



Mars and the Monument



Mars



White Sands

Ever since the Mars Rover Opportunity landed on the surface of Mars in 2004, scientists have begun to see the monument in a whole new way. This is because when Opportunity landed it found itself in a large playa—a dry lake bed interdunal environment similar to that of Lake Lucero at White Sands—called Meridiani Planum.

Like White Sands, many of the rocks and dunes in this area are sulfates and are composed of gypsum (Calcium Sulfate), the same mineral that makes up the snow white dunes of White Sands. Sent to discover if life has ever been possible on the red planet, the twin rovers Spirit and Opportunity landed on Mars in January of 2004. Their first step was to find evidence of liquid water on the Mars surface. Though they were designed to last for only three months, both have survived their mission well. Though now in hibernation, Spirit gathered data for more than five years in bonus extended missions, while Opportunity has worked reliably for seven years. Opportunity is still fully functional and continues to operate on Mars' surface. Both rovers have made important discoveries about wet environments on ancient Mars that may have been able to support microbial life. Just like on Earth, vast areas of Mars are made of gypsum that form dunefields similar to those here at White Sands.

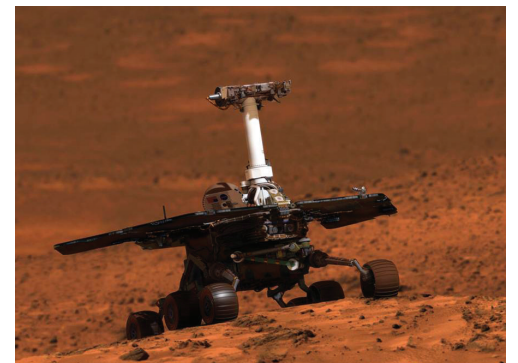
Data from these dunefields suggests that the vast field of gypsum on Mars is a likely place to find traces of life if

it has ever existed on Mars. Gypsum is the most common calcium sulfate mineral. It comes out of seawater and is usually found in evaporated beds associated with sedimentary rocks—just like the gypsum here at White Sands. Because of the way it is formed, gypsum often holds microscopic fossils. Professor J. William Schopf of the University of California, Los Angeles states that if fossils trapped in gypsum can last for millions of years on Earth, it is very likely that they might also be found on the dry seabeds of Mars.

Have you ever noticed the crunchy tan soils that fills the areas between the dunes at White Sands? That soil is composed of a living organism known as cyanobacteria, or blue-green algae. This is similar to another important find that the rovers have revealed on Mars—a form of pond scum, one the building blocks of life. The existence of this pond scum along with sulfates is a strong indication that there was once water on Mars and perhaps life.

This new relationship to Mars has brought about many new and exciting

research projects. One of the major focuses of these projects is based on the influence the atmosphere has on gypsum soils of White Sands and Mars and what the atmosphere is like on Mars, both now and in the past. Since Mars has weather patterns, seasons, and winds just like we do on Earth, scientists are also investigating how dunes migrate on both planets. But that's all in due time. The next mission to Mars launched on November 26, 2011. The new rover, Curiosity, is about the size of a small SUV and features the most up-to-date technology. It is scheduled to be on Mars for nearly two years investigating Gale Crater for evidence of conditions that were favorable for microbial life. It will be exciting to see what it reveals next!



Mars Rover Opportunity