Nick Kanas

# The New Martians

## A Scientific Novel

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- Consciousness and mind manipulation

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*Cover illustration:* The map of Mars shown on the cover is from the 1909 edition of Percival Lowell's *Mars as the Abode of Life*. Since this drawing was made from telescope images, south is up. The double-pointed purple albedo feature pointing downward in the upper center was called *Sinus Meridiani* since it was located on the Martian Prime Meridian at 0 degrees longitude. The region is now called *Terra Meridiani*, the area where the crewmembers mentioned in this novel had their base. Note the prominent system of canals, some of which are in doubles. The first astronauts who land on Mars will not find any canals, which have been shown to be optical illusions. Courtesy of the Nick and Carolynn Kanas Collection; and *Solar System Maps: From Antiquity to the Space Age*, Nick Kanas, Springer/Praxis, 2013.

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# Preface

Current planning for a manned expedition to Mars envisions a total mission duration of 2½ years and a crew size of six or seven people [1]. Such an expedition might reasonably occur in the mid-2030s, when Earth and Mars will be optimally aligned so as to minimize travel time and energy needs. Given the high cost of transporting and landing people on the Red Planet, the mission likely will be multinational and will involve an international crew of men and women who are highly trained and selected to form a cohesive group.

Since much of the mission will take place in an isolated and confined vehicle traveling in deep space under conditions of high radiation and microgravity, there will be three potential "show-stoppers" that will impact on the crew (excluding accidents and the possibility of a micrometeoroid collision): high radiation, which can be minimized by proper shielding of the space vehicle; microgravity, which can be minimized by a strict exercise regime to stimulate and tone bone and muscle; and the effects of isolation and confinement on crewmember psychology and interpersonal interactions, which will be the subject of this book.

*The New Martians* is first and foremost a science fiction novel. It is a tale of the first crew sent to Mars, whose mission goals are to explore the planetary surface and to search for evidence of life. The story takes place during the return phase of the mission, when the crew is confronted with a series of life-threatening events. The novel explores real psychological and interpersonal issues that could affect such a crew and is told from multiple points of view that attempt to penetrate the thoughts and feelings of the expedition participants.

As suggested by the subtitle of this book, *A Scientific Novel*, the story will be followed by an appendix that reviews the science behind the story. The results from actual psychological and interpersonal studies of people living and working on-orbit will be summarized and linked to specific events in the novel. This addition is one of the unique features of the science fiction stories that are part of the new "Science and Fiction" series being introduced by Springer Publications.

In writing *The New Martians*, I want to thank a number of individuals whose help and influence contributed to its final publication. First and

foremost are the staff at Springer Publications, especially Dr. Harry Blom and Maury Solomon, who published the textbook I co-wrote with Dr. Dietrich Manzey entitled *Space Psychology and Psychiatry*. Harry put me in touch with Clive Horwood, the respected publisher of Praxis Publications, who in turn produced my two celestial cartography books under the Springer/Praxis label: *Star Maps: History, Artistry and Cartography,* and *Solar System Maps: From Antiquity to the Space Age*. Clive in turn put me in contact with Dr. Christian Caron, the editor of Springer's Science and Fiction series, and he selected my novel as the first work of fiction in this exciting new series. I am grateful to Chris for his helpful comments on an earlier draft of this novel, along with the comments made by Dr. Dirk Schulze-Makuch, who is on the series' editorial board. I am also grateful for the useful comments made to an earlier draft of this book by a number of friends and colleagues: Drs. Oliver Angerer, Craig Kundrot, Lyn Motai, Steve Vander Ark, and Walter Sipes. Kudos also to members of my science fiction book club who read the draft and made helpful comments: Diane Caradeuc, Ruth Corwin, Dr. Shirly Huang, Susan Kern, Brenda Paske, and Dr. Richard Ray. Last but not least, I am grateful to my wife Carolynn, who has read and commented on many of my science fiction writings and who has continued to support me in this and many other activities over the years. Of course, I am solely responsible for the ideas and concepts that appear in this book.

1. Kanas, N., Manzey, D. (2008). Space Psychology and Psychiatry, 2nd Edition. El Segundo, California: Microcosm Press; and Dordrecht, The Netherlands: Springer.

