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websights

WebSights *features announcements and reviews of select sites of interest to physics teachers. All sites are copyrighted by their authors. This column is available as a web page at PhysicsEd.BuffaloState.Edu/pubs/WebSights/. If you have successfully used a physics website that you feel is outstanding and appropriate for* WebSights, *please email me the URL and describe how you use it to teach or learn physics—macisadl@buffalostate.edu.*

• *Call to Sign a Petition on Executive Order 13950*

https://www.eo13950-apspetition.com/

A petition calling on the American Physical Society (APS) to take further action against a U.S. presidential executive order that harms diversity efforts at universities, national laboratories, and other institutions is making the rounds. Consider signing it; you don't have to be a member of APS to sign.

Posted widely throughout the U.S. online physics education community.

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• *Slow-Moving Waves in Giant Hanging Loops From Bruce Yeany's Science Projects*

https://tinyurl.com/YeanyRope
https://www.youtube.com/user/YeanyScience

We reported Yeany's excellent channel in the past, but rediscovered his homemade apparatus for home science projects in these pandemic times. My "Waves and Optics for Teachers" course students were impressed with his slow-moving waves in giant spinning loops series. By vertically hanging a rope or chain over a spinning pulley and making transverse waves or pulses traveling against the direction of rope movement, Yeany makes pulses and waves move stunningly slowly and they are quite artistically entertaining to watch.

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• *LASER Classroom Anamorphic Art Activities*

https://tinyurl.com/WS-OSAnamorph
https://www.osa.org/en-us/media_library/searchresults-video/?Id=6186764425001

The LASER Classroom and the Optical Society of America are doing a nice job of optical outreach with their new optics immersion series for homebound grade-school children. Their first release combining art and science is a collection of freely downloadable anamorphic art coloring and drawing activities with a related explanatory video discussing the law of reflection hosted by Dr. Claire McLellan. The anamorphs can be viewed using inexpensive mylar purchased from the LASER Classroom, or available from craft stores or Amazon online.

Submitted by Colette DeHarpporte, LASER Classroom, www.laserclassroom.com

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• *Algodoo Physics Modeling Game http://www.algodoo.com/*

https://en.wikipedia.org/wiki/Algodoo
https://www.researchgate.net/publication/346398251
https://www.physicscurriculum.com/interactivephysics
https://www.youtube.com/user/Algoryx/playlists
http://www.algodoo.com/algobox/details.php?id=228745

My attention was recently called to Emil Ernerfeldt's 2D physics modeling game Algodoo via Elias Euler's recent PER dissertation "Learning Physics with Controllable Worlds…." I have been an avid fan and user of such software in the past (e.g., diSessa's Boxer and White's ThinkerTools microworld pubs) and was a huge user of Interactive Physics in the days when it was a cross-platform package, particularly admiring animated free-body diagrams and object velocity vectors during projectile motion, and the use of real-time running graphs of momentum, energy, etc. Algodoo is a freeware package for Mac and PC, or $5 on iOS, and an online community of artists, gamers, and teachers exists mostly making Rube Goldberg-style animated machines for fun. German physics and STEM teacher preparation courses use it, and my colleague Florian Genz writes:

"Algodoo allows learners to visualize force, momentum and velocity vectors in real-time while they play around with (self-created) experiments in 2D. Different materials (e.g. Wood, Metal, Water, Ice, Helium,…), tools (springs, levers, gearwheels, thrusters,..) and gauges (trackers, lasers, …) motivate learners to build their own worlds, chain reactions and mental models about it. We found it an excellent tool for facilitating discussion in student groups. Algodoo virtual experiments allow our students to rapidly build mental models without lab equipment. The software also forces them to compromise on ONE hypothesis which they test in their microworld.

"Algodoo is a spin-off from professional engineering simulations using the 'AGX Dynamics' physics engine. Similar to ***GeoGebra,*** Algodoo comes with an active community as well as a lot of example projects and lessons."

Submitted by F. Genz, Institut für Physikdidaktik and ZuS at University of Cologne

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• *Spiders at 80 to 130 g: Kinematic Video Analysis of Slingshot Spiders*

https://www.the-scientist.com/notebook/slingshot-spiders-pull-more-gs-than-cheetahs-68097 (free summary)
https://www.cell.com/current-biology/fulltext/S0960-9822(20)30928-3 (paywall full article)
https://www.pnas.org/content/116/24/12060 (second, fully open article with video clips)

"I just became aware of some fascinating applications of the same sort of kinematic analysis students might do in a basic kinematics lab. Several species of spider use external energy storage in silk fibers to produce startling accelerations (especially startling to their prey). These behaviors are being studied using kinematic analysis of high-speed video."

Posted by Dave Smith of Allentown, PA, to the ASU Modeling Physics list Modeling@lists.asu.edu

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