



# WebSights

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This academic year, WebSights presented a selection of topical sites appropriate for teaching a standard-topic year-long introductory physics survey course, together with sites suggested by readers. Next semester's column will feature longer reviews of fewer select sites including more physics teaching strategies. All sites are copyrighted by the authors. This column is available as a clickable web page at <http://PhysicsEd.BuffaloState.Edu/pubs/WebSights/>. If you have successfully used a site to teach physics that you feel is outstanding and appropriate for WebSights, please email me the URL and describe how you use it to teach. The person submitting the best site monthly will receive a T-shirt.

## Web resources for teaching introductory modern physics

**The Mechanical Universe:** Fifty-two half-hour university physics lessons streamed as video-on-demand free of charge. Eight episodes are devoted to modern physics: four to relativity (programs 41-44) and four to atomic physics, particle physics, and the quantum revolution (programs 49-52). Programs make strong reliance on the history of these topics and require free registration. <http://www.learner.org/resources/series42.html>.

**Two resources for teaching introductory atomic, wave and quantum physics** that we have become quite enthusiastic about using here at Buffalo State are combining the shockwave simulations from Dean Zollman's Visual Quantum Mechanics website, <http://phys.educ.ksu.edu>, with the appropriate text chapters and especially the accompanying workbook questions from Randy Knight's text *Physics for Scientists and Engineers*, <http://www.aw-bc.com/knight>. We spend much class time white boarding and discussing workbook problems and exploring simulations.  
*Suggested by D. Beery, M. DeMarco, and D. MacIsaac.*

**An online special and general relativity** text with visualizations and animations is Rob Salgado's *The Light Cone*, <http://physics.syr.edu/courses/modules/LIGHTCONE>.

**Particle physics sites** include the renowned collection of resources, posters, downloadable workbooks and activities, websites, and workshop from the CPEP folks at <http://www.cpepweb.org>: Fundamental Particles and Interactions, Nuclear Physics, Plasma Physics and Fusion, and a forthcoming Cosmology and particle physics site. A nice animation of the Rutherford experiment is found at <http://micro.magnet.fsu.edu/electromag/java>; that site also has illustrations and animations for orbital shapes and an NMR applet collection.

**Historical sites for modern physics** include the online exhibits Marie Curie and the Science of Radioactivity, Heisenberg and Uncertainty, and Einstein: Image and Impact sites, all found at the American Institute of Physics website: <http://www.aip.org/history>. See also the MacTutor collection A History of Quantum Mechanics: [http://www-groups.dcs.st-and.ac.uk/%7Ehistory/HistTopics/The\\_Quantum\\_age\\_begins.html#31](http://www-groups.dcs.st-and.ac.uk/%7Ehistory/HistTopics/The_Quantum_age_begins.html#31).

**Radioactivity sites** (besides the CPEP Nuclear Physics site above) include an extensive site devoted to Radiocarbon Dating, <http://www.c14dating.com/k12.html>, an applet devoted to the Natural Radioactive Series, <http://www.eserc.stonybrook.edu/ProjectJava/Radiation>, and an animated presentation on Isotopes and Radioactivity at the Physics 2000 site <http://www.colorado.edu/physics/PhysicsInitiative/Physics2000/isotopes>. The Physics 2000 site has many worthwhile modern and atomic physics sections; another favorite part of that site is dedicated to describing atomic x-ray production mechanisms: [http://www.colorado.edu/physics/PhysicsInitiative/Physics2000/xray/making\\_xrays.html](http://www.colorado.edu/physics/PhysicsInitiative/Physics2000/xray/making_xrays.html). Finally, the EPA has a worthwhile Radon reference site: <http://www.epa.gov/iaq/radon>.

## Astronomy Teaching Resources

Recently, Andrew Fraknoi of the Astronomical Society of the Pacific (<http://www.astrosociety.org>) wrote to describe a new resource for teaching astronomy to nonscience majors, <http://www.astrosociety.org/education/resources/educsites.html>. This site is dedicated to Pedagogical Content Knowledge (PCK), discussing how to effectively teach astronomy, not astronomical content. Fraknoi also called attention to recent publication of a survey of college astronomy teachers at <http://aer.noao.edu/AERArticle.php?issue=5&section=2&article=2>, in the *Astronomy Education Review*, a free online journal devoted to astronomy teaching research.  
*Suggested by A. Fraknoi.*