

High-speed imaging of volcanic eruptions

Compared with most other volcanic eruptions, so-called Strombolian eruptions are rather mild. Named for their prototype, Italy's Stromboli volcano, they are the most frequent but least violent type of explosive volcanic activity on Earth. Driven by large pockets of pressurized gases that rise through the magma and burst at the surface, the seconds-long explosions can occur several times an hour and spew ash and plastically deforming, football- to car-sized bombs to heights reaching hundreds of meters. (See *PHYSICS TODAY*, September 2007, page 20.)

Armed with high-speed cameras that record the eruptions at 500 frames per second, Jacopo Taddeucci of Italy's National Institute of Geophysics and Volcanology and his colleagues have captured the Strombolian explosive activity of Mount Yasur, a volcano on the island of Tanna in the Oceanian country of Vanuatu. In the frame shown here, volcanic ash behind the bombs fills the 15-meter-wide field of view. The researchers have used such videos to study the physics of bomb ejection from volcanic eruptions. They found that even in the smallest of explosive eruptions, bombs may have speeds approaching 500 m/s and decelerate at up to 10^5 m/s² while traveling in a supersonic jet. The study's implications range from volcanic hazard mitigation to planetary volcanism. (See J. Taddeucci et al., *Geophys. Res. Lett.* **42**, 6253, 2015, and references therein. Image submitted by Jacopo Taddeucci.)

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