

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.

• **How Spiders Fly: Ballooning Spiders use E field for lift**

theatlantic.com/science/archive/2018/07/the-electric-flight-of-spiders/564437/

nytimes.com/2018/06/26/science/spiders-ballooning-wind.html
npr.org/2018/07/05/626123698/when-spiders-go-airborne-it-s-electric-literally

arxiv.org/abs/1309.4731?context=physics

In a few days I teach E&M to freshman engineering technologists, and use the classic electric field examples including lifting paper confetti with charged straws, the Millikan oil drop experiment and Volta's hailstorm. In class we also connect parallel Al foil plates to a Van de Graaff and place candles and pith balls between them. Now I shall have to go spider hunting as well. What a super cool example of animal locomotion and electric fields.

• **IceCube high energy neutrino detection establishes a new multi messenger astronomy event**

<https://www.amon.psu.edu/2018/07/12/icecube-discovers-the-first-astrophysical-source-of-high-energy-neutrinos/>

<http://science.sciencemag.org/content/361/6398/eaat1378>

<https://www.nytimes.com/2018/07/12/science/space-neutrinos-blazar.htm>

<https://aapt.scitation.org/doi/full/10.1119/1.5011848>

Another multi messenger astronomy event—this time including neutrinos has been published: The correlation of a high-energy neutrino flux event detected by the IceCube neutrino observatory experiment in Antarctica with E&M data has further characterized the flare of a known “Blazar.” In the November 2017 edition of this column we described multi messenger astronomy combining gravitational wave and E&M spectrum detectors to study the August 2018 GW170817 Binary Neutron Star merger in real time. Now, new papers and stories from July of this year describe retroactively detecting and identifying ~290TeV neutrinos in what is now called the September 2017 neutrino IceCube-170922A event. This event is associated with a gamma ray flare from a known blazar—TXS 0506+056 which was previously identified via E&M ground and satellite detectors. Blazars produce incredibly powerful relativistic jets of plasma (this extragalactic one is directed along our line of

sight) and it appears they may be responsible for PeV cosmic rays, and generate a significant fraction of the very high background cosmic ray flux.

• **Weber State Physics “Professional Library of Physics Demonstration Videos”**

weber.edu/physics/amiri_galli.html

“We have produced demonstration videos containing approximately 200 physics concepts.” These videos average about 5 minutes each and encompass almost all topics in the standard lower division physics courses. In the videos, the narrative description and explanations of the principles are purposefully kept brief to allow for faculty to provide their own complete explanations. As each of the demonstrations was produced, care was taken to ensure the quality of the videos and the accuracy of the physical principles being portrayed. Each video is accompanied by a complete list of the equipment used and a brief written explanation. These videos are available in YouTube format.

A full description of the potential uses of these videos is described in the authors' website.

Submitted by J. Ronald Galli, Professor Emeritus, Weber State University

• **UV camera physics YouTube videos**

tinyurl.com/WS-VeritasiumUV

youtube.com/user/1veritasium

tinyurl.com/WS-PGsunscreen

youtube.com/user/physicswoman

tinyurl.com/WS-IRThaller

Derek Muller's Veritasium project has produced a new video “The World in UV” together with Dianna Cowern's Physics Girl, who has produced a video of her own—“Sunscreen in UV.” The videos are striking in their portrayals of UV phenomena such as normally invisible skin damage, dental crowns and UV smog; the most visually arresting effect seems to be that applying sunscreen looks like applying shoe polish under UV. Fun was had creating UV-only visible graffiti with sunscreen, and discussing and assessing the SPF, function and pollution of different reflective and absorptive sunscreens. The new UV videos are somewhat reminiscent of Michelle Thaller's famous outstanding “Infrared: More Than Your Eyes Can See” video.