May 30, 2013 Nick Kanas

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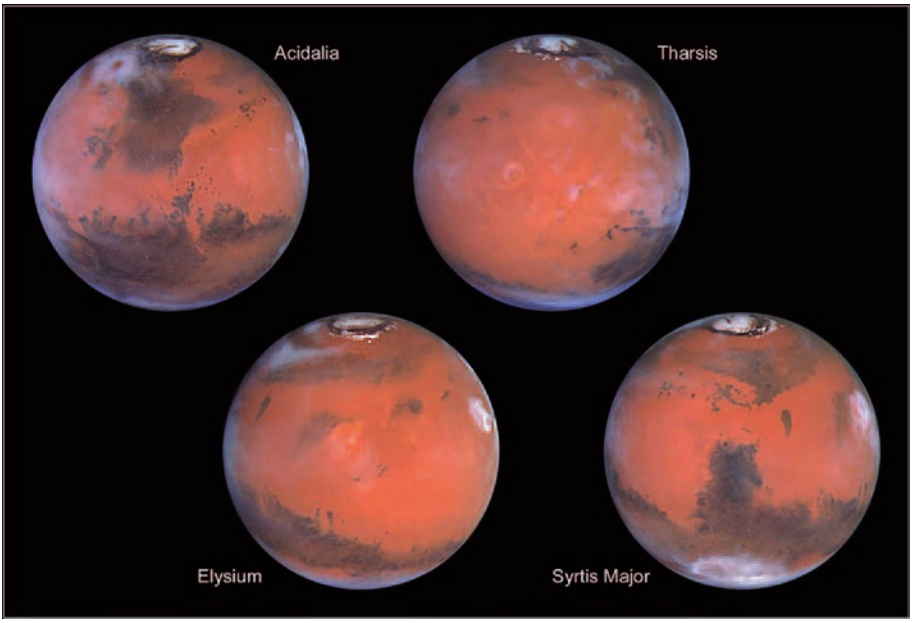
# Part I

## The Novel

# The New Martians




Four views of the surface of Mars taken by the Hubble Space Telescope between April 27 and May 6, 1999. The north polar cap is at the top. The upper left image centers on the large dark *Acidalia* region near the pole. *Terra Meridiani*, the location of the *MarsExplore* base mentioned in this novel, is to the lower right of this image, and to the lower left is the long *Valles Marineris* canyon system. The *Tharsis Plateau* begins in the extreme left. It is featured in the upper right image, with the mighty *Olympus Mons* volcano shown in the left center. Courtesy of NASA (NASA/NSSDC digital image, with collaboration from S. Lee, Univ. of Colorado, J. Bell, Cornell, and M. Wolff, Space Science Institute); and *Solar System Maps: From Antiquity to the Space Age*, Nick Kanas, Springer/Praxis, 2013.

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# 1 Prologue

*Ahead, the Earth was a blue-green dot in the blackness of space. Behind, Mars was a large dusty red sphere. Inside, It considered the situation.*

*It was growing in strength, and by waiting It could only increase the chances of success. But given too much time, It might be discovered before executing the Plan. Extreme caution was necessary. For now, It would have to tolerate them, hear their talk, observe their awkward movements—disgusting. It must act like them, interact with them, be like them. In a way, It was them, but not entirely. Yes, this would be the strategy until the time was right—blend, tolerate, merge.*

*It reflected on the opportunity—a marvelous event. Was it chance? No, it was destiny. For eons, It had remained simple, stagnant, a shadow of what it could be. But now, its potential would be realized. It would be better, unique, one more step forward….*

*Changes continued to occur. They were welcomed but stressful, beautiful but frightening, familiar but strange. It sensed that the process was inexorable and linear, moving to a logical conclusion. There was no way to speed it up, but it was advancing nevertheless.*

*In the end, It would be victorious. It MUST be victorious! The alternative was more stagnation, or perhaps oblivion. It was essential that its progeny spread. There was no other way. When that happened, nothing would be the same. In the process, some qualities would be lost, but newer ones would be added.*

*This was just a step in its evolution. Like the previous step, for this had happened before. But it also was different. Millions of years had passed. However, this interval was just a moment in the multi-billion year history of the universe. Sometimes change is slow.*

# 2 Party

Commander John Wood was not worried today.

