despite her degree in mathematics, these companies just wanted her for secretarial jobs. NASA, however, desperately needed talent, regardless of gender, and Hooks had experience in both math and physics. “When I came to NASA, a lot of people with math degrees were treated like computers that everyone is now familiar with from the movie [*Hidden Figures*],” she said. “But because I had physics, too, I ended up as an aerospace technologist like all of the engineers were.”

Soon, she put that experience to work on various projects. For example, some engineers in her department were struggling to work out what lighting conditions astronauts could expect on the surface of the Moon as they descended in the lunar module. Hooks hadn't particularly excelled in the heat, light, and optics physics class she had taken, but she had passed. And that was more physics than the engineers had, so she took up the task. Her first step was to see if anything had been written about lunar albedos, and so she visited the “library” in her department.

- An aerial view of the site of the Manned Spacecraft Center in late 1961, after land clearing but before construction began. This gallery shows the growth of the center.
- A photograph of Site 1 at the Manned Spacecraft Center, in Clear Lake, prior to start of construction.
- Before there were astronauts, cows grazed on site in Clear Lake.
- Construction of the Project Management facility, Building 2, at the Manned Spacecraft Center. The building's numerical designation was changed to Building 1 on June 28, 1974, and the center's name became the Johnson Space Center.
- An aerial view of the Manned Spacecraft Center in 1963, shortly after it opened for business.
- A view of the “fish pond” in the heart of the space

- center, in 1965. These trees provide ample shade today.
- An aerial view of Johnson Space Center two years after it opened, in 1965.
 - Finally, the modern view of Johnson Space Center, as seen in 2008 when Space Shuttle Endeavour circles over.
 - Aerial Photography of Johnson Space Center site and facilities in 2014.

Although a few buildings of the new NASA center opened for business in September 1963, most employees remained scattered in temporary offices across the city for a time. Hooks' engineering department was housed in an apartment building in southeast Houston, on Telephone Road, which would later become memorialized in songs by Steve Earle and Rodney Crowell for its wild reputation. NASA had moved into the apartment building before it was finished, but that suited Hooks because it had bathrooms everywhere. The library she sought was located in a one-bedroom apartment with just carts of books. Eventually, Hooks found some Russian materials from the 1920s that, in pure mathematics, described the albedo of the Moon. From this, she derived equations to use in the lunar landing simulator.

By and large, the Apollo programs at this time remained bastions of masculinity. To thrive, Hooks had to prove her professional skills and have a thick skin. "I had some of the worst treatment I ever had that first year," Hooks recalled. "In today's day and age they'd probably all be in jail or something, or probably at least gotten fired. That wasn't going to happen then. But you have to understand, I grew up with four younger brothers. I can put up with just about any male nonsense."

She proved that one day after lunch. The men would leave off work for about an hour and a half, but they'd tell Hooks she could only take 30 minutes. One day, after one of these quick lunches, she went into a drafting room with some graphing paper and sat up on a high stool at a drafting board. A little

later, she looked out the window and noticed a bunch of people standing on balconies, overlooking the pool at the center of the apartment complex. They were looking at a snake or something in the water, Hooks realized, and she went back to her work shaking her head at the nonsense.

"I'm working on something intently," she recalled. "I'm in one of those modes where I'm not aware that there is anyone around." Then, she heard a noise and looked up. About 10 men had crowded behind her, and another 10 had moved in around the sides of the room. Something was up.

"So I look around, and up on top of the big drafting board they've got a big piece of computer paper," Hooks recalled. "When they yank it off there's a little garter snake, or a garden snake, but definitely not venomous. I guess they were waiting for me to scream, or jump up, or do something. So I just reached over and picked it up and turned around to the guys behind me and said, 'Go play somewhere else.' That probably did more for my NASA career than any work I ever did."

Listing image by NASA / Aurich Lawson

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