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• Collisions between new Nissan automobiles built to U.S. and Mexican safety standards

http://npr.org/sections/goatsandsoda/2016/11/20/502346360/
http://tinyurl.com/WS-NissansCollide
http://wired.com/2016/11/watch-happens-cars-mexico-us-collide-head/
http://en.wikipedia.org/wiki/Crumple_zone
http://tinyurl.com/SW-Smartcar

The Insurance Institute for Highway Safety (IIHS) collided the least expensive Nissan sedans sold in the United States (an IIHS "good" rated Versa) and Mexico (a Latin NCAP "zero star" rated Tsuru). The rather horrifying video shows a collapsed driver/passenger cabin and squished test dummy in the Tsuru (a ubiquitous taxicab in Mexico) and an uncollapsed cabin (or safety cell) with deployed airbags for the Versa. Clearly this video supports stricter safety standards for automobile design and construction. Rhett Allain, author of *Wired* magazine's "dotphysics" column presented a video analysis of the accelerations experienced by these vehicles. The Tsuru center of mass experiences lower acceleration during the collision due to that vehicle's driver/passenger cabin collapse, though the dummy itself is dismayingly crushed within the collapsed cabin. The Versa safety cell has a larger acceleration than the Tsuru, but the dummy's acceleration is further slowed by an airbag deployment within the cell. Mercedes-Benz Smart Car designs notoriously exploit safety cells and airbags. Please drive safe.

• Jumping out of windows with fire extinguishers on TV's MacGyver

http://wired.com/2016/10/physics-says-macguyvers-body-bag-freefall-cushion-work/

Speaking of Allain, he is now advising the "MacGyver" TV show, famous for the titular hero's improvised physics and engineering escapes. Check out MacGyver's recent leap from the fourth story of a burning building onto an extinguisher-inflated bodybag escape, with analysis. Rhett's gig beats normal work for sure.

• Bouncing droplets, pilot waves, the double-slit experiment, and deBroglie-Bohm theory

http://hyperphysics.phy-astr.gsu.edu/hbase/electric/watcir.html#c1
http://en.wikipedia.org/wiki/Pilot_wave
http://en.wikipedia.org/wiki/Interpretations_of_quantum_mechanics
http://tinyurl.com/WS-QMoil
http://dualwalkers.com/
http://math.mit.edu/~bush/?page_id=484
http://tinyurl.com/WS-dropsSED
http://physicscentral.com/explore/sots/
http://tinyurl.com/WS-PGantibubbles

I'm a huge fan of learning and teaching via visible analogies—analyzing mappings, evaluating commonalities and differences, reflecting on similar and divergent behaviors, and playing with the limits, domain, and ranges of visible models to learn about less visible and possibly partially related phenomena and systems. For instance I regularly use things like building and analyzing physical water circuits with my students in introductory electricity and magnetism. I had heard rumblings about "pilot wave" models of quantum mechanics but had never investigated the same, although I do regularly teach about Young's double-slit experiment and wave analysis in my classes.

Hence I was thrilled to see "Is this what Quantum Mechanics Looks Like?" a Veritasium video from Derek Muller showing a fascinating series of high-speed videos of macroscopic fluid mechanical interactions of bouncing silicon oil droplets with bounce-generated waves on vibrating Si oil surfaces that have been studied for over 10 years now. The hydrodynamic behavior of these macroscopic droplets partially replicates models and observations of quantum corral standing waves, double-slit interference, some crystalline structures and vibrations, and attractive and repulsive behavior in a series of videos from Muller, Yves Couder (Univ. Paris Diderot) and Emmanuel Fort (ESPCI Paris), John Bush (MIT), and a growing number of online amateur science and art aficionados. The videos on Si droplets reprising double-slit interference seem particularly interesting for discussion and reflection.

These drops of oil on oil surfaces are actually not so unique—close observation reveals many cases where water drops do similar things on water surfaces – e.g., Smarter Every Day episode 160 "The Walking Water Mystery" is dedicated to imaging and experimenting with the mechanics of droplets on vibrating surfaces. The SED episode 160 video looks at the same effect in Earth's gravitational field and on the International Space Station (by Don Petit of APS "Science Off The Sphere" fame). A related video by Physics Girl also examines these droplets on the surface of milk, leading to "antibubbles" wherein the droplets with an entrained air shell are submerged without coalescing. This stuff is far too neat—take some time to watch, enjoy, and ponder some of these videos, and rekindle your joy in observing and figuring things out.