NASA Goddard Instrument Makes First Detection of Organic Matter on Mars

Transcript:

(Music) (Music) (Music) (Music) SAM stands for the Sample Analysis at Mars instrument suite. It's really one of the most complex and analytical chemistry laboratories ever sent to the surface of the Red Planet. It's been miniaturized to fit right into the body of the Mars Science Laboratory Curiosity Rover. One of the major goals of the Mars Science Laboratory mission is to search for habitable environments in Gale Crater. And by by habitable environments, what I'm talking about are environments that could have supported life. (Music) So there are several pieces of big news that SAM has found. The first is the discovery of methane. Now methane has been found previously in the Martian atmosphere by both Earth-based telescopes and space-borne orbiters. But this is the first time that we've actually seen a sharp increase and decrease in the abundance of methane in the atmosphere in Gale Crater. What this really means is that present day Mars is an active environment. Now at this point we don't know the origin of this methane. It could be biological, from maybe methanogenic bacteria deep in the subsurface releasing methane. But there are non-biological explanations as well - such as water-rock interactions in the subsurface that could also produce the methane signals that we're seeing. The second exciting discovery from SAM is the detection of Martian organic compounds. We found several different types of organic molecules including chlorinated alkanes and chlorobenzene - compounds that are not common on Earth - in a mudstone that was deposited in an ancient lakebed environment in Gale Crater. This is a really exciting discovery because we've been looking for organic compounds for decades on the surface of Mars. And this is the first time that we've actually found Martian organic material in the surface. Now, at this point we don't have enough evidence to tell us whether or not the organics we're finding are biological or non-biological in origin. There are several viable non-biological explanations, including this organic material could have come down from space - from meteorites or comets. Or, organics can be formed by geological reactions in the rock itself. Now what's exciting about this discovery is it gives us new hope in the search for chemical evidence of life. We've found the organic material, now the next step is trying to figure out what its origin is. (Music) So in addition to the measurements made by SAM on Mars, we've had to do hundreds of laboratory experiments back on Earth to simulate the conditions on the surface of the Red Planet in order to convince ourselves that the organic material we were detecting by SAM was really Martian in origin and not something that we had brought with us to Mars. (Music) So although at this point in the mission we can't conclude that there was definitively life on Mars, the SAM discoveries have really shown us that all of the basic ingredients for life were there - including complex organic compounds, the building blocks of life. Now with the detection of organics in Gale Crater, the probability that Gale Crater Lake could have supported life goes up. (Beeping) (Beeping)