

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.

• **Standardized exams don't seem to help the field of physics at the PhD level either: Typical physics PhD admissions criteria limit access to underrepresented groups but fail to predict doctoral completion**

advances.sciencemag.org/content/5/1/eaat7550

This AAAS “Science Advances” published study by Miller, Zwickl, Posselt, Silvestrini, & Hodapp of graduating PhD physicists finds that the physics-specific Graduate Record Exam widely used for admissions does not significantly predict graduation (earning the PhD). Further, setting cutoff admission scores using the GRE-P discriminates against admissions of underrepresented population (female, Hispanic, and Black) candidates. The study explicitly states, “Continued overreliance on metrics that do not predict PhD completion but have large gaps based on demographics works against both the fairness of admissions practices and the health of physics as a discipline.”

So poor policy decisions on standardized test cutoffs aren't just for K-12 students, or teacher preparation candidates.

—Manuscript release posted on LinkedIn.

• **“Rainbows: Figuring Their Angles” from Ken Ford's Essays on Physics**

basic-physics.com/rainbows

Ken Ford's short essay discussing the geometry for viewing angles of the first through fourth order of rainbows (without calculus). He writes, “In this essay I deal with some matters that have been covered elsewhere, notably finding rainbow angles for all rainbow orders. The essay's novelty may be in its treatment of the relative intensities of light in the primary rainbow arc itself and in the broadly illuminated region below the rainbow arc. I show a graphical, non-calculus way to do this. It may surprise students, and even some teachers, that water droplets send more light to the eye from the region below the rainbow than from the rainbow itself.” — Submitted by Ken Ford.

• **The National Academies releases five webinar series on English Learners in STEM Subjects: Transforming Classrooms, Schools, and Lives**

vimeo.com/album/5623390

nap.edu/catalog/25182

vimeo.com/academies

The December 2018 issue of this column described the release by the U.S. National Academies of Sciences, Engineering, and Medicine Board on Science Education of their free report on

English Learners in STEM Subjects, edited by Francis and Stephens. Since that time, the NAS has developed a series of five webinars targeting pre-K through 12th-grade STEM teachers, each just over an hour long. I particularly enjoyed the third webinar on “Instructional Strategies and Assessment.” These webinars (recorded .PPT slide lectures with questions) are available from the Vimeo video channel of the National Academies. The Collections and Albums from the Vimeo channel are also interesting if you are an aficionado of the NA.

• **Digital Sound and Music: Concepts Applications and Science**

digitalsoundandmusic.com/

Online curriculum and supplements (free, but registration is required) from an NSF CCLI (Course Curriculum and Lab Improvement) college project that has “has since evolved into a flexible body of curricular material that is designed to be accessible to students of different backgrounds, as well as teachers of a variety of courses in computer science and production aspects of music, audio, and the performing arts.” The curriculum has been tested in both CS and digital sound design classes, and includes chapters on getting ready, sound waves, acoustics, synthesis and analysis, ear testing, modeling in MATLAB and other software packages, C++ and Java, FFTs, musical sounds, sound perception, digitization, MIDI, audio processing, filtering and delays, and workflow in sound and music production. —Suggested by David Abbott.

• **Lunar meteor impact recorded during Jan. 2019 lunar eclipse**

nbcnews.com/mach/science/watch-moon-get-rocked-meteorite-during-weekend-s-lunar-eclipse-ncna961441
reddit.com/r/space/comments/ai79zy/possible_meteor_impact_on_moon_during_the_eclipse
theguardian.com/science/video/2014/feb/24/meteorite-hits-moon-lunar-impact-video

When I missed the January 2019 “Super Blood Wolf Moon Eclipse” (surely an oversell), I missed the chance to see an actual 400-kg meteor impact on the Moon at about 14-18 km/s leaving a crater about 40 m wide just before totality. The event was imaged by many in binoculars and at least five videos from around the world. Just when you're sure you have seen it all, you miss another great physics-problem-in-the-making. And it turns out this isn't a first; see the earlier video from 2014.