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WHY MARS? SCIENCE AND EXPLORATION OF THE RED PLANET INTO THE 21ST CENTURY

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As we approach the 1998 centennial of H. G. Wells' famous "War of the Worlds" novel of Martian invasion, we find that the world is again captivated by the possibility of life on Mars. The most recent ideas center on observations made over the past 20 years in the various extreme environments in which life occurs on Earth. The excitement also results from the August 1996 announcement by a NASA Johnson Space Center team headed by David S. McKay of possible evidence for fossil organisms inside a meteorite from Mars. As many as 13 spacecraft are currently expected to be sent to Mars by the U.S.A., Japan, and other nations between 1996 and 2005. The U.S. Mars Surveyor spacecraft that will launch in 2005 is planned to bring samples to Earth in 2008. Why is there so much interest in Mars?

One of my colleagues, Jeffrey M. Moore, once remarked that "Earth is the most Mars-like planet in the Solar System." Mars and Earth share many similar characteristics: length of day, axial tilt, and landforms like volcanoes and dry fluvial valleys. Examination of Mars provides new perspectives on our home world, offering a basis of comparison and an exciting means to foster global scientific and social perspectives. Mars is important to us, scientifically, because in the 21st Century it has the potential to become the starting point from which we can begin to answer some of the most fundamental human questions: "Where do we come from?" and "Where are we going?"

Mars and Earth may have been very similar in their first half-billion to billions years; but Earth's vigorous erosion and tectonism have destroyed our oldest rocks. Mars offers a place where we can examine the early history of a planet similar to Earth. Mars offers the possibility to examine the fossil record of the earliest life that can develop on such planets. Mars offers the opportunity to better understand where life comes from, and why it is here. At the same time, Mars has the potential to become a second home for humans. The unifying theme of the U.S. Mars Surveyor Programme is "water". Water is the key to finding evidence of martian life, the key to understanding martian climate, and would be essential if humans are to ever explore the planet in person.