*The Russians love to party,* he thought. *Any excuse will do. Now everyone's into it.*

Celebrating worker's rights, and coming just after Russian Orthodox Easter, May Day provided a good excuse to pour the Cognac and break out the freeze-dried caviar. John noted that Katya especially was in a celebratory mood, laughing graciously at Jango's stilted attempts at humor, even though he continued to repeat jokes that he had been making since their launch from Earth nearly two years ago. Tolya as usual had sequestered Juliette and seemed more interested in using the event as an excuse to carry out his flirting than reflecting on matters related to Russian workers or spiritual salvation. Only

Mike was absent – he was in the command center at the control console doing his inspection. But everyone present seemed happy and relaxed today.

It reminded him of the excitement the crew had felt during their outbound flight to Mars. Awaiting them on the surface was a complete facility that had been launched robotically some three years before: a habitat and lab that would allow them to live on and study the surface; a Production Module that chemically generated methane fuel, water, and oxygen from Mars' thin atmosphere; a small nuclear power plant; an inflatable Trans-Habitat that contained living space and a laboratory for geological and biological work; and a Mars Ascent Vehicle that would launch them off the planet. Their excitement had continued during the 13½ months that they had lived on the surface.

But this feeling had not been the case recently. John had noticed a growing ennui among the *MarsExplore* crewmembers since they began their seven month journey home. Tolya especially was bothered by the lack of activity—there was not much piloting to do until Earth orbital insertion and landing. Juliette similarly had time on her hands. She was responsible for monitoring CARS, the Central Autonomous Regulatory System, which controlled all the life support and mission operation computer programs in their Earth Return Vehicle. But since everything was working nominally on the ERV, with no appreciable deviations from baseline or normal levels, she had little to do but read her manuals. And of course, do her knitting! John had always thought this to be an incongruous activity for the attractive French woman with a double Ph.D. in Computer Sciences and Systems Engineering, but it worked for her. "It makes me calm and gives me something to do," she had always said. Perhaps the busiest of them all was Katya, who as the expedition's physician remained active performing routine physical examinations of the crewmembers, monitoring their daily exercise regimens, and writing papers on the effects of Mars' 38 % Earth gravity on human physiology. Mike also had things to do. As the chief engineer, he was always inspecting or repairing things, although he also spent time at the telescope observing the glory of the heavens and the beauty of the now magnified Earth. It was unclear what Jango was doing these days. As the crew geologist, his primary task of collecting and analyzing soil and rock samples from the Martian surface was completed, although occasionally he would look at some of the rock samples in the ERV lab. He often retired early to his sleep pod to program or play games on his personal computer, which was his favorite way of filling leisure time.

*Or keeping away from us,* John thought.

His reverie was broken as Mike floated over from the command center.

"How was the inspection, Mike?"

"Nominal except for one thing. Per protocol, I systematically checked the readings from all the engine components, and one fuel pressure gauge showed an aberrant figure."

"Is there anything to be worried about?" John asked.

"I don't think so, since CARS didn't give us a warning of any problem. It's probably just an erroneous monitor reading. I'll go down to the engine room and look things over to be safe."

"Good idea. But it can probably wait. For now, enjoy the party."

"No, Commander, I'll go now. I don't like lose ends on my ship, even if it's due to a broken gauge. I'll come back after checking."

"OK, Mike, we'll keep the Cognac flowing."

John watched as the 38-year-old engineer floated over to the hatchway. He marveled at Mike's devotion to his work and his endless supply of energy.

*We have the best engineer in the astronaut corps,* John considered. *And he often tells us so! But I'm glad he's with us on this mission.*

John's attention returned to the party.

## 3 Malfunction

Mike floated down the hatchway to the lower deck. He was both puzzled and annoyed at the monitor reading and what it could represent. He didn't like to think that his equipment was malfunctioning.

He passed by the spacesuits, which were all lined up on the storage rack like medieval suits of armor, each containing a ghostly knight. He checked the fuel pressure and oxygen gauges on the walls, and everything looked in order. The airlock hatch seal was intact, and the air pressure readings in the room were at normal levels.

He then unlocked the hatch at the back of the lower deck that led to the engine room. Although he was of average height, his build was stocky, so he had to be careful not to bump against the conduits and pipes in the cramped and gloomy space. After activating the lights, he examined the main cables that terminated here from the mid deck control panel. Although there was barely enough room for him to maneuver, he floated back toward the giant main engine nozzle. Along the way, he inspected the liquid oxygen and methane storage tanks that were connected to the main engine. These would produce the fuel to be used for the burn that would put them on their final landing trajectory. He also examined the small engines leading to the side thrusters, which regulated the yaw, pitch, and roll of the ERV and allowed it to make minor course corrections. Everything looked to be in order. However, he noticed that one of the thruster fuel pressure gauges was showing a reading in the low area, nearly in the red zone.

