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UND Human Spaceflight Laboratory Newsletter

From Space Suits to Habitats: The UND Human Spaceflight Lab

Welcome to the first in a year-long newsletter series profiling the people and projects at the UND Human Spaceflight Laboratory (HSL) at the Department of Space Studies.

The newsletters will provide monthly updates as we design, build and test an Inflatable Lunar Habitat with an attached electric rover, as well as other activities at the lab. We will test the habitat in the field in Winter 2013.

Research at the laboratory began in 2004, providing relevant, real-world experience to dozens of

students from around the world.

Our other research includes:

- Two space suit prototypes. We built the North Dakota Experimental-1 (NDX-1) suit for the surface of Mars. The second suit, the North Dakota Experimental-2 (NDX-2) suit, will be used for lunar simulations. UND is the first university with a NASA-funded laboratory for the purpose of developing space suits such as these.
- Spaceflight simulation using

two fully operational simulators – one based on NASA's Apollo spacecraft, and the other modelled on the first privately owned space vehicle to fly into space: SpaceShipOne.

We will post updates frequently on our upcoming Facebook page and Twitter account.

For more details about the program or to contact the UND Human Spaceflight Laboratory, please visit our website at <http://human.space.edu>.

Students and UND Space Suit Take a Trip to "Mars"

There is little point in going all the way to the moon and Mars if you cannot protect the rocks collected from contamination.

That's why graduate students and faculty from the UND Human Spaceflight Laboratory (HSL) will be testing procedures for protecting these "samples" at a Mars analog site starting February 5.

HSL Director Pablo de León, with Masters of Space Studies students Annie Wargetz and Tim Holland, will spend a week at the Mars Desert Research Station (MDRS), a

famous simulated Martian exploration habitat in South Utah owned and operated by The Mars Society.

"For us, it's also useful because we learn more about operations in a very remote place," de León says.

"We have to be very careful and logistically organized to bring with us all the things we will need out there. If something breaks down, we need to fix it with the tools we have on hand."

Living and working on MDRS not only provides training in proce-

dures, but also lets students work hand-in-hand with seasoned space professionals from NASA Ames Center.

Teamwork in challenging environments is an integral part of space exploration and will be valuable experience for the participating students, who will receive financial support from the North Dakota Space Grant Consortium for the trip.

The team from UND will bring the North Dakota Experimental-1 (NDX-1) Mars Prototype space suit for testing. This is the first planetary



space suit built at the university level. It has been tested in the North Dakota Badlands, Marambio Base in Antarctica, and the Pilbara region in Australia.

"The complexity [of testing the space suit] in a remote place, such as the MDRS, due to the logistics involved, helps us to imagine the complexities of an "out of Earth" expedition," says de León.

For updates on the testing, please visit <http://spacesuitlab.blogspot.com>.

"The best part of working in the Human Spaceflight Lab is following the design process from paper to final project. It's a unique opportunity that is not offered in many places to students, especially when working with human spaceflight projects."

-Tim Holland
UND HSL student

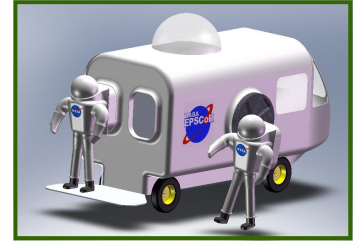
Mission Status: Planetary Exploration Initiative

One of the main projects currently under construction at the UND Human Spaceflight Lab is the North Dakota Planetary Exploration Initiative. The Initiative is a project in which an autonomous planetary base (for lunar and Martian missions) is being built as five separate components: an inflatable habitat, pressurized electric rover (PER), space suits, space suit ports connecting the suits to the rover, and a docking mechanism linking the rover to the habitat.

When all components are combined, the space suits will be docked to the rover which will be docked to the habitat. All three main components will be kept at the same atmospheric pressure and composition, to prove that the concept of interconnected components will work on an extra-planetary surface.

Currently, the habitat has the walls along the main length installed with paneling attached. The floor has also now been installed.

Recently, the rover was fitted with a light bar, which will allow for night time operation as well as a reverse assistance camera and an antenna for the main radio. The camera provides a



view of what is behind the rover while it is backing up. The view is presented on a monitor, which is mounted on the dashboard where the driver can see it.

The suit port design is in the process of being finalized, with minor adjustments being the only obstacles to completion. The adjustments are needed to accommodate the machining process. The fabrication is expected to begin within a week or two at the time this newsletter went to press. The suit port is being fabricated in coordination with the North Dakota State College of Science.

The docking tunnel and mechanism have recently started being fabricated, as the major components are now being integrated.



Above: The habitat arrives at Clifford Hall. Middle: The habitat with walls and floor installed. At Right: The rover on a test drive. Upper Right: Artist's concept of rover with attached space suits.



Website screenshot for UND Aerospace Human Spaceflight Laboratory. Includes navigation menu (HOME, PRODUCTS, PEOPLE, PHOTOS, VIDEOS, RESEARCH, SELECTIONS, EDUCATION, CONTACT), a 'Welcome' message, and a 'Mission' section listing goals like developing the base and supporting research.

Website Re-Design and Social Networking

Our website was recently re-designed and updated with much more information. This work was completed by graduate students Annie Wargetz and Brad Schanche. New pictures have been added along with a more in-depth look at the work going on at the UND Human Spaceflight Laboratory.

at <http://human.space.edu>. Check out our photos, read more about our projects, or take a peek at who is on our team.

In the coming months, watch for us on Facebook and Twitter. We will announce our profile names in this newsletter and on our website. Stay tuned!!!

Take a moment to visit us online

Next Month...

In our next issue, we will give a report from the MDRS testing, update you on our projects, and much more....