# TPT *WebSights* column draft for January 2025:

*WebSights* features announcements and reviews of select online resources of interest to learners and teachers of introductory physics.

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).

**CERN to offer online Particle Physics Course for HS Students**

<https://ppc.web.cern.ch/>

<https://www.symmetrymagazine.org/article/new-cern-course-teaches-particle-physics-basics-online>

Jade Tan-Holm has released another “Up and Atom” channel YouTube video, reviewing Maxwell’s Laws in integral form and reviewing fields, field lines and circulations, surface and path integrals, vector dot products, flux and so forth accompanied with a richly illustrated set of animations and static images. I wish that I had had access to these kinds of presentations as an undergraduate learner, and I will be recommending this video to my own undergraduate E&M students, who are highly motivated to learn these challenging models deeply embedded in multiple representations (complex 3D geometric figures, vector calculus notated mathematical equations and highly specialized technical vocabulary). Other master teachers explain Maxwell’s equations, notably Kathy Joseph’s nice mathematical-historical video which presents Maxwell’s equations in their differential forms, defining del, divergence, curl and Gauss’ Law. Given the complementarity of the approaches both are worth watching for students. These are half hour length videos reviewing (or introducing) much complex physics for learners and I will recommend my introductory students watch both next semester.

**2025: The International Year of Quantum Science and Technology**

<https://quantum2025.org/en/>

<https://www.aps.org/about/quantum-2025>

<https://phdcomics.com>

<https://www.aps.org/initiatives/physics-education/physicsquest>

Recognizing 100 years since the development of quantum science, the UN-proclaimed IYQST will have an opening ceremony in Paris on Feb 4, 2025. The website should be populating with local and regional activities and resources early in the year, and online channels on Facebook, Instagram, X and LinkedIn are starting up. The popular web cartoon Ph.D. Comics by Jorge Cham is affiliated with the effort, and you should expect to see Quantum-related activities at physics events everywhere. For teachers, the APS website includes Physics Quest Kits and other materials, and the Perimeter Institute.

**Mechatronics: Make your robot projects here**

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

<https://www.aliexpress.us/>

<https://www.hackster.io/news/this-goldfish-can-steer-its-own-tank-6c8b317c0e6c>

<https://tinyurl.com/WS-ESC32projects>

<https://howtomechatronics.com/>

<https://makezine.com/>

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

Mechatronics is the combination of mechanical, electrical, electronic and software engineering -- think tweaking downloaded code to install on a Raspberry Pi, Arduino or ESP32 that drives a small robot you built yourself—which is readily possible for undergraduate and gifted HS students given extensive freely downloadable hardware and software resources (usually from GitHub). Pre-Trump tariffs, Arduino Nanos and ESP32’s (ESP32’s have built-in wifi) are available under $5 from Ali Express, so an expensive kit is NOT required to start into this hobby, and my students are particularly interested. There are lots of fun creatively-oddball projects like this robot vision project that allows a goldfish in a wheel-mounted tank to explore the dry land world, or controllable toy model excavators etc. The “How to Mechatronics” site is an excellent source of tutorials and projects, as is Make: magazine and their YouTube channel.