Dan MacIsaac, Column Editor, Physics Department,
SUNY-Buffalo State College, Buffalo, NY 14222; macisadl@buffalostate.edu

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.*

Notable physics curricula for newly assigned physics teachers

At this time of the year, queries for curricular assistance abound from teachers newly assigned to physics.

–***The Arizona State University ASU Modeling Physics Curriculum*** from modeling.asu.edu/Curriculum.html. I believe this is the gold standard for mature, research-assessed, master-teacher-refined introductory physics curricula. Activities, teacher's guides, labs, tests, answer keys, background reading, archived teacher discussion by activity, electronic support community, related research and summer workshops (some are for graduate credit) offered nationwide; see modeling.asu.edu/.

–***Teaching Physics for the First Time,*** by Jan Mader and Mary Winn. A highly recommended recent spiral-bound book from AAPT Press targeted at guiding neophyte physics teachers. Includes activities, lesson plans, labs, demos, and teacher notes from experienced high school teachers. iweb.aapt.org/iweb/Purchase/ProductDetail.aspx?Product_code=WSP-15.

–***National Repository of Online Courses***—mainly Advanced Placement and college preparatory courses and materials at www.montereyinstitute.org/nroc/nrocdemos.html.

–***Spiral Physics*** from Paul D'Alessandris of SUNY Monroe Community College at web.monroecc.edu/spiral/. Both calculus and non-calculus versions exist, offering text, workbook, problems, and tasks exploring a restricted set of principles in a spiral articulation. A research-informed curriculum I'm currently exploring with my own students. DOI: 10.1119/1.3628281

Why physics departments should stock "canned air": A simple diffusion cloud chamber by Olivia Donovan (age 15) www.youtube.com/watch?v=RVj69R66Agg

This video shows the construction and operation of a diffusion cloud chamber using a can of difluoroethane, widely sold at computer and electronics shops as a common "air duster" or "canned air" product. When leaving the can, the difluoroethane (r152a or HFC-152a) expands and cools to about -45ºC, and so can readily cool an alcohol vapor cloud into supersaturation, whereupon a moving charged particle can nucleate a visible vapor trail in a cloud chamber. This appears much more practical for homemade cloud chamber demonstrations than the well-known dry ice (solid CO_2) and Peltier junction cooled versions. Ms. Donovan's (Canadian) video also shows how to extract an americium-241 alpha source from a smoke detector (an act frowned upon in the U.S.), though natural uranium ore from www.unitednuclear.com/ also works well.

–*Ari Hämäläinen of Helsinki University Physics* has also pointed out to me that difluoroethane "canned air" is readily available, cheap, and convenient for introductory physics of sound activities as an inexpensive dense gas for filling construction paper tubes or pipes in speed of sound measurement experiments, or for filling balloons in sonic lens refraction demonstrations.

Submitted by Andromeda MacIsaac of Dalhousie Univ. Engineering, with comment by Ari Hämäläinen, Helsinki Univ.

DOI: 10.1119/1.3628282

All (4000+ titles) National Academies Press (NAP) PDF books now freely downloadable from www.nap.edu/

More than 4000 books plus future reports produced by the National Academies Press (NAP)—publisher for the U.S. National Academy of Sciences, National Academy of Engineering, Institute of Medicine, and National Research Council. Printed books continue to be available for purchase. A few notable NAP books for physics teachers (most have many related titles) now freely available:

–J.D. Bransford, A.L. Brown, and R.R. & Cocking, (Eds). ***How People Learn: Brain, Mind, Experience, and School: Expanded Edition***. www.nap.edu/catalog.php?record_id=9853.

–N.R. Augustine (2010) (Chair). ***Rising Above the Gathering Storm, Revisited: Rapidly Approaching Category 5: Condensed Version.*** www.nap.edu/catalog.php?record_id=13151. Also widely known as the Augustine report(s) and follow-up.

–National Research Council (2011). ***A Framework for K-12 Science Education: Practices, Crosscutting Concepts, and Core Ideas.*** www.nap.edu/catalog.php?record_id=13165.

This document informs the development of Next Generation Science Standards (NGSS) as part of the Common Core State Standards (CCSS) initiative for science education. Over 40 U.S. states have adopted new CCSS standards in mathematics and language arts to date www.corestandards.org/.

DOI: 10.1119/1.3628283

Angry Birds: The physics phenomenon

There are now countless media presentations and over a million Google hits on "physics teaching angry birds" due to efforts of folks like Rhett Allain, Frank Noschese, and Michael Magnusson. Basically, these authors apply video analysis methods to objects' pseudo-projectile motion taken from the invented world of the Angry Birds video game by the Finnish company Rovio. Many of the motions of these objects represent impossible, yet informative and analyzable, physics models. The game is a runaway international hit; early editions were recently provided free of charge to users of the Google Chrome browser at chrome.angrybirds.com/.

–Rhett Allain of Southeastern Louisiana University Physics seems to have started things off in his entertainingly whimsical ***dotphysics*** blog on physics, life and teaching at www.wired.com/wiredscience/2010/10/physics-of-angry-birds, analyzing the Rovio game walkthroughs.

–Frank Noschese of John Jay HS and Michael Magnuson of Canisius HS next developed student questions and activities posted in Noschese's excellent physics teaching blog ***action-reaction*** at fnoschese.wordpress.com/2011/06/16/angry-birds-in-the-physics-classroom.

DOI: 10.1119/1.3628284