

# stress

R E L I E F



Researchers developed 3D structures out of liquid metal. Courtesy of Michael Dickey.

## Connecting the drops with 3D printing

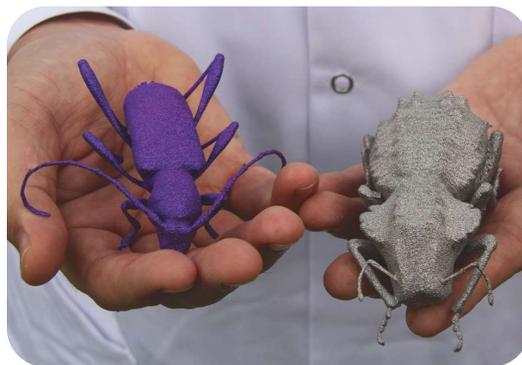
Researchers from North Carolina State University, Raleigh, developed 3D printing technology and techniques to create freestanding structures made of liquid metal at room temperature. "It's difficult to create structures out of liquids, because liquids want to bead up. But we've found that a liquid metal alloy of gallium and indium reacts to the oxygen in the air at room temperature to form a 'skin' that allows the liquid metal structures to retain their shapes," says Dr. Michael Dickey, an assistant professor of chemical and biomolecular engineering. [www.ncsu.edu](http://www.ncsu.edu).

NovaCopy 3D printed a new webbed foot for Buttercup, based on photos of his sister Minnie's left foot. Courtesy of Mike Carey.



## 3D big bugs reveal insect anatomy

Minute insects, from the Australian National Insect Collection, were super-sized up to 40 × using a novel 3D scanning system and then printed using a sophisticated 3D printer. These tools enable entomologists to physically handle the insects and study their features up close. To create the big bugs, scientists scan the insects to generate a CAD file, which is entered into the 3D printing machine. The printer adds layer upon layer of titanium to build up each bug. Up to 12 bugs can be produced at a time and after 10 hours in the machine, immense insects emerge from the titanium powder. [www.csiro.au](http://www.csiro.au).



Scientists printed giant titanium 3D bugs, a first for additive manufacturing.

## Reinventing the wheel

Shark Wheels are not circular or square—they are made of three strips each, which create a helical shape when they roll, and form a sine wave pattern. When wheels make contact with the ground, good things happen—the user gains speed, a better grip, and a smoother ride, according to inventor David Patrick. He says the wheel concept began while fashioning a cube made of different parts when he accidentally dropped it. When it hit the ground, it rolled and kept on going no matter what the terrain. He and his team set to work modeling the design, testing wheel performance in different conditions and with focus groups of experienced riders, and molding a final design in industry-standard urethane. The sine wave pattern is said to support better lateral grip. The team says the wheels perform well in rain and gravel. <http://sharkwheel.com>.



Shark Wheel is a high/low friction wheel designed to offer superior traction and high-speed stability.

## Lucky duck gets 3D printed foot

Buttercup the duckling was born with a bad foot—his left flipper bent backwards and faced the wrong way. When his caregivers discovered he had trouble walking, they decided to suit him up with a replacement. The 3D-printed foot was designed by Mike Carey with help from NovaCopy, Irving, Tex. The foot took 13 hours to print. The only way to create a

foot for Buttercup was to "scan Buttercup's sister's foot and turn that into a 3D model and print it out," explains Melissa Ragsdale, president of 3D printing services at NovaCopy. Buttercup's bad foot was surgically removed in February. Now that his stump is fully healed, a webbed plastic foot fits over his "knee" so he can walk or swim just like any other two-footed duck, says Ragsdale. [www.novacopy.com](http://www.novacopy.com).

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