Mars: A Traveler's Guide
by Ruth Nestvold

Ruth Nestvold lives in Germany and has a Ph.D. from the University of Stuttgart (but she asks not to be called Dr. Ruth). Since attending the Clarion West writer's workshop in 1998, she sold stories to *Asimov's, Realms of Fantasy, Strange Horizons,* and about a dozen other anthologies and magazines. Her first novel, *Yseult,* has just been sold to a German publisher.

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You have chosen the topic "dust storms":

Dust storms on Mars can encompass the entire planet. Global winds disperse the dust until the entire surface is covered and sunlight is cut off. When sunlight can no longer warm the ground, the effect stops. These storms are connected with the dominant weather patterns and the warmer summers in the southern hemisphere—

You have chosen the topic "weather patterns":

Weather on Mars consists of storms made of dust rather than rain. Typically, these storms occur during summer in the southern hemisphere, which on average is warmer than the northern hemisphere because it comes appreciably closer to the sun as a result of the elliptical orbit of the planet. The rapid heating of the surface gives rise to the famous "dust devils": when the temperature difference between lower and higher altitude air is great enough, pockets of warm, rising air expand and turn into whirlwinds that pick up dust. These dust devils can trigger global storms. The dusty air absorbs sunlight, warming the upper atmosphere and changing wind patterns. The dust particles in the clouds trap infrared energy, helping to make the planet's atmosphere warmer.

Weather patterns are extremely difficult to forecast because the changes are dramatic and can result in abrupt planet-wide swings between dusty and hot and cloudy and cold—

I'm sorry, I have no entry in my database for "rover accident."

Would you like to select a new topic?

You have chosen the topic "pressurized rover":

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You have chosen the topic "pressurized rover" :

The pressurized rover is especially designed to withstand the stresses of the Martian environment. The passenger compartment is protected by a waffled body tub in order to ensure that the cabin will not lose pressure in case the outer shell is damaged. Radiator fins help control the interior temperature. The rover has two independent hydrogen fuel cell systems, one on each side, and a power transmission grid wired directly into each wheel—a design very resistant to breakdowns—

You have chosen the topic "fuel cell" :

The fuel cells in the rover are

powered by hydrogen (H2), working through a nanocontrolled catalytic membrane rated for Mars-normal surface conditions. These fuel cells can also provide power to pressure suits, exploration droids, and other Mars excursion implements. Hydrogen is available from a number of sources including subsurface ice deposits, trace amounts in the Martian atmosphere, and ice shipped on low-energy trajectories from Jovian orbit or salvaged from cometary bodies.

If you'd like me to repeat this entry, say 'repeat.' If you'd like to explore a new topic, simply say the name of the topic. If you're done using the Mars Traveler's Guide , *say 'quit' to shut the*

system down.

Return to the topic "dust storms":

Some dust storms rise up to eight kilometers above the surface of the planet and may carry many tons of fine red dust. Heavy dustfalls can be dumped on areas below the datum plane or within areologically sheltered formations that otherwise experience little or no direct impact from the storm. Major dust storms can cause brownouts, leading to dramatically decreased visibility, which may be so bad that the horizon, landmarks, and nearby safe havens cannot be seen. If this should occur, travelers are advised to use GPS navigational assistance. Martian scientists, however, are rapidly

developing the technology to predict dust storms, making it possible to take extra precautions in advance against the danger of dust particles.

If you'd like me to repeat this entry, say 'repeat.' If you'd like to explore a new topic, simply say the name of the topic—

You have chosen the topic "dust particles":

Dust is one of the biggest dangers to travelers on Mars. Dust devils with wind speeds of over one hundred fifty kilometers per hour can carry the particles into rover engines, bearings, machinery, air-locks, and pressure-suit fittings. Dust may travel at such high velocity that it can have an effect

resembling sandblasting on equipment and viewports—

You have chosen the topic "GPS" :

GPS is available extensively near the Mars bases and within the planet's equatorial zone thanks to line-of-sight repeaters. At this time, there are not enough satellites deployed for full-time planetwide coverage, but our experts at Red Planet Adventures project that within ten years, satellite coverage will reach one hundred percent.

