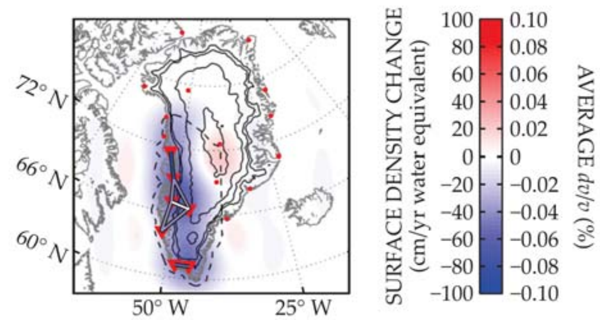
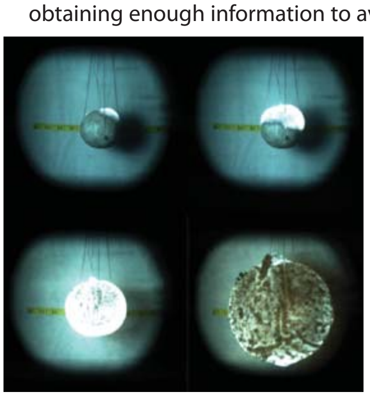


travel. The scientists reasoned that the seasonal loading and unloading of the annual snowpack would repeatedly close and reopen pores and cracks in the rock beneath it. By cross correlating the signals from select pairs of seismometers (red inverted triangles) in western Greenland between 2012 and 2014, they retrieved a continuous record of the waves propagating between the sensors. A comparison of each daily correlation function to a reference standard yielded the relative seismic-velocity changes (dv/v) from season to season; those results, averaged over the summer of 2012, are shown on the map as connecting lines against the blue background of GRACE data. The team then developed a poroelastic model to infer the volume of ice lost or gained. Reassuringly, the model results agree with those taken by GRACE to within 91% accuracy. (A. Mordret et al., *Sci. Adv.* **2**, e1501538, 2016.) —RMW

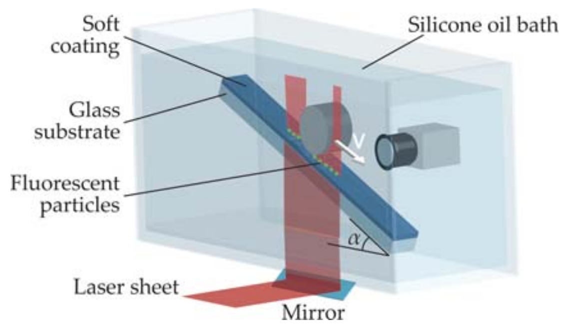
GETTING UP CLOSE AND PERSONAL WITH MILITARY EXPLOSIVES

Plenty of people have been lured into science after watching an explosion or perhaps blowing up something themselves. US Army chemists routinely perform both those activities in an effort to determine how to trigger more effective explosions and to protect soldiers from unexpected blasts. The challenge is to analyze explosions up close, preferably within a few meters, while obtaining enough information to avoid the costly task of repeating the test detonation multiple times. Kevin McNesby, from the US Army Research Laboratory at Aberdeen Proving Ground in Maryland, and his colleagues have developed a multisensor apparatus that can simultaneously probe the temperature, pressure, chemical species, and energy deposition of an explosion. During detonations of subkilogram samples of TNT and C-4, a spectrometer paired with cameras shooting at up to 40 000 frames per second mapped the temperature of the expanding fireballs and tracked the corresponding shock waves. Rapid bursts of bright 510 nm laser light enabled cameras to peek inside the comparatively dark fireballs; the researchers exploited the technique to determine that an unlucky manikin placed 2 m from the detonation of 600 g of pentolite experienced 25 psi of overpressure, which is usually fatal to humans. Crucially, images such as the ones here reveal that despite engineers' best efforts, explosions always exhibit some degree of asymmetry, which affects how energy is released. Information-rich diagnostic tests by McNesby and others could help military engineers develop explosive devices that emit immediate, more evenly distributed bursts of energy. (K. L. McNesby et al., *Rev. Sci. Instrum.* **87**, 051301, 2016.) —AG



SOFT SURFACES LIFT HARD OBJECTS

Two decades ago theorists began to investigate how objects move through viscous fluids when pulled close to a soft, springy surface. They predicted that objects would experience a counterintuitive lift force, even at low speeds. One of those theorists, L. Mahadevan of Harvard University, recently joined Baudouin Saintyves, Theo Jules, and Thomas Salez in devising and running an experiment to test that and other predictions. Depicted here, their setup consists of a glass tank filled with silicone oil. Inside the tank is the test surface: an inclined pane of glass coated with a layer of soft polymer that is embedded with fluorescent particles. When the test object, an aluminum cylinder, rolls or slides down the layer, the combination of a sheet of laser light and a video camera monitors the cylinder's motion and the layer's response. As the cylinder moves, it's expected to push down on the soft layer in front of it and pull back on the layer behind it. The resulting asymmetric pressure distribution should exert a net upward force on the cylinder. The asymmetric deformation was indeed observed, as was the emergence of a low-friction, self-sustained motion of the object at constant speed, consistent with predictions. Mahadevan and his colleagues intend to apply their newfound understanding to cartilaginous joints, the flow of soft particles, and other soft-matter settings. (B. Saintyves et al., *Proc. Natl. Acad. Sci. USA* **113**, 5847, 2016.) —CD



HOW THE BACTERIUM *PSEUDOMONAS SYRINGAE* INDUCES WATER TO CRYSTALLIZE

Ice-nucleating bacteria can catalyze ice formation in supercooled water stored in plant tissue. That ability enables them to rupture plant cell walls and release the nutrients the plants contain. Bacterial catalysis also provokes water in clouds to freeze; ice-nucleating bacteria may thus have a significant impact on weather and climate. Invoking molecular simulations, scientists conjectured that the surface of a bacterial protein organizes the liquid near it to promote crystallization. That hypothesis has now received experimental confirmation in work led by Tobias Weidner at the Max Planck Institute for Polymer Research. Weidner and colleagues studied the bacterium *Pseudomonas syringae*, whose ice-nucleating protein is called inaZ. They used sum-frequency generation (SFG) spectroscopy, in which IR and visible laser pulses aimed at an interface return a strong signal only if the interface is