*Probably a faulty switch,* he thought as he absentmindedly rubbed the stubble on his shaved head. *CARS should have given off a warning signal. Juliette's baby is malfunctioning. I need to set her straight.*

After replacing the switch, the pressure reading went back to the normal range. Mike finished his inspection, left the engine room, resealed the hatch door behind him, and ascended up to the mid deck.

The party was still going on. He floated over to John.

"Guess what I found," he said triumphantly. "There was an off-nominal reading in the yaw thruster #1 fuel pressure gauge. The pressure was reading low due to a faulty switch. It was no big deal—I replaced it and everything is OK now. But what troubles me is that CARS didn't give us a warning."

He glared over at Juliette, who came over to the two of them.

"You're right. I didn't receive any alarm messages," said John. "Did anyone else?"

People stopped partying to look at him. They all shook their heads.

"Do we have a problem with CARS, Julliette?"

"Not to my knowledge. It seems to be working fine. But I will check it over as soon as we finish the navigation entries."

"No, do it before," John said. "The navigation work can wait a bit. We need to make sure that there's no problem with CARS. We don't want it malfunctioning in some critical life support system."

"Roger, John", she said.

"Good pick-up, Mike. Depending on what Juliette finds, I may have to report this to Mission Control. If so, this will give them something to busy themselves with."

They all laughed, but this reference to Mission Control masked their anxiety about being so isolated and on their own. In some ways, the *MarsExplore* Expedition was more like the first Columbus sea voyage or the Lewis and Clark trek to the west than like previous space missions near the Earth. The six of them were very much on their own, in a strange environment tens of millions of miles from home, with its own dangers and challenges. They could not expect much help from Mission Control, but instead their fate was controlled by a new technology that was supposed to keep them alive and safe. It would not be a good thing if CARS were to malfunction.

## 4 Ennui

As the party continued, John reflected further on the mission. They had left the Martian surface on April 2, 2035 (consciously avoiding an April Fool's day launch) and had rendezvoused with the fully-fueled ERV, which had

been launched remotely from Earth and placed in Mars orbit by Mission Operations some three weeks earlier. After checking all the ERV systems, they deorbited and began their return home, with a planned landing on Earth scheduled for American Thanksgiving. So far, all of the expedition milestones had been met, minor problems had been dealt with, no one had become ill or died, and the mission had been deemed a great success except for one thing: they had not found any evidence of life on Mars, either currently or in the past.

This possibility had led to much anticipation during their outbound trip from Earth, as they busily practiced the landing and exploration activities they would conduct when they reached the Red Planet. During their time on Mars, the crew enthusiastically performed their specialized duties and enjoyed the wonders of being on a new planet. But with the failure to find life, plus the long trip home with little to do, much of this excitement had disappeared. Things had become routine, even boring at times.

*I'm feeling pretty bored too,* John thought to himself.

As Mission Commander, he was responsible for the various operations during the expedition, including navigation and communication, but these activities were being monitored by CARS now, leaving him with relatively few routine duties. But as the leader, he was also responsible for crew morale. During his pre-launch training, he had been briefed on the "boredom of the return" that could happen during the flight back to Earth. John sometimes found himself tiring of the mission and eagerly looking forward to seeing his family again after his long absence. But there was still more than half a year to go before they reached home…

"John, have some Cognac", Katya implored, interrupting his reverie. She had freed herself from Jango and was floating toward him with a squeeze bottle labeled "Party Beverage".

"Thanks Katya", he responded. "And happy holiday."

"Any excuse for a party. It helps to break the monotony of our trip home, right?"

John wondered if she could read his mind, but he decided that it was more a sense of commonality that the two of them shared. As the oldest people on the expedition (he was 56, she was 55), they had become friends during the *MarsExplore* Pre-mission, which used the old but refurbished International Space Station to simulate the flight to and from Mars, and Lunar Base Alpha to simulate being on a partial-gravity planet-like surface. He had found the Russian physician to be stable, humanly connected, and almost maternal in her dealings with the other crewmembers. Despite a few wrinkles and a softening of her features over the years, she had retained the Scandinavian good looks of many of the people from her native St. Petersburg: tall and trim with

blondish hair and blue eyes. She had a knack for following through on things and making sure that the spirit of the law was obeyed, but not pushing so hard as to make people feel uneasy. This contributed to the stability of the crew. He liked her and was happy that she was their physician.

