

Library - Book Review

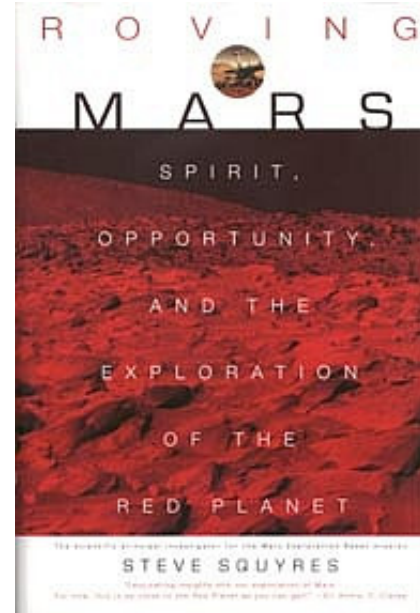
Roving Mars - Spirit, Opportunity, and the Exploration of the Red Planet

by Steve Squyres
Published by Hyperion, 2005
422 pp, hard cover.

Reviewed by: Tim Napier-Munn

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Great literature this is not, but it is a tremendous story told in an immediate, almost breathless colloquial style. If you like knowing how space science is actually done - the politics, the human drama, the money (lots of it), and above all the technology - then this book is for you. It's a rollicking good insider's story, with triumphs, disasters, good guys and a few bad guys. Author Steve Squyres, who gave a superb presentation at the Brisbane Planetarium in August 2005 to promote the book, is the Principal Investigator (essentially the Chief Scientist) for the NASA Mars Exploration Rover mission (MER). He was involved from the beginning in the planning and execution of one of NASA's most successful planetary missions - the design, construction, landing and operation of the extraordinarily effective Spirit and Opportunity rovers, which touched down on opposite sides of the red planet in January 2004 with the main objective of looking for evidence of water in Mars' geological past.



Trained as a geologist, Squyres is now a professor of astronomy at Cornell University and by his own admission has been in love with Mars for most of his life. He has an anthropomorphic fondness for the rovers, and why wouldn't he - 18 years of his life (so far) have been bound up in the MER mission and its precursors. One of the great features of the book is its exposé of the brutally competitive way in which big science projects are conceived, planned and, as often as not, abandoned in the demanding process of peer review and the associated financial and political machinations. Squyres endured many disappointments before his concept was accepted and funded. But he would probably be the first to admit that this gave him the resilience and experience to produce a better plan and then manage the setbacks and downright disasters that are part of getting a stupendously difficult project onto the surface of another planet and then doing great science.

Squyres covers all aspects of the process – the kernel of the idea (he and colleagues were given a modest sum by NASA in 1987 to build a panoramic camera that could go to Mars, which survived in advanced form on Spirit and Opportunity), the many failed attempts to get a mission approved by NASA, the refinement of the plan, the science concepts and the instrumentation package that is the heart of the mission, the massive engineering effort to design and build the hardware, project management on a gargantuan scale, the rocket science (literally !) and the drama of launch and successful landing on the red planet seven months later.

There are many great moments in the book. For me, one was the brilliant idea of NASA's Administrator Dan Goldin, no less, quite late in the piece to send not one but two rovers in a return to the well proven NASA principle of redundancy. Squyres and his team were suddenly overwhelmed with an embarrassment of riches and a challenge to which they rose magnificently. Another extraordinary moment was the landing of Opportunity in a small crater with unequivocal evidence of rock bedding visible in the very first view the camera gave the team on Earth – what Squyres calls

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a “300 million mile interplanetary hole in one”. There are also some superb colour pictures which record the building of the rovers and the sights they saw in the early days on Mars.

MER has been, and continues to be at the time of writing (October 2005), a spectacular success. Mars has been the graveyard of the majority of orbiting and lander missions sent to it over the decades, and Squyres reviews some of those. MER has not only achieved all of its science objectives but much, much more. Most significantly the rovers have already lasted more than seven times longer than the admittedly conservative original 90-day plan, and have been able to travel much further than the original target of 600m (at the time of writing Opportunity had motored over 6km). The impact on the science results has been tremendous, and the case for the presence of water in Mars’ past is now beyond dispute. The rovers have detected rock structures, textures and mineralogy that could only have formed in and around water. (For the latest news, visit <http://marsrovers.jpl.nasa.gov/home/>).

Squyres includes 28 pages of no less than 4,000 names of all those who contributed to the MER project. It must have taken considerable powers of persuasion to get the publishers to pay for essentially unproductive space, but it is a measure of Squyres’ commitment as a team player and his respect for the many people who contributed to the project. Indeed the book is a testament to the teamwork needed to bring such a mission to fruition, and Squyres gives full credit to all of his colleagues, even those who didn’t always agree with him. One of his interesting topics is the eternal conflict between the visionary scientist, who wants to change the world, and the practical engineer, who has to get the thing to work. It reminded me strongly of Chaisson’s 1994 book “The Hubble Wars” which was dominated by the issue. It’s a very human story.

If you are, like me, a sucker for astronomy, space flight and the drama of how science and technology projects are actually done, then it is difficult to fault Squyres’ knowledgeable and passionate treatment of his subject. A chronology of the complicated story would have been helpful, but that’s just quibbling. It’s a great read.