

## KEITH A. COMEAUX, PHD



**Keith A. Comeaux** joined NASA's Jet Propulsion Laboratory in 2006 to lead Curiosity's entry, descent and landing validation effort. As Curiosity's design neared completion and construction began, Keith transitioned to the assembly, integration and test team as the deputy systems manager. There he was responsible for leading the Curiosity's system test activities during its construction and test at JPL, as well as during the launch campaign at Cape Canaveral in November 2011.

Following the launch, Keith served as the cruise engineering operations team chief. In this role, he led the engineering team responsible for operating Curiosity during its eight and a half month cruise and approach to Mars, culminating

with its landing on the night of Aug. 5, 2012, with Keith serving as flight director. After landing, he was one of several tactical mission managers responsible for the initial commissioning and operation of Curiosity as it began its journey of discovery on the Martian surface. Keith received NASA's Exceptional Achievement Medal and several group achievement awards for his contributions to the success of Curiosity's mission.

Keith was most recently the deputy integration & test manager for JPL's SMAP (Soil Moisture Active Passive) Mission. SMAP launched from Vandenberg AFB on Jan. 31, 2015, and is now producing soil moisture maps for use by scientists to improve our understanding of the Earth's climate. Before arriving at JPL, Keith worked for Boeing's Satellite Development Center (formerly Hughes Space & Communications) for 11 years in varying roles of increasing responsibility. While at Boeing, he completed Boeing's Engineering

Leadership Program and received the AIAA Lawrence Sperry Award, which recognizes contributions made by aerospace professionals early in their careers. Keith graduated from LSU in Mechanical Engineering and Physics and completed Masters and Ph.D. degrees in Aeronautics and Astronautics at Stanford University, where his research focused on hypersonic aerothermodynamics and computational fluid dynamics. He also completed his MBA at UCLA. Keith and his wife, Cecilia, and their children, Evie and Max, live in Redondo Beach, California.

When I look back on my youth, education and career, the common thread evident throughout is my curiosity. As a child, I was fascinated with all manner of aircraft, rockets, and spaceships. I was a bit young to remember the moon landings themselves, but I do remember pretending that my little red wagon was a space capsule. On Saturday evenings when my parents were away at Tiger Stadium, my grandfather would pull me in my capsule from the back door of the house around to the front stoop to watch the street lights come on and the stars come out. My grandmother would tell me that I'd grow up to live on the moon one day.

As Apollo waned and the Space Shuttle program delayed during the seventies, my attention turned to airplanes. I was enthralled by TV shows and movies that depicted daring pilots and their exploits: "Midway", "Black Sheep

Squadron", "Battlestar Galactica", and yes, "Star Trek" and "Star Wars". My parents encouraged my interest by introducing me to model airplanes and other science related "toys" at Christmas: a telescope, a microscope, a chemistry set, an electronics set, an optical kit, among others. Summer vacations included visits to the Pensacola Naval Air Station as well as Johnson Space Center in Houston. By the time I was in high school, I put it all together—good in math, interested in science, loved airplanes—I was going to be an aerospace engineer and perhaps a fighter pilot or astronaut.

As I was finishing high school, I had several options to choose from for college. But having grown up in Baton Rouge and gone to many football and basketball games, the draw to LSU was inescapable. An LSU Alumni Scholarship sealed the deal. While LSU graduated Max Faget and Walt Williams, both giants in the world of NASA, as

well as honored members of this Hall of Distinction, LSU no longer had an aerospace engineering department. No matter, I'd make the best of it. I decided to double major in ME, the broadest of the engineering disciplines, and Physics, the most foundational of the sciences. Both would be invaluable to me as I pursued my chosen profession. The focus on aerospace could wait until graduate school.

I had the good fortune to have Dr. Robert Courter as one of my professors, advisors and mentors. An aerospace engineer himself, he helped me navigate the demanding ME curriculum. I took every one of his electives: aerodynamics, orbital mechanics and gas dynamics. Some of my classmates took to calling me "Keith Courter," not only due to my affinity for Bob's classes and our participation in the AIAA student chapter, but also due to our similarity in stature and appearance. Unfortunately, my vision was not up to the standards of the day to pursue my desire to be a fighter pilot. As I began thinking more about my future in aerospace, hypersonic

aerodynamics captured my attention. This was the technology that enabled planes to go faster than fast. It was the key for the next generation of airplanes that would fly from New York to Tokyo in two hours and enable reusable space planes to dramatically lower the cost of reaching earth's orbit. Dr. Courter guided me to Stanford for graduate school with its close affiliation with NASA Ames, one of the premier research facilities in the world for high speed flight.

Hypersonic air-breathing rocket plane projects were already on the drawing boards by the time I entered graduate school. As I completed my coursework and began my research, I landed a student office space at NASA Ames and rubbed elbows with some of the smartest and most experienced engineers in the field. But as I neared graduation, the momentum had shifted. Hypersonic projects were being cancelled, and new jobs in my narrow specialty were rather hard to come by.

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I found myself interviewing with Hughes Aircraft, which no longer actually built aircraft but rather satellites in the Los Angeles area. It seemed interesting, but I knew very little about building satellites. When I visited the facility for a second interview, I learned that four of its employees had been selected to train as NASA payload specialists and one of them was on my interview schedule. He informed me about a new satellite under development that would employ ion propulsion, the stuff of science fiction. When I saw the various satellites under construction in the factory, I was hooked. I jumped in with both feet and drew upon the foundational knowledge that I had gained at LSU. It was difficult shifting gears, but I eventually got my bearings. Four years later we were flying the world's largest, most powerful telecommunications satellites, using ion propulsion to do it, and selling new satellites to the likes of DirecTV, XM Radio and the Air Force. And I even found my wife

Cecilia, another Hughes employee, when we both answered a call to mentor high school students in the Los Angeles area. Our journey together since then has been filled with many wonderful experiences and blessings.

While still at Hughes, now part of Boeing, I received a call from a former colleague who had previously left for JPL and worked on the Spirit and Opportunity Rovers. There was an opening that I was almost perfectly suited for, given my rather diverse experience in mechanical engineering, physics, aerospace, hypersonics, satellite engineering, integration, test, mission operations and project management. I was invited to help land a one ton rover on Mars with this crazy new strategy called Sky Crane. Happy at Boeing and doing well, I had just enrolled at UCLA to earn an Executive MBA. It was a difficult decision to leave, but at the end of the day, landing a Rover on Mars

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was simply an offer I couldn't refuse. Six very challenging years later, including the birth of our twins Max and Evie, my inner Tiger roared in jubilant celebration as Curiosity gently touched down on the surface of Mars. To this day, Max and Evie still search for their Dad in any image of a mission control room.

One of the most significant privileges I've received for having been a part of Curiosity's success is the opportunity to share the excitement and enthusiasm of our mission with not only the public but also the next generation of engineers and scientists. Kids of all ages are inspired and motivated by Curiosity's success to pursue interests in science, technology, engineering and math. When I was at LSU, landing rovers on another planet was not even conceivable to me. Kids today will one day help shape our future in ways that we cannot yet imagine. I am humbled to know that I may have a small part in nudging a few of them in that direction. And the advice I share based on my own experience is this: Shoot for the stars, but ALWAYS

follow your curiosity. If you get lucky, instead of a star, you may land on Mars. Geaux Curiosity! Geaux Tigers!!