# TPT *WebSights* column draft for December 2023:

*WebSights* features announcements and reviews of select sites of interest to learners and teachers of introductory physics. This column is available as a web page at [PhysicsEd.BuffaloState.Edu/pubs/WebSights/](http://PhysicsEd.BuffaloState.Edu/pubs/WebSights/).

If you have successfully used a physics website that you feel is appropriate for *WebSights*, please email me the URL and describe how you use it to teach or learn physics. [macisadl@buffalostate.edu](mailto:macisadl@buffalostate.edu).

**2023 Nobel Prizes in Physics and Chemistry**

<https://www.nobelprize.org/all-nobel-prizes-2023/>

<https://www.nobelprize.org/prizes/physics/2023/popular-information/>

<https://www.nobelprize.org/prizes/chemistry/2023/press-release/>

<https://en.wikipedia.org/wiki/Quantum_dot_display>

<https://www.sigmaaldrich.com/US/en/products/materials-science/energy-materials/quantum-dots>

Pierre Agostinin, Ferenc Krausz and Anne L’Huillier received the 2023 Nobel Prize in physics for experimental methods with attosecond light pulses, studying electron dynamics in matter. Previously femtosecond (10-15 sec) pulsed observations were the limit, now these new techniques (using “overtones” in a gas pumped by a laser) are 1000 times faster (10-18 sec) which is essential for observing electron movement in materials underlying the basic physics of bonding and motion, semiconductor devices and basic biological processes.

Moungi G. Bawendi, Louis E. Brus and Aleksey I. Yekimov received the 2023 Nobel Prize in chemistry for their discovery and synthesis of quantum dots. Incredibly photogenic, quantum dots are crystalline particles so small that their properties are dominated by quantum phenomena – in particular tuning their size and electronic properties to color, establishing new technologies for video displays called QDLEDs. Quantum dot technology is also used in lamps, mapping biological tissue and is a strong candidate for use in many future optoelectronic devices, and the dots are commercially available items.

**National Science Board science indicators published; yes, “COVID Math” is a real thing**

<https://ncses.nsf.gov/pubs/nsb202331>

The 2022 national math assessment has captured the largest decline in scores for nine year-old grade school students in 44 years, with disproportionate drops for students of color, low income families and already disadvantaged students. The unprecedented disruptions due to the COVID-19 pandemic beginning in March 2020 has resulted in historically low scores; for another benchmark --amongst 4th and 8th graders the math achievement score regression is the worst in approximately 20 years. According to NAEP and ACT scores, STEM college readiness benchmark achievement also suffered, with many 2021 graduates reporting delayed or cancelled postsecondary plans. Internationally the US continues to rank in the middle of advanced economies, far outpaced by Japan and Singapore.

**Veritasium releases videos on Science Communication and Night Vision**

<https://tinyurl.com/WS-SciComm>

<https://tinyurl.com/WS-SHworm>

<https://en.wikipedia.org/wiki/Cold_fusion>

<https://www.youtube.com/@SabineHossenfelder>

<https://tinyurl.com/WS-NVG>

Derek Muller has released two new Veritasium videos, one about a recent science miscommunication frenzy surrounding “Nature’s” Dec 2022 cover article on a “holographic wormhole created within a quantum computer.” In the rush to sell the science and your eyeballs and web clicks, bold unsubstantiated claims are sometimes made in press releases and distortional articles. Such a hunt for publicity also drove attention paid to recent room temperature superconductivity “breakthroughs,” the DOE fusion “breakthrough” and of course the Fleischmann-Pons cold fusion claims way back in 1989. The new development seems to be that today we have the internet so overhyped scientific discovery runs on steroids, and perception strongly shapes reality. Inordinate publicity seeking attention and funding could also foster and reward scientific misconduct.

A program I regularly enjoy -- Sabine Hossenfelder’s “Science News” has had nice pieces about the recent materials science “breakthroughs” and I really appreciate her skeptical, darkly humorous comments on this sort of thing. Notably she chose not to continue the “holographic wormhole” issue in her weekly program, but in a separate video short.

A second Veritasium video on night vision devices was also released; it discusses active infra-red illumination systems, passive starlight image intensifiers (microchannel plates were developed for astronomical instrumentation), and modern passive infra-red, and multi-wavelength (far infra-red, terahertz and microwave) systems. Perhaps old hat to astronomers and soldiers, but with much footage from Putin’s invasion of Ukraine online this is technology in the news.

**Bruce Yeany’s 300mph raw egg pneumatic cannon**

<https://tinyurl.com/WS-BYcannon>

<https://www.youtube.com/@YeanyScience>

Watch Bruce Yeany shoot 300mph raw eggs through 3/4 inch plywood and marvel that we are paid to think about and do things like this. Life is good.