



Robots control on Mars - Richard Kornfeld

In Pasadena a pleasant suburb of Los Angeles, Richard Kornfeld has been working over the past six years in the Jet Propulsion Laboratory, one of NASA's research centers. The 39 year old engineer from Zurich co-manages the mission to the red planet in 2007.

Olivier Dessibourg, Pasadena. Traduction: Sylvia Hottinger

"When I saw the Sojourner robot on Mars being piloted by a technician, I said to myself this is what I want to do. At that moment, the JPL was entering into my radar zone!" That was in 1997. Ten years later, Richard Kornfeld, an occasional private pilot, reached his target on the monitoring screen of his career. For six years now this 39 year old man from Zurich has been working on Martian missions at the Jet Propulsion Laboratory (JPL), one of NASA's research centers. This Holy of holiest of robot exploration of the solar system is coiled up in the hills of Pasadena, a pleasant suburb of the mega city of Los Angeles. A sanctuary of sciences which is no open house as strategic security obliges, one can only get in after a series of strict ID controls. In the midst of non descriptive buildings a verdant space spreads out, a mixture of fountains and terraces with teak furniture where deers sometimes venture. Richard Kornfeld with a mischievous smile joins us at a lively step.

In the Museum that shelters the models of NASA's space engines, our visit takes place at that same lively pace. In front of every object, the Swiss engineer's exhaustive explanations reveal a passion and a fascination that one feels are inexhaustible. "It's difficult to find a place on earth that hasn't been explored. On the other hand, space missions have provided us with brand new images. I'm fascinated by the exploring side of it."

In another building, another décor: a surface is covered in reddish sand, is inclined in different places so as to better reproduce Mars' floor. In the middle there are the exact copies of the Opportunity and Spirit robots, which are awkwardly crawling on the red planet. "This is where we test our machines and simulate breakdowns so we can fix them, he explains. In fact, this tray constitutes a privileged playground."

Behind his thoughtful demeanor and his calm blue eyes, Richard Kornfeld has maintained the creativity and playfulness of a child handling his first mechanical toy. That same inventiveness which, when he discovered the exploits of man on the Moon on tv, made him tinker with rockets in the family garden in Zurich. He laughs: "My mother would go to the chemist to buy the necessary chemical fuels. But most of my prototypes would explode..."

But no matter. Like at present, the teenager already knew what he wanted. "I wanted to study aeronautics but at that time there was no department in Switzerland. So I decided to become an electrical engineer at the Swiss federal institute of technology of Zurich". Was it a sign of destiny? His dream was fulfilled on the wake of a plane, the famous F/A-18: "When, in 1994, Switzerland bought 34 of its attack aircrafts in the US, the deal had some trade offs. Among them, their builder Mc Donnell-Douglas had to hire and train ten Swiss engineers". That's how Richard Kornfeld came to St-Louis, Missouri.

The experience was a success. And the engineer agreed to extend his contract for a few months. But he also wanted to put his newly acquired knowledge within the framework of a diploma. Audacious and determined, he chanced the prestigious Massachusetts Institute of Technology that offered a post-grad course in aero and astronautics. Since the beginning his mentor warned him that he only had two years of financial back up. "The pressure was on", he remembers, still baffled. But he is fast in concluding: "Except for a few real geniuses, most people there had a normal intelligence but they were hard working. So I got down to it."

Richard Kornfeld compelled himself daily to stay focused on his Ph.D, in fact to go down a road as directly as possible is one of his natural personality traits: "I was 29 years old, and I was about to get married. So I told myself I'd better do it fast..." Fast was three years and half. Any memory of that period ending in 1999? "The sharpness of my colleagues' minds. Among themselves they discussed matters in a very rational way. You know I also have a very Cartesian side..." A confidence that is evident as the conversation progresses.

From then on the engineer held all the necessary tools to mould his ambition. For if doing some of your studies in the US is a conventional step in a young scientist's career, to hoist oneself into NASA is noteworthy. Thus Richard Kornfeld entered the den of Martian robots, the JPL, even tough he was Swiss. "It's the California Institute of Technology, a private university that manages the lab for NASA. It is therefore allowed to employ certain foreign scientists who have the benefit of a green card."

