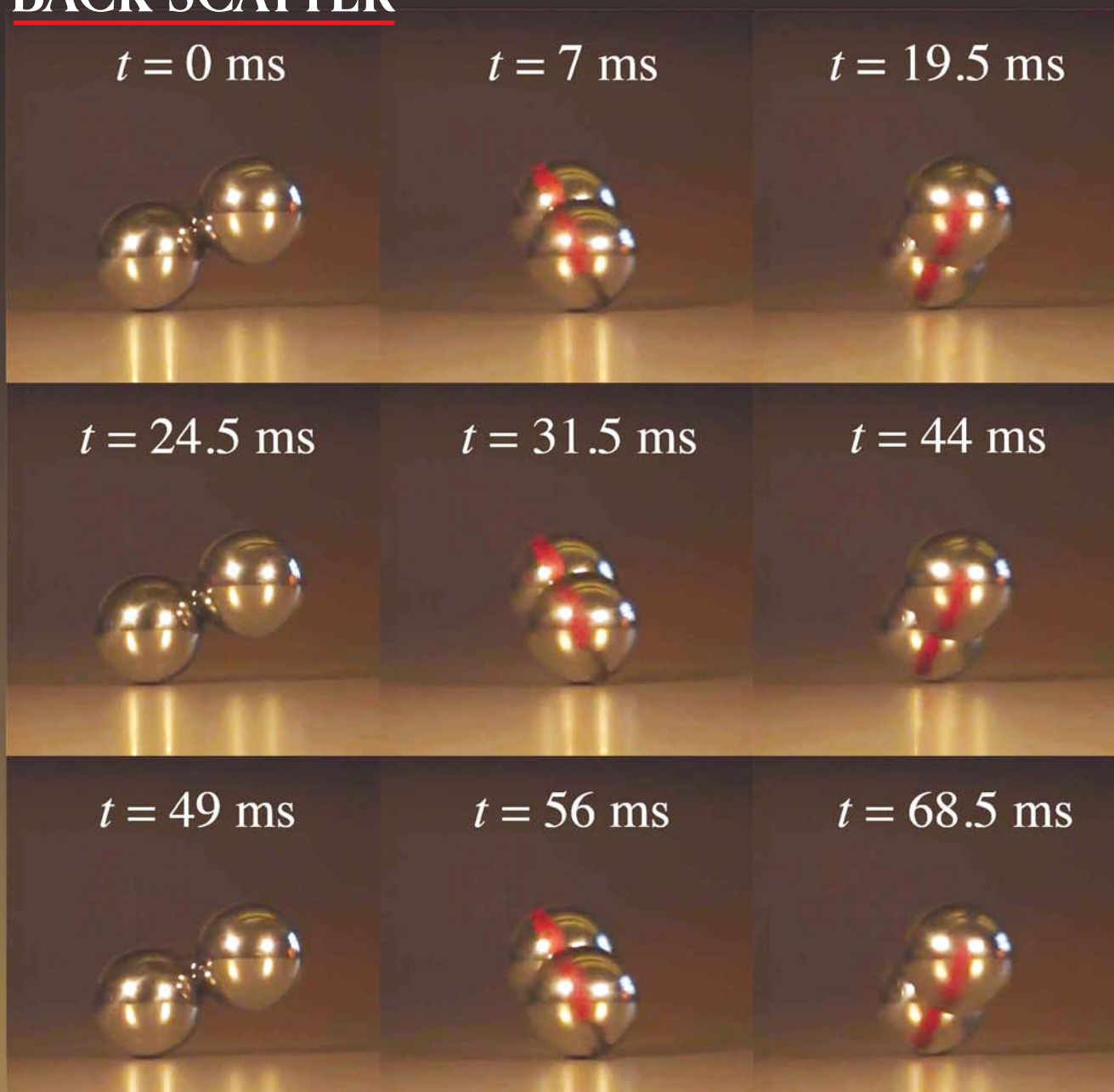


BACK SCATTER



The spinning double sphere

When two steel balls are glued together and spun on a flat surface, one ball inevitably rises above the other and the pair spins like a top with a fixed center of mass. Popularly known as hurricane balls, a spinning double sphere can easily be driven to rotation rates of more than 5000 rpm. Moreover, because it rolls without slipping, there is very little friction, so the system will remain whizzing around for several minutes. The resulting motion is quite captivating. (For the dynamics of another intriguing spinning system, see the Quick Study on page 70.)

As the double-sphere system spins about its axis of symmetry, it also precesses about the vertical axis. Interestingly, due to the system geometry, the spin and precession rates perfectly match, as demonstrated

in the time-lapse sequence shown here. A team of researchers at Dickinson College spun up this double sphere to 2449 rpm using jets of air and filmed it at 2000 frames per second (see the video at <http://dx.doi.org/10.1119/1.4930087.2>). Every 24.5 ms, the system precesses one full circle and, as the red line painted on the spheres shows, spins once around its symmetry axis, all the while maintaining a fixed inclination.

Readily analyzed theoretically and observed experimentally, the system is an ideal candidate for inclusion in an undergraduate course in classical mechanics. (D. P. Jackson, D. Mertens, B. J. Pearson, *Am. J. Phys.* **83**, 959, 2015; submitted by David Jackson.)

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