Availability of navigation services and other kinds of satellite-based communications may be hampered by landforms with an altitude differential sufficient to obscure the satellite footprint or repeater sightlines. In the

case of an emergency in which communication is not possible, your tour guide will direct you to the nearest Mars base as quickly as possible.

If you'd like me to repeat this entry, say 'repeat.' If you'd like—

You have chosen the topic "Mars bases" :

The bases on Mars at present include Sagan in Kasei Vallis—the first and largest, and also headquarters of Red Planet Adventures—Gagarin in Hebes Chasma in the Valles Marineris system, Armstrong in the Gusev Crater, the most isolated of the Martian bases—

You have chosen the topic "Armstrong Base" :

Neil Armstrong Memorial Base is

situated north of Ma'adim Vallis in the Aesis region of Mars. The site in the Gusev Crater lies at the mouth of a very long fluvial valley dating from about 3.5 billion years ago. The area has provided some of the earliest evidence for ancient Martian microbes—

You have chosen the topic "Ma'adim Vallis" :

Ma'adim Vallis is one of the largest canyons on Mars. Over seven hundred kilometers long, twenty kilometers wide, and two kilometers deep in some places, it offers breathtaking vistas to the Mars adventure tourist. The course of the valley runs from a region of southern lowlands thought to have once contained a large group of lakes north to Gusev

Crater near the equator, the location of Armstrong Base. The tour from Armstrong the length of the valley of Ma'adim is one of the most dramatic offered by Red Planet Adventures—

Return to the topic "Armstrong Base":

While it does not yet provide the level of amenities available in Sagan or Arestia with their geodesic domes, Armstrong Base has its own picturesque charm for adventure tourists. Its networked habitat is reminiscent of the early days of Mars colonization and provides a feel for authentic history. But even here, tourists need have no fears regarding safety considerations. The individual pods in the habitat are

constructed from titanium-reinforced buckyplastic, equipped with double air locks, and connected to each other with inflatable tunnels of neoKevlar. Spacesuits are provided for all visitors and included in the tour package. However, it is not recommended that tourists attempt to explore Gusev Crater or nearby Ma'adim Vallis without an experienced tour guide.

If you'd like—

You have chosen the topic "Safety Considerations":

Tours with Red Planet Adventures have been optimized for safety—

I'm sorry, did you say 'vacuum'?

I'm sorry, I don't understand the phrase, "no eye said fuck you."

Would you like to select a new topic?

You have chosen to return to the topic "Safety Considerations" :

Despite the hostile environment of Mars, Red Planet Adventures has never had a fatality in the three years we have been offering our tours. While every effort has been made to ensure the safety of our guests, we would like to remind you to use extreme caution at all times while traveling the red planet. Mars dust is a major potential threat to both machinery and humans: dust devils have been known to disable computers and delicate electronics, interfere with radio communications and even damage pressurized human habitats. It is necessary to keep in mind that despite

initial terraforming experiments, the atmosphere, the air temperature, and the barometric pressure are still such that Mars remains uninhabitable for humans outside of the habitats. Pressure suits should be worn in all situations where it is possible that the visitor might be subject to Martian elements—

You have chosen the topic "Pressure Suit" :

The pressure suits provided for guests of Red Planet Adventures are state-of-the-art suit technology, employing mechanical counter-pressure (MCP) for the extremities of Martian exploration. The MCP suit system consists of a lightweight, elastic bio-suit layer, hard torso shell, portable life-support system,

helmet, gloves, and boots. The life-support system attaches to the torso shell. The MCP suit exerts pressure on the body through the form-fitting bio-suit rather than by the breathing gas. The helmet, attached to the life-support system, provides pressurization to the head as well as oxygen for breathing. Tears in an MCP suit can cause symptoms of localized low pressure exposure at the site of the tear (such as bruising and edema), but the rest of the body remains protected: the elastic weave of the bio-suit prevents the tear from propagating.