Richard Kornfeld took part in the development of different missions, some of these were to Mars. Among them, the apotheosis, the arrival to destination of the two "rovers" in January 2004. After that he co-managed the remote control. "With my wife, we refer to it as the "day of the two landings"". On the same evening Spirit landed, Esther gave birth to their second son Leon. That was enough to add even more excitement to already

euphoric days...

To the great astonishment of its creators, Spirit and Opportunity are still happily roaming around. Richard Kornfeld is too, but taking a new course. "In these kind of missions, once the robots are put into action, a certain number of engineers are quickly assigned to other projects. Sometimes we must be flexible." When this is the case for him, his pragmatism and appetite for discovery make him turn the page. Overmore, his eye for detail "typically Swiss", his dynamism and his sense of responsibility are acknowledged by JPL, and so much so that he is at present the Deputy Project Systems Engineer of the next mission to Mars, the Phoenix Mars Lander.

And what does this position entail? "This robot with no wheels will land in 2008 on Mars' north Pole to dig and analyze the water hidden under the surface, most probably in the form of ice. It's a real small chemist's lab. I'm in charge of making sure that all the elements of the project (from the engine to the scientific tools including the control systems) work well as a whole." Quite a big responsibility. "Well. I'm "only" the deputy, he adds laughingly. On a more serious note: it is true that the fact of being young is not a disadvantage here. Also, all projects are openly discussed and by whoever wants to in JPL." It's a way of minimizing jarring notes, frank but honest, and much to the engineer's taste. At a time when Europe is also developing a robot for Mars (ExoMars) does our Swiss engineer feel the need to rally to the Old Continent? Even more so since he misses not seeing his Swiss friends more often. "I don't exclude the possibility. But at the moment I feel at home here," in this cozy and friendly quarter of Pasadena where his two children are growing up. And also two years ago, Richard Kornfeld has become a US citizen.

With regards to his career he considers it to be one of privilege - "my excellent Swiss education has a lot to do with it"- this man refuses to throw a definite plan against his rocket. Overmore this enthusiast of landscape photography, of mountain walks and diving would like to enter another field, that of inner land exploration. On Earth first - "our exobiology group often goes to far away places like the arctic to simulate experiments; I'd like to take part in that"-, and perhaps even in space. And from higher up, who knows? Asking him that question is answering it: he'd have no doubts in signing up immediately to become part of the first human expedition to the red planet.

"I read the Swiss press daily"

"Thomy", cheese and the Tages-Anzeiger paper are his links with his country.

Ask Richard Kornfeld to evoke his ties to Switzerland and it's his wife Esther who laughingly cuts in: "Thomy!" "Every time we go back to Switzerland to visit our families we bring back our stock of mayonnaise..." Another of our agricultural products that makes the couple's mouth water is the cheese from our Alps. Oh, one can find pieces of Appenzeller cheese in the local supermarket but at the price of gold.

Neither mayonnaise or gruyere cheese transit through Internet, the Kornfelds use this media to devour something else: the Swiss press. "I read the Tages-Anzeiger everyday", he says. She says: And I, Facts". "I like to keep in touch with the fish pond in which I was brought up, my town Zürich, And I do it in German with pleasure" the engineer explains. Which news item has he recently read that left an impression? "Doris Leuthard's election to the Federal Council. She's a very friendly person. And Swiss politics in general, I enjoy being able to get a general picture at a distance..."

Express bio

1967: Born in Zurich.

1989-1994: Electrical Engineer Diploma from EPF in Zurich.

1994-1995: Work-experience at McDonnell Douglas in St. Louis, Missouri.

1996-1999: PhD in aero-and astronautics at the Massachusetts Institute of Technology, Cambridge.

1997: Married Esther.

Since 1999: NASA/Caltech Jet Propulsion Laboratory Engineer.

2001: Birth of first son, Aaron.

2003-2004: Participated in Mars Exploration Rover mission (Spirit and Opportunity robots).

2004: Birth of Leon, the night Spirit landed on Mars.

2005-2006: Participation in Phoenix Mars Lander 2007 project.

