

Rob Manning

Chief Engineer at NASA Jet Propulsion Laboratory

Summary

I have been working space missions at JPL since I arrived in the early 1980s right out of Caltech. After a decade or so building spacecraft avionics and software, I transitioned to guidance and control and systems design of interplanetary missions. My "lucky break" occurred when Brian Muirhead hired me as Chief Engineer for Mars Pathfinder in the early 1990s. Soon I took a big left turn and volunteered to lead Pathfinder's Entry Descent and Landing (EDL) team. From then on, I was hooked. The Mars EDL problem was so hard and required so many disciplines and human talent that I found it to be the best engineering problem I could find in my career. I also found Mars exploration itself to be very exciting. From then on I have been deeply involved in the technical design of nearly every US Mars mission that has occurred during the Mars Renaissance of the past 20 years.

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Chief Engineer

April 2018 – Present 1 year 2 months

Pasadena CA

Additional duty to ESD Chief Engineer

- *JPL Engineering and Science Directorate Chief Engineer*

October 2016 – Present 2 years 8 months

Pasadena

- *Mars Engineering Manager*

January 2013 – October 2016 3 years 10 months

Pasadena

In parallel with my work on LDSD, I lead a small team within the Mars Program Office that works with all of the Mars missions to ensure that they stay connected with each other. I also work with advanced programs and NASA headquarters to ensure that new requirements for future missions can be met.

- *Low Density Supersonic Decelerator (LDS) Project Chief Engineer*

August 2012 – April 2016 3 years 9 months

Pasadena

As of September, in addition to my duties for the Mars Program office, I have returned to my former life as an EDLer. I am now the Chief Engineer for the Low Density Supersonic Decelerator (LSD) Project. This is a project to develop new (and very cool) supersonic decelerator technologies that we hope to use on future Mars missions. These are specifically designed to help us push the mass envelope for missions that need to land landers or rovers on Mars that are heavier than about 1000 kg. Despite our success landing a 900 kg rover in August 2012, we still really do not have the tools to land something even as large as 1200 kg (unless we restrict landing to the lowest places on Mars). This project is developing new supersonic parachutes (specifically a disk-sail) as well as two types of SIAD (Supersonic Inflatable Decelerator). This project will culminate in a set of flight tests off the coast of Kawaii HA in the next 2 years.

- *Mars Science Lab Chief Engineer*

2007 – August 2013 6 years

As Chief Engineer for the Mars Science Laboratory (MSL) Project that landed Curiosity Rover on Mars on August 5, 2012, I was responsible for ensuring that the design, the test program and the team would result in a mission that would work. During development, the Chief Engineer's job is to make sure that the architecture of the spacecraft and the surrounding people and infrastructure will do the job. As new problems pop up that cross team and subsystem boundaries, the Chief Engineer pulls together problem failure or problem recovery teams (we call them "Tiger Teams") that have the wheel base to make changes to get the project back on course.

- *Mars Program Chief Engineer*

October 2004 – December 2007 3 years 3 months

Pasadena, CA

This was a very unusual job where I had to make sure that the multiple Mars missions in development and in operations would technically work together and that we had a roadmap that would allow NASA to deliver even better science (like the 1 ton Curiosity Rover) and even land humans on the surface of Mars some day.

For example with Mars Reconnaissance Orbiter (MRO) in Mars orbit, for the first time in history we had the capability to actually photograph a lander as it descended on its parachute. With Phoenix lander landing in 2007 with the same overall parachute design as the planned MSL parachute, I argued that in the event of a (hopefully unlikely) EDL

failure we might be able to eliminate the parachute as a root cause. So the talented MRO team at LMA took the image and made history.

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Mars Rover book author

Mars Rover Curiosity: An Inside Account from Curiosity's Chief Engineer
October 2014 – March 2015 6 months

This past year, with NY Times best-selling author Bill Simon, I wrote a book about our team's engineering exploits developing Mars Science Laboratory and its Curiosity Rover. It was published by Smithsonian Books and is now in book stores near you.

See <http://www.amazon.com/Mars-Rover-Curiosity-Curiositys-Engineer/dp/1588344738>

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JPL (NASA's Jet Propulsion Laboratory)
3 years 11 months

- ***Mars Exploration Rover (MER) Entry Descent and Landing (EDL) Lead***

April 2000 – February 2004 3 years 11 months

Pasadena, CA

As EDL lead, I led the team responsible for the design, test and operation of MER's EDL phase. This is the phase of the mission transitions MER from an interplanetary traveler to a surface rover.

- ***Mars Exploration Rover (MER) Systems Engineering Manager***

April 2000 – June 2003 3 years 3 months

Pasadena CA

As MER Systems Engineering manager, I managed and led the systems team responsible for the overall system design and system test of MER flight system including the cruise stage, aeroshell and rover.

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[JPL \(NASA's Jet Propulsion Laboratory\)](#)
[2 years 2 months](#)

- ***Mars Sample Return (MSR) '03/'05 Lander Manager***

January 1998 – February 2000 2 years 2 months

Pasadena, CA

I led a small team (mostly at LMA in Denver) to design a large lander that would deliver a large sampling rover (the Athena Rover), a Mars Ascent Vehicle (MAV) and a surface sampling payload. This very difficult mission was cancelled not long after the loss of Mars Polar Lander.

- ***Mars Surveyor Program Chief Engineer***

January 1998 – December 1998 1 year

Pasadena

Engineered a plan to ultimately bring Mars samples back to Earth in a series of smaller missions.

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Mars Pathfinder Chief Engineer

JPL (NASA's Jet Propulsion Laboratory)

March 1993 – September 1997 4 years 7 months

Pasadena CA

Worked within a very small, dedicated and collocated team to put Mars Pathfinder and its payload including Sojourner rover on Mars in a "Faster Better Cheaper" (skunk works) mode.