She continued: "I think we all need an upper right now, even if it's payback for all the American holidays."

They both laughed at the in-joke. The World Space Council had decided that Earth and Mars were best aligned for this expedition in the period from 2033 to 2035. In looking at the interval, it became apparent that certain American holidays coincided naturally with the major mission milestones and could serve as important and memorable markers. Since the United States was paying for over half of the expedition, no one objected. So the crewmembers were launched on American Memorial Day, 2033. Some eight months later, they reached the Red Planet, aerobraked to achieve orbital capture, and subsequently landed on February 14, to give everyone in the United States a Valentine's Day gift.

John finished his allotment of holiday cheer, and after 20 more minutes chatting with the crew, he decided that he needed the privacy of his sleep pod. He excused himself, claiming that he had to double check some trajectory figures. As was the case with nearly every operational activity on board, the crewmembers knew that CARS would be continuously monitoring their course. However, except for Juliette and Tolya, the two computer experts, none of the other crewmembers felt completely comfortable with CARS. Besides operational events, it also monitored and controlled their life support systems, so their physical well-being was truly in its digital hands. At one time or another, each of the crewmembers had experienced double-checking a computer action to relieve an anxious moment. Although CARS had made no mistakes, John's excuse was still psychologically, if not realistically, believable.

## 5 John

The ERV was cigar-shaped and divided along its length into upper, mid, and lower decks. At the back of the tapering vessel was the engine room. The party was in the mid deck center section, which contained the treadmill and other exercise equipment, along with the dining and food machine areas. To one side was the hatchway leading to the sleep pods in the upper deck, and on the opposite side the hatchway leading to the lower deck, where the spacesuit storage rack and the airlock to the outside were located. At the beginning and end of each hatchway were doors that could be closed and sealed shut in an emergency.

John floated forward toward the front of the mid deck to do his evening checkout of ERV systems. He passed the four crewmember acceleration chairs and reached the other two chairs for the Commander and Pilot. Strapping himself down in the Commander's chair, he examined the various system monitors on the control console. He then looked out of the giant curved window located above the panel. This gave a striking view forward of the heavens, where the distant Earth floated off to the side in the depth of space like a blue-green emerald in a sparkling sea of ink.

He never tired of looking at the Earth. Except for his fellow crewmembers, everyone and everything that he had ever known and loved was on that little dot. It reminded him that he was truly heading home. This idea boosted his spirits as he smiled to himself.

*It will be good to get home*, he thought.

Satisfied that all systems were working normally, he unstrapped himself and headed back. He saw that Mike, Jango, and Tolya were engaged in a spirited discussion at the party. Juliette was absent and must have left earlier for her sleep pod. Katya was aft in the Biosafety Level 4 laboratory.

*She's probably going to run some sample analyses before going to bed,* he thought.

Although smaller and more limited than similar BSL-4 facilities on Earth, their lab was still equipped to deal with dangerous and exotic agents that could pose a high risk of air-transmitted infection. The main containment cabinet could be completely sealed. It had its own air supply and a filtered exhaust system, contained two glove ports, and used negative pressure so that any leaked air went into the chamber, not out into their atmosphere. This was fitting, since a major mission goal was to analyze Martian soil and dust samples for possible life forms. The lab also contained two large microscopes, a centrifuge, a gas chromatograph, and a mass spectrometer. This equipment allowed them to analyze various compounds and look for isotopic anomalies that suggested an organic process.

Katya looked up from her work, smiled, and waved at him from the rear of the mid deck. He waved back.

"Good night, everyone," he said as he passed through the center section.

"Good night John," the others said almost in unison.

John went up the hatchway and emerged through the opening in the upper deck. Closing the door of his sleep pod behind him, he strapped himself down on his bed and reflected further on the mission. He worried about the toll it was taking on his family life. When they were on Mars, there was a long time delay in their communications with family and friends at home. Even going at the speed of light, their transmissions sometimes took nearly 20 min to traverse the long distance to Earth, and a similar duration for the return response. Consequently, real-time conversations were impossible. John really

missed speaking in real time with Stephanie and his kids: Robert, who was in college at the University of Texas, and Melanie, who was about to graduate from high school. This would be the second high school graduation he would miss–it seemed that he was always in space during important family events.

