

APPLIED SCIENCE

ROBO-CLIMBER

ROBOTS MAY SOON SCALE MOUNTAINS ON MARS—AND COULD SOMEDAY RESCUE YOU.

He flashes 5.13. He free-climbs at altitude in complete darkness. He eschews gloves in sub-zero cold. Conrad Anker? Chris Sharma? None of the above. Meet LEMUR, the rock-climbing robot.

Developed by scientists at Stanford and NASA's Jet Propulsion Laboratory (JPL), LEMUR is the first robot designed to ascend jagged, uneven surfaces—a feat that's poised to take planetary exploration to the next level. When complete, it will do what Mars rovers cannot: gather critical geological data from the red planet's 82,020-foot Olympus Mons, the highest volcano in the solar system.

At present, LEMUR (Limbed Excursion Mobile Utility Robot) is more crab than Caldwell. With four triple-jointed limbs, it can ascend a 5.0 route on Stanford's climbing wall, but it'll be 2 to 3 years before LEMUR is sophisticated enough to tackle the cracks and overhangs of real rock.

"Climbing is enormously complex," explains Brett Kennedy, a senior engineer at JPL. He relies on Stanford engineer and climber Tim Brett to break down that complexity and recreate it as computer programs that will teach LEMUR to free climb. "Eventually, we will build cams, hooks, and chocks into the robot's hands," says Kennedy, describing equipment that will help future generations to feel for holds and prevent falls on the way to the summit.

LEMUR's progeny could join your local search-and-rescue team in the next decade. "Robots are good for anything that's dirty, dangerous, or dull," says Kennedy, "and back-country rescue is dangerous." He sees the robots traveling to hard-to-reach places while leaving the analysis and decision-making in the hands of rescuers.

Anne Sasso

LEMUR free-solos a 5.0 route at Stanford.

