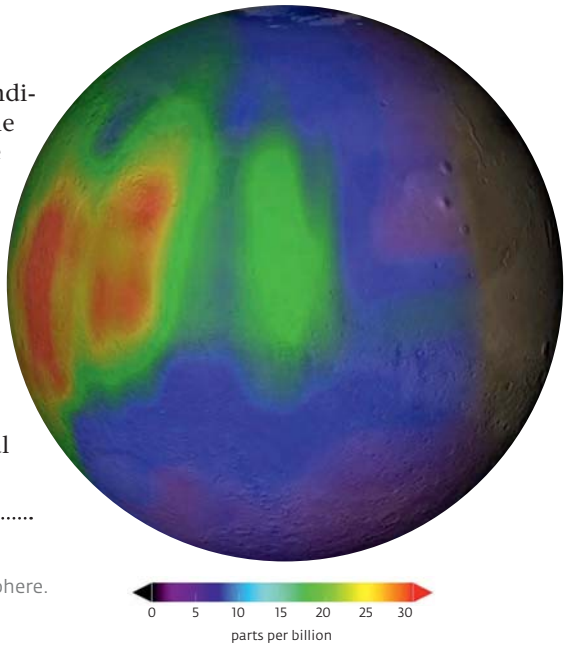
# Still No Life on Mars

Intense UV radiation on the red planet releases methane from organic material transported to the surface by meteorites

Some astronomers eagerly pursue every clue about life on Mars – but one of them might just have gotten away from them. The methane that was discovered in the Martian atmosphere nine years ago and that was considered as a possible sign of living organisms very probably originates from a geochemical process. An international research team led by Frank Keppler of the Max Planck Institute for Chemistry in Mainz has established that a meteorite found on Earth releases methane when the scientists irradiate it with intense ultraviolet light under Martian conditions. The constituents of the heavenly body resemble those of meteorites and stellar dust particles from space that bring carbon-containing molecules with them and continually collide with the Martian surface. Some researchers considered the methane on Mars to be evidence of extraterrestrial life because, on Earth, it originates primarily in biological processes. (Nature, May 31, 2012)




Methane concentration on Mars: The graphic shows the calculated atmospheric methane concentration in parts per billion (ppb) on Mars during the summer in the northern hemisphere. Violet and blue areas indicate little methane, while red areas signal large quantities.

# The Incisive Design of the Spider Claw

The animals owe their predatory success to, among other things, the ingenious composition and structure of the material that makes up their venomous fangs

Flies and other insect prey can do little to counter the bite of a spider – even though their armor consists mainly of chitin and proteins, just like the venomous fangs of the predator. However, the exact chemical make-up and microstructure of the venomous fangs have been optimized to be able to penetrate the armor of the prey. A research team headed by Yael Politi and Peter Fratzl from the Max Planck Institute of Colloids and Interfaces in Potsdam discovered this while researching the wandering spider *Cupiennius salei*. Accordingly, the chitin fiber in the venomous fangs runs parallel to the trajectory of the spider bite; they are more rigid in this direction than perpendicular to it. Moreover, the proteins that form the tip and shell of the fang are strongly cross-linked with metal ions, so that they transfer pressure especially well to the cuticular armor. These findings can provide inspiration as to how similar materials can be optimized for various applications. (Advanced Functional Materials, March 22, 2012)


left image: The tropical wandering spider *Cupiennius salei*

left top: Computer tomography image of the tip of a venomous fang. The orange arrow indicates the opening of the venom canal.

left bottom: Distribution of the zinc ions (red), calcium (blue), and chlorine (green) is analyzed with energy-dispersive X-ray spectroscopy and made visible using false colors. Zinc and chlorine occur in the external layer, while calcium is located in the inner layer. In addition, an increased concentration of zinc was observed in the fang tip interior.

Photos: NASA (top), R. Barth (bottom left), MPI of Colloids and Interfaces (bottom right)