

## HLS2 Hangouts – 28 July 2016

### Chat Transcript

[Laura Kerber](#)

To add: regional dust storms are more common than global dust storms, and they are more common in certain regions than others.

[Rob Mueller](#)

How much does visibility degrade in a bad dust storm? (*Click for the answer: [15:15](#)*)

[David Beaty](#)

We have not observed a bad dust storm from the ground

[Laura Kerber](#)

Any surface weather stations would help us improve our global and regional climate models, which would help us understand how dust gets lifted and how and why dust storms grow. ~Laura Kerber

[Pan Conrad](#)

Three of us presented a poster at that October workshop on an approach to environmental monitoring. (Conrad, Bleacher, and Van Susante).

[Laura Kerber](#)

p.s. - The "Mars Climate Database" is a handy place to look for climate variables. The database was created by feeding real climate data into a GCM and using the model to fill in the gaps.

[Joe Cassidy](#)

Can we use electrostatic means to repel dust? (*Click for the answer: [32:12](#)*)

[Fred Calef III](#)

I suspect it would be more akin to 'brushing' than shoveling or maybe even just wiping, a la cleaning the front windows of your car after a dusty road trip.

[Michael Meyer](#)

BTW Opportunity had to "sleep" in 2007 because of a regional dust storm where light reached a tau of 4.7 (essentially 99% of the light blocked by dusty atmosphere)

[Joe Cassidy](#)

Thanks!

[Laura Kerber](#)

Can you have a compression suit with pressurized gloves and helmet? (*Emailed response below*)

There have been several combinations of mechanical counter pressure (MCP) and gas pressurized components in space suit concepts over the past 50 years. In all cases, the helmet is a gas pressurized component, but one of the real challenges in MCP design is making the transition between gas and mechanical pressure elements without creating a detrimental pressure gradient (too little compression or too much compression across a small area) that could cause severe injury depending on location. Many MCP concepts also incorporate an air bladder on the chest to allow for proper expansion/contraction of the lung cavity during breathing without loss of the pressure on the skin. NASA recently completed a contract with Final Frontier Designs for a pair of MCP gloves that can be tested with the lower arms of our gas pressurized suit in a delta pressure glovebox. We are very interested in improving the dexterity of our space suit gloves and are investigating both traditional and non-traditional pressurization methods to address that problem. Testing this fall will help us to better understand the potential of both options.

## [Human Landing Sites Study HLS2](#)

HLS2 resources, including workshop presentations and briefings, are on our web site here:  
[www.nasa.gov/journeytomars/mars-exploration-zones](http://www.nasa.gov/journeytomars/mars-exploration-zones)

[Mat Kaplan](#)

Great presentations! Thanks very much.

[Laura Kerber](#)

Very interesting!

## **Emails**

**Jim Schier**

Answer to Larry's question: Optical comms is being designed to constantly measure the signal-to-noise ratio (SNR) over a communications link. As the SNR is measured, the smart communications protocol will use Adaptive Coding and Modulation (ACM) to adjust the data rate up or down depending on how strong the link is. Your cell phone here on Earth already does this. A new technology being developed operates at the network layer over the communications link. The smart networking technology is called cognitive networking and will provide a similar capability to dynamically adapt communications across the network based on current conditions. The network will also learn from its experience and get smarter over time.

The next question to ask is: Will the software applications on all of the Mars systems be modified to take advantage of these smart communication and networking features? For example, the streaming imagery app will automatically downshift from 4K to 1080p to NTSC resolution as the dust increases but will the telerobotic controller be able to adjust to lost packets that decrease the amount of force feedback so that the operator can continue to work in spite of reduced sensory feedback?

**Valeryi Yakovlev**

Hey Rick,

I listened to the Hangouts session in full. It was really useful that there were a lot of visual materials. For me, this was very helpful. Some feedback. Periodically, the quality of the visual for the slides would degrade. I did not get a chance to ask questions as language was a barrier for me. The number of viewers was 36-47, presumably mostly from the Workshop community.

I intend to watch all of the other hangouts that have been made. You and Ben are doing really needed work.

Greetings from Bishkina.