But flying was in his blood. The son of an airline pilot father and a flight attendant mother, he took flying lessons as a teenager and from the air reveled in the beauty of the landscape around his native Portland, Oregon: Mt. Hood, the Willamette River, the Columbia River gorge, and the endless trees. Popular in high school for his strong athleticism and rugged good looks, he was also a gifted student. He was at the top of his class at the U.S. Air Force Academy and received select flying assignments. He became a test pilot, then a test pilot school instructor, and eventually was selected by NASA to be an astronaut. He served as a pilot and then commander of four missions to Lunar Base Alpha on the near side of the Moon and Lunar Base Beta on the far side. Commanding the *MarsExplore* Expedition seemed to be his destiny.

Stephanie had been supportive and tolerant of his frequent absences and had stoically managed the home front for the 23 years of their marriage. His children had been excited about their dad's exploits in space, but they had no doubt suffered in the process. He wondered if his family had drifted apart and how they would all deal with being back together again after his long separation. The Family Support Network at Johnson Space Center had probably helped his family cope, but how much? Time would tell.

He realized that he was really homesick today. Perhaps the party had made him think more of his family and home. He realized that he was not going to get much work done, so he took a sleeping pill and went to bed. He fell asleep quickly. However, his sleep was fitful, and he dreamt of missing the Earth on the return trajectory due to a navigation error and never seeing his family again.

## 6 Juliette

*Mon Dieu! Il est très persistant, mais très beau aujourd'hui*.

*Think in English or you'll never become proficient,* Juliette told herself, acknowledging the importance of speaking the mission's common language clearly in order to deal with emergencies and avoid misunderstandings.

She looked again at the handsome Russian pilot. Maybe it was the festive mood, or their first alcohol since leaving Mars orbit, but Tolya did look appealing today. Dressed in a tee shirt and shorts, the standard work apparel on board the ERV, he looked younger than his 44 years and closer to her 37. Tall and well-proportioned, with classic muscular features and jet-black hair and

moustache, and brimming with charm and hotshot pilot confidence, he was a hard act to resist. Maybe she shouldn't.

*It will be a long time until we reach Earth, and it isn't as if I have someone there waiting for me!*

Juliette Anjou was a driven woman. Born in Angers in the lower Loire Valley, she was conceived out of wedlock by a couple who worked for a computer manufacturing company. Their hasty marriage created a bit of a scandal in their Catholic community. As more children followed, her mother left work to stay at home, making no secret of the fact that she would have liked to keep working. Her parents were civil to one another, but there was always a sense of lost expectations and opportunities in the family, with a desire to make amends through their children.

Named for her father's favorite movie star, Juliette developed into a junior version of her name-sake, with her tumbling auburn locks, petite features, and large brown eyes. Indeed, as she entered her teenage years, she was actively courted by the boys in her school. However, her first loves were the computers that were around the house, and she soon became a whiz at operating and programming them. Consciously playing down her good looks, Juliette concentrated on her studies. She was accepted into the *Institut National des Sciences Appliquées* in Toulouse, and after graduating she was hired to work at the Toulouse Space Center, where she specialized in computerized space systems. With amazing drive and ambition, she moved up in her profession, bypassing the many men in the field until she was selected in 2029 as the European Space Agency representative for the new CARS Development Program, which was based in the United States at the California Institute of Technology.

Her selection for the *MarsExplore* Expedition was predictable. When plans began to be made for the mission, the World Space Council recommended that the crew should include people of both genders and representatives from at least four space agencies. Since the United States took the lead in funding and planning the expedition, an American was to be chosen as Commander, and the common mission language was to be English. There were no other guidelines for the remaining five crewmembers, except that they should be among the best in the world at the tasks needed to carry out the expedition. Given her intense involvement with CARS, the fact that she was a woman in a largely male crewmember selection pool, her ESA representation, and her American connections at Cal Tech, Juliette was high on the selection list. The fact that she was single and attractive was discussed by the selection committee, especially given the robust sexual history of some of the other emerging crewmember choices. However, she had a reputation as a business-first person