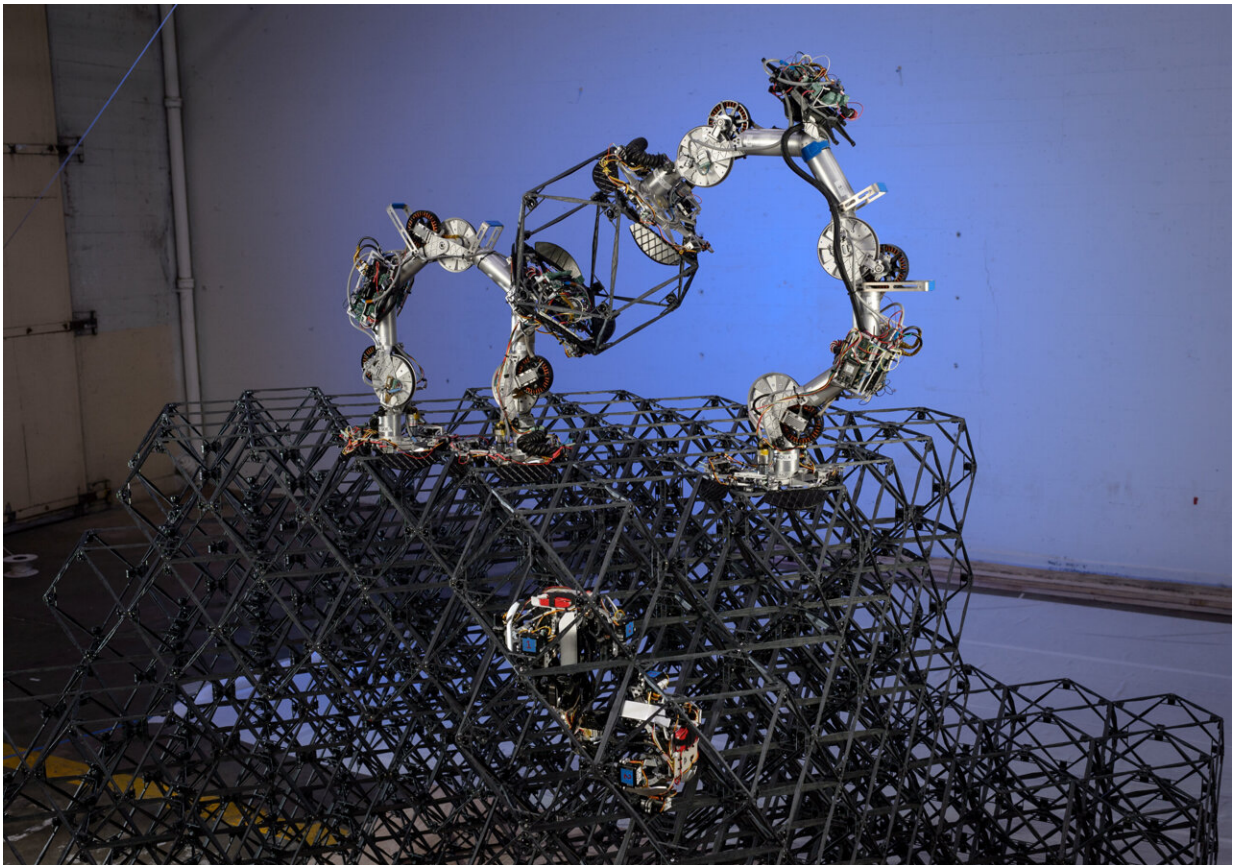


Robots that can autonomously build structures out of lattice blocks

January 18 2024, by Bob Yirka



System overview. Credit: NASA

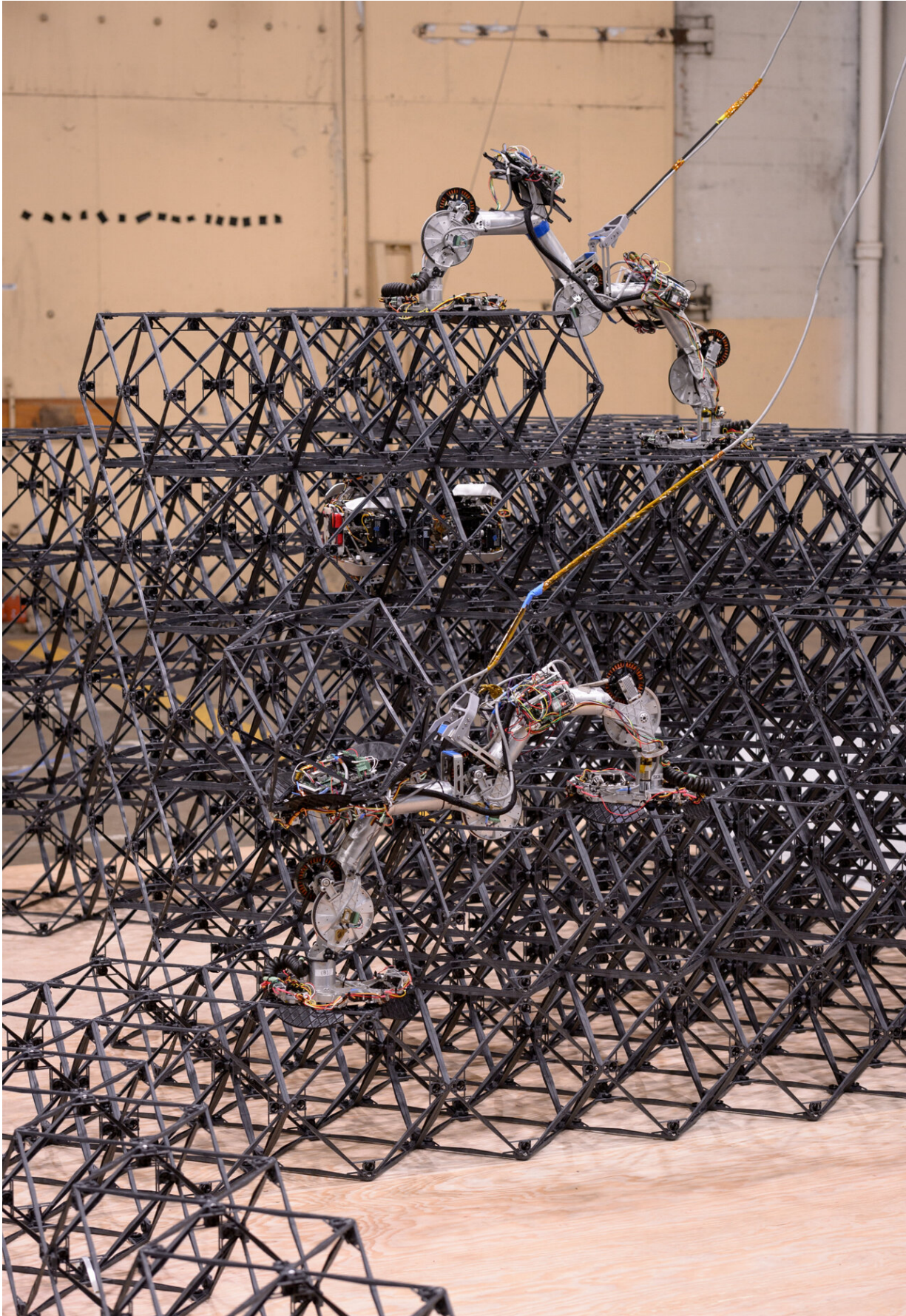
A combined team of engineers from NASA Ames Research Center and KBR has designed and built a robot system that can autonomously build

structures using specially designed lattice blocks. In their paper [published](#) in the journal *Science Robotics*, the group describes the robots and the lattice blocks they use to build structures and how they whole system works.

As NASA and other entities consider the possibility of sending humans to the [moon](#) and possibly to other planets, they must also consider the means by which they will be sheltered. Ideally, robots could be sent to desired destinations prior to the arrival of humans to build such structures. In this new study, the research team developed a type of robotic system that is capable of autonomously building such desired structures.

The system comprises three robots, two that transport lattice blocks and one that connects them. The lattice blocks are hollow, with edges reminiscent of coat hanger wire. All three of the robots can latch onto any block—two robots pick up the blocks from a given location and bring them to the [construction site](#). In addition to picking up, carrying and placing blocks, the transport robots can hand blocks to one another.

The third [robot](#) is positioned inside of the structure as it grows, allowing it to connect the blocks placed by the transport robots. The blocks are connected via twist connectors reminiscent of those used to connect Ikea furniture parts. The three robots work together, like ants in a colony, to build a structure designed by the researchers—or in the future, perhaps, by astronauts.



System overview. Credit: NASA

The research team has already tested the system by having it build several structures—in one example, they built a shelter from 256 blocks, a feat that took the system 4.2 continuous days. They suggest a system similar to theirs could be sent to the moon or beyond to build structures, towers or other facilities prior to the arrival of astronauts. In its current design, the astronauts would have to apply a covering of some type over the outer blocks, but that could likely be automated, as well.

More information: Christine E. Gregg et al, Ultralight, strong, and self-reprogrammable mechanical metamaterials, *Science Robotics* (2024). DOI: [10.1126/scirobotics.adi2746](https://doi.org/10.1126/scirobotics.adi2746)

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