



# MARTIAN BIDESIGN

by Northwestern

## PROGRESS UPDATE

November 1, 2018

With the academic year in full swing, our team is making significant progress across all areas. Most importantly, the multi-axis robot has been delivered and installed. We now wait patiently for Facilities to finish completion of the infrastructure around the robot, specifically the enclosure that is necessary for safety while working with sulfur fumes. We have also begun running simulations of printing procedure for the robot. This means that we are able to test the theoretical motion of the 6-axis robot arm as well as the procedure for refilling the robot as we print material for the structure.

The habitat design team in collaboration with SOM have decided to take a significantly new approach to the existing model. We recognized the need to utilize all of the available floor space, but still needed to incorporate essential mechanical, electrical, and plumbing systems into the total volume of the model. Ultimately our solution eliminated two problems in one. We edited the existing foundation model to allow for a crawl-space like volume to exist underneath the main floor. This meant that we were able to save all available floor space for furniture and storage while allowing the sub-level to be completely devoted to necessary systems.

With regards to 3D printing and materials design, we have shifted our focus and resources to successfully demonstrating the capability of autonomously printing. We have not been able to work with sulfur as we await the final touches on the robot enclosure; however, we are currently working on adjusting the existing 3D concrete printer that we have to print simple samples and structures. Again, these will be necessary in order for our team to continue competing, but at the same time we are able to learn about the trial and error processes that will apply to our sulfur extruder and large-scale printer.