Methane in the Martian Atmosphere

- Methane gas was recently detected in Mars’ atmosphere using groundbased telescopes
- The methane gas distribution is patchy and changes with time
- Most methane in Earth’s atmosphere is produced by life, raising questions about its origin on Mars

*View of Mars colored according to the methane concentration observed in the atmosphere. Warm colors depict high concentrations.*
Recent Release of Methane

- Methane in the atmosphere should be destroyed by UV light within a few hundred years.
- Methane observed now must therefore have been produced recently.
- Variations in space and time suggest that it was recently released from the subsurface in localized areas.
The Big Picture

- Where can the methane come from? From analogy with Earth, there are two leading theories for the origin of recent subsurface methane at Mars:
  1. Methane is produced by water-rock interactions
  2. Methane is produced by bacteria, in regions where liquid water is found

Either theory implies that the Martian subsurface is dynamic

- Future observations can test for trace chemicals associated with each process

Methane on Mars could be produced chemically through liquid/rock interactions (top) or biologically (bottom)
For more information...

Press Releases
- space.com - 1/15/09 - “Mars Methane: Geology or Biology?”

Images
- All images (and accompanying animations) can be found at:

Source Article (on-campus login may be required to access journals)
  http://www.sciencemag.org/cgi/content/abstract/323/5917/1041

Related Articles (on-campus login may be required to access journals)
  http://www.sciencemag.org/cgi/content/abstract/306/5702/11758
  http://tinyurl.com/krasnopolskyicarus2004