NASA-JPL director Charles Elachi talks about latest Mars mission

Massachusetts Institute of Technology

The car-sized Mars rover Curiosity, which landed on the Red Planet last month, is the biggest, most expensive and most ambitious planetary mission in many years. But it is just one of a sweeping portfolio of past and future missions of pioneering planetary exploration managed by NASA's Jet Propulsion Laboratory (JPL) in Pasadena, Calif., as JPL director Charles Elachi described in a talk at MIT on Monday.

"Mars is only about 15 percent of what we do," Elachi said, although it's the project that has been garnering the lion's share of attention this year — including a congratulatory phone call from President Barack Obama after the successful conclusion of Curiosity's "seven minutes of terror" landing sequence. That landing used several innovative technologies, including a "sky crane" that gently lowered the rover to the Martian surface — all of which had to work perfectly for the landing to succeed.

Curiosity's 350-million-mile trek from Earth to Mars, and its need to land within a designated two-mile-wide area, was comparable to hitting a golf ball in Cambridge and having it land on a specific seat in Pasadena's Rose Bowl Stadium, Elachi said — and doing so while the stadium was moving rapidly.

The team that accomplished this feat and monitored its progress from JPL's mission control center included at least six MIT alumni, Elachi said — including the instant celebrity known as "Mohawk Guy," Bobak Ferdowsi SM '03. (Ferdowsi now shaves different patterns on the sides of his head each week in response to public requests, Elachi said, showing a photo of one pattern he had adopted, which spelled out "JPL" in Morse code).

Elachi hopes that many more MIT graduates will end up working at JPL. "We need talent, from materials scientists to biologists to electrical engineers," he said.

The latest images beamed back by Curiosity, like the many images of Mars from earlier landers and rovers, reveal a surprisingly Earth-like landscape, Elachi said. In fact, in classes he teaches at Caltech — a sidebar to his duties as director of JPL — he often shows students side-by-side images from Mars and Death Valley. The pictures appear so similar, he says, that he sometimes forgets the correct identification himself.

"Could life have developed on Mars?" Elachi asked. It seems entirely possible, he said: "We believe that there were oceans" on the Red Planet in the distant past — the kind of environment where life is believed to have originated on Earth. Even today, images from orbit have given indications of a subsurface layer of flowing water that sometimes spills out on crater and valley walls. Perhaps signs of life will be found there, Elachi said, if and when our robotic emissaries are able to drill down

into the Martian subsurface.

Elachi says that beyond Curiosity's mission, which is expected to continue for at least six years, further missions will be sent to Mars in 2016, and possibly in 2018 as well. Eventually, researchers hope to send a mission capable of returning samples from Mars for more detailed analysis on Earth, he said — after careful precautions, including a layover at the International Space Station to guard against dangerous contaminants.

Mars missions, as exciting as they are, represent only a small part of JPL's work, Elachi said. The ongoing Cassini mission exploring Saturn and its moons; the upcoming Juno mission to Jupiter; the Dawn mission exploring the solar system's largest asteroids; and continuing communication with far-off Voyager 2, in the outer fringes of the solar system, are among the many other missions managed by the lab.

Running such a far-flung armada of planetary exploration craft is far from anything Elachi ever imagined growing up in a small village in Lebanon, he said. But he has now spent more than 40 years at JPL, he said, and "it's really the most exciting thing. I get paid for doing exploration."

The white-knuckle landing of Curiosity on Aug. 5 — where, Elachi said, "if any one thing doesn't go right, it's game over" — was watched live by an estimated 50 million people, despite taking place at 1:30 a.m. Eastern time.

"We put our footprint on that planet with our rovers," he said. Knowing that our robotic emissaries are exploring Mars' nooks and crannies, he said, the Red Planet "looks different now." It's no longer just a pinpoint of distant light, it's a very real outpost of human exploration.

Source URL (retrieved on *05/24/2013 - 2:23pm*):
http://www.ecnmag.com/news/2012/09/nasa-jpl-director-charles-elachi-talks-about-latest-mars-mission