MCCC News

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Commodore Free Magazine

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Curiosity to Explore Martian Dunes

A mix of rock and sand greeted the Curiosity Rover as it approaches the Bagnold Dune field, the dunes slowly encroaching on weathered outcrops. This is our first visit to active dunes anywhere but on Earth. Curiosity is currently taking photos as it inches closer and closer to the dark sands of the Bagnold Dunes. Once it reaches its target dune, it'll use its scoop to collect a sample for analysis, and sideswipe the sand with a wheel to scuff a fresh surface to ogle the dune's interior.

The position of the Curiosity Rover is marked on the satellite image below, near the center. *[Editor's Note: Check on-line for the images. There is too much detail to show clearly here.]* Interestingly, none of the outcrops share the distinct dark colour that would indicate an easy source for freshly-eroding sediment.

Curiosity's path is marked with a thin yellow line and tiny black datestamps. Image credit: NASA

The dark Bagnold Dunes are composed at least in part of olivine, a mineral common to dark volcanic rocks (basalt). Researchers are hoping Curiosity will be able to determine if the wind is sorting minerals, separating heavier olivine from other minerals.

The Bagnold Dunes are active: satellite images reveal them creeping about a meter (3 feet) per year. This is our first up-close look at Martian sand dunes, in contrast to sand ripples and drifts. Unlike ripples or drifts, dunes have enough sand that the windblow sediments can slide down the steep downwind face.

The texture of Martian dunes is different than here on Earth. Mission planner for the dune expedition Nathan Bridges explains:

"The ripples on them are much larger than ripples on top of dunes on Earth, and we don't know why. We have models based on the lower air pressure. It takes a higher wind speed to get a particle moving. But now we'll have the first opportunity to make detailed observations." Curiosity Rover Eases Into First Exploration of Martian Dunes

A colourized version of the Bagnold Dunes assembled from multiple frames. Image processing may have over-darkened the dunes. Image credit: NASA/Paul Hammond

Interesting geological features in this area will be named for Nambian geological place names in a tribute to the Namib Desert that has offered such an excellent terrestrial analogue for interpreting Martian dunes and playas.

http://space.io9.com/curiosity-rover-eases-into-first-exploration of-martian-1744909257

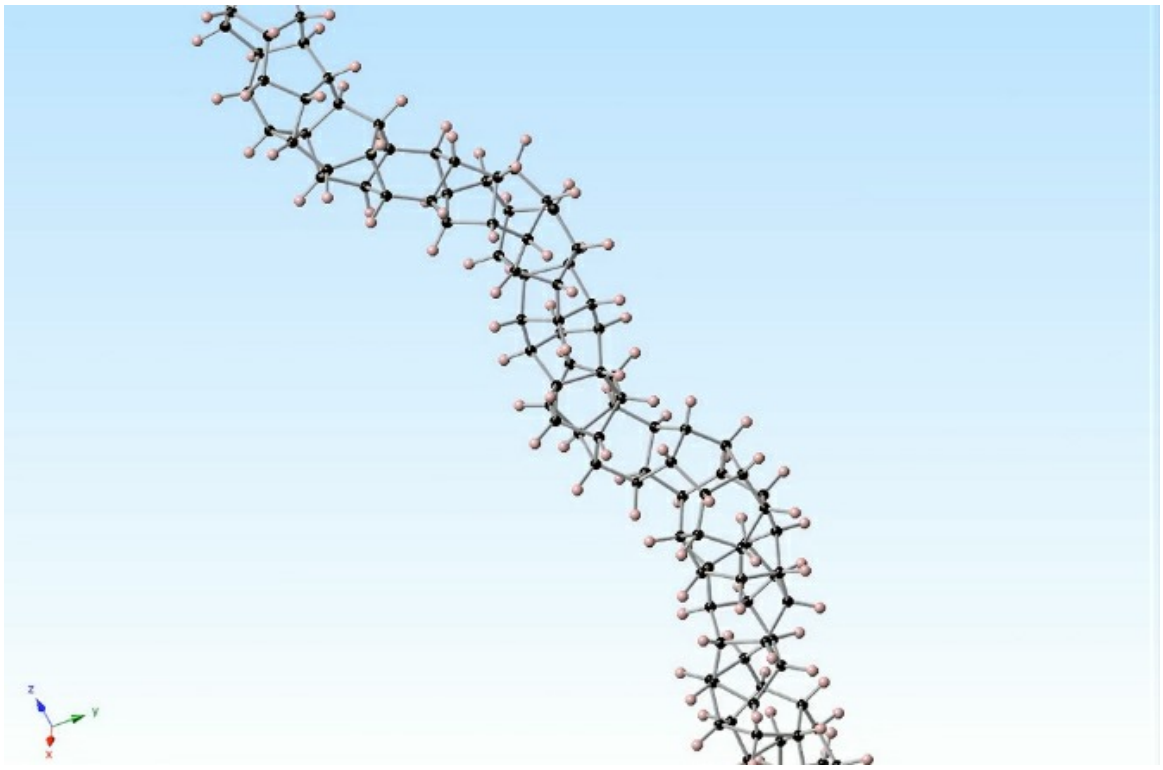
Space Elevator May Be Built of Diamond

If the notion that humans will one day ascend into orbit on a rope of ultra strong carbon nanofibers sounds a bit out of this world, then you're going to love the latest dazzling twist: our future space eleva-

tors might actually be built of diamond.

Graphene may be the hottest substance in materials science right now, but over the past year, the scientific community has worked itself into a tizzy over another carbon-based wonder material: diamond nanothreads, one-dimensional carbon crystals that are as strong as, well, a diamond.

Now, to be fair, we're not totally sure diamond nanothreads deserve the attention they're getting they've only been produced by one lab at Penn State University, and it's not clear how easy it's going to be to mass produce these brilliant fibers. There's also concern that diamond nanothreads will become increasingly brittle as they get longer, which would probably put a 62,000 foot diamond space cable out of the question.



Black circles on the diagram represent carbon atoms, pink circles are hydrogen. Image Credit: John Badding Lab / Penn State University

But a recent modeling study from a team at Queensland University of Technology shows that when molecular defects are inserted into the otherwise repetitive benzene ring structure of a diamond nanothread, the fiber becomes highly ductile. With the right molecular design, the researchers suggest that diamond nanothreads could be "ideal for the creation of extremely strong three-dimensional nano-architectures."

If the new models turn out to be correct, this material could have a bright future in all sorts of applications, from nanotechnology to electronics to yes, maybe even space elevators. Diamonds in the sky? Still a fantasy, Rihanna. Diamonds transporting us to the sky? A long shot, but we'll keep an open mind.

http://gizmodo.com/our-future-space-elevator-may-be-built-of-diamond1743971206

December Calendar

December 7 — Amiga-By-The-Loop Chapter
7:00 PM — Main Grand Prairie Library
901 Conover Drive, Grand Prairie

December 7 — Board of Director's Meeting
Approximately 9:00 PM — Location TBD

December 27 — Newsletter Deadline — 8:00 AM