The power cells running the suit's life-support system can be recharged using standard hydrogen fuel cells, such

as those powering a pressurized rover, for a service life of up to twelve hours. Integrated into the suit is a communications module, biosensors, and the computer you are at present accessing—

You have chosen the topic "communications module":

The communications modules of the bio-suits provide a direct connection to the communications systems in the Mars bases via satellite coverage. This ensures that the traveler can easily contact the rover or the nearest base in case he or she gets lost—

You have chosen the topic "satellite coverage":

Red Planet Adventures does not

conduct tours where satellite coverage is unavailable; however, signals may be hampered by land formations such as walls of craters or valles, or rough chasmal terrain, among others. Such areas which are frequently traveled will have GPS and comm repeaters mounted along the rim or higher altitudes at regular intervals. If spotty coverage still occurs, it may be the result of storm damage. In the case of an emergency situation, your tour guide—

I have no entry in my database for "tour guide dead."

Would you like to select a new topic?

You have chosen the topic "Emergency" :

In the case of an emergency situation,

your tour guide—

I have no entry in my database for "fuck you."

Would you like to select a new topic?

You have chosen the topic "Emergency Situation" :

A number of accidents qualify as emergency situations according to the Mars Emergency Rescue Statutes (MERS):

1) Damage to a habitat that would endanger pressurization or breathable oxygen levels.

2) Damage to an oxygen production plant.

3) Failure in a wind or solar energy plant.

4) Failure in the communications

system—

You have chosen the topic "Failure in the Communications System" :

In the case of a failure in the communications system, make your way to the nearest relay station or base as quickly as possible and notify the proper authorities of the failure. This transport-based database will provide you with all the information needed for MEA to localize the problem.

You have chosen the topic "Failure in Ground Transportation" :

In the case of a failure in ground transportation, notify the proper authorities via satellite as quickly as possible.

You have chosen the topic "Failure

in Multiple Systems" :

In the case of a failure in multiple systems, a number of options are available, including the following:

1) Repair of the ground transportation.

2) Repair of the communications system.

3) Manual signaling to nearby bases or relay stations.

If none of these options is feasible, it may be necessary to navigate on foot to the nearest base or relay station. With an undamaged bio-suit and full oxygen reserves in the life-support system, an experienced Mars explorer can survive for several days in the open environment. It is, however, critical to maintain suit reserve power: the traveler

should be careful not to stray too far from the rover's fuel cell capacity in order to ensure that batteries can be recharged—

You have chosen the topic "Fuel Cell Damage" :

Damaged fuel cells can be replaced at all Martian bases. In the event that rover fuel cells are damaged to the extent that return to a base is not possible, notify Mars Emergency Authority immediately.

If you'd like—

You have chosen the topic "Notify Mars Emergency Authority" :

In order to notify the Mars Emergency Authority (MEA), use either the communications module in your pressure suit or the communications system of the

rover. Give your location, the unit number of your tour, and a precise description of the problem. A rescue team will be to your site within eight hours.

I have no entry in my database for "rescue my ass."

Would you like to select a new topic?

I'm sorry, the volume of your last request was too high for me to understand. Please repeat.

You have chosen the topic "help" :

The Help System of the Mars Traveler's Guide is an extensive database covering a wide range of topics, both informational and practical. If you do not find the topic you need, contact user support and make a

suggestion. We are always happy to receive feedback.

If you'd like me to repeat this entry, say 'repeat.' If you'd like to explore a new topic, simply say the name of the topic. If you're done using the Mars Traveler's Guide, say "quit" to shut the system down.

* * * *

You have not made a selection for more than ten minutes. In order to access the database, select a topic on your wrist unit or voice a topic of your own. If there is no appropriate entry in the database, search for a similar word or term. If you are no longer in need of the help system, select or voice "quit."

Would you like to select a new topic?

* * * *

The system has been idle for more than thirty minutes and will go into sleep mode. To reactivate the system, simply voice your request.

* * * *

The system has been idle for more than sixty minutes. This system is shutting down.