

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/](https://www.physicsed.com/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](mailto:macisadl@buffalostate.edu).

• **Some German physics outreach sites: Physics in Advent, Physics for Refugees, and Physics for Street Children**

[www.physik-im-advent.de/about](http://www.physik-im-advent.de/about)  
[www.dpg-physik.de/pff/index.html](http://www.dpg-physik.de/pff/index.html)  
[www.epsnews.eu/2016/12/physics-for-all-a-project-to-carry-physics-into-refugee-sites/](http://www.epsnews.eu/2016/12/physics-for-all-a-project-to-carry-physics-into-refugee-sites/)  
[physik-patio13.de/en/physik-fuer-strassenkinder/](http://physik-patio13.de/en/physik-fuer-strassenkinder/)

I am taking sabbatical in Cologne, Germany, and had the opportunity to experience several of the German Physical Society's (*Deutsche Physikalische Gesellschaft* or DPG) outreach efforts. Physics in Advent (*Physik im Advent* or PiA) is a 24-day long collection of daily simple home physics and mathematical physics activities, puzzles, and experiments for the public. These Christmas-themed activities are presented via short videos in English, and there are five years' worth of them online. Herr Professor Dr. Arnulf Quadt of Georg-August-Universität Göttingen leads the PiA enterprise.

I also had the opportunity of volunteering, experiencing, and enjoying the curriculum developed for refugee schoolchildren called Physics for Refugees (*Physik für Flüchtlinge* or Pff), which are delivered as kits and guides around the country by volunteers at about 60 sites (including two in Cologne—both a refugee center and the *Gymnasium Thusneldastraße*—a high school). These Pff activities in turn were developed by a group of physics education researchers from the University of Education Heidelberg led by Frau Professor Dr. Manuela Welzel-Breuer and Dr. Elmar Breuer. Their *Physik für Straßenkinder* (Physics for Street Children) project for homeless Latin American street children using pre-service STEM teachers to deliver instruction has been running in Medellín and Copacabana, Columbia, since 2001 and is extensively documented at their patio13 website, where curricular materials are also available.

• **Philipp Wichtrup's Physikdigital site of demonstrations and activities**

[physikdigital.de](http://physikdigital.de)  
<https://tinyurl.com/WS-Conductivity>  
<https://www.multimediascienceslam.de/ideengeber/>

*Note: the Chrome browser will provide automatic translation on the fly if you are struggling with languages.*

Herr Wichtrup, a doctoral student in physics didactics at Westfälische Wilhelms-Universität Münster (Munich) has developed an extensive website keyed to the standard physics

curriculum in Northwest Rhine Westfalia, a state or province of Germany. His site includes many interesting and unknown (to me) demonstration videos, and I was particularly struck by the conductivity demonstration video above. It is also interesting to see the ubiquity of high voltage (current limited) power supplies used to demonstrate static electric phenomena in German universities and high schools.

Together with doctoral student Herr Stefan Hoffmann of physics didactics at Universität zu Köln (Cologne), Herr Wichtrup runs an annual competition called "Multimedia Science Slam" for student-created STEM (and physics) learning videos. Videos are mainly produced by future teachers attending both universities.

• **More opportunities, courses, and materials for high school students and teachers from the Perimeter Institute**

<https://tinyurl.com/WS-PI2-2-2018>  
<https://tinyurl.com/WS-PIcrses>  
<http://www.perimeterinstitute.ca/outreach>

Canada's Perimeter Institute for Theoretical Physics outreach group are again advertising wondrous opportunities for high school students and teachers to attend international camps live at PI, to take free "GoPhysics!" online enrichment courses in April 2018 ("Gravity" with relativity and the "Quantum World" for HS students), and download and use theoretical physics posters, curricular materials, and videos.

*Email from Greg Dick of Perimeter Institute outreach*

• **Stephen Hawking's 1966 dissertation available online**

<http://www.cam.ac.uk/research/news/step-inside-the-mind-of-the-young-stephen-hawking-as-his-phd-thesis-goes-online-for-first-time>  
<https://www.gizmodo.com.au/2017/10/you-can-now-read-stephen-hawkings-phd-thesis-for-free-here/>  
<http://www.imdb.com/title/tt2980516/>

As author of *A Brief History of Time*, subject of the film "The Theory of Everything" and one of the best-known living physicists in the world, Hawking's pop culture recognition is immense. Recently, Cambridge made his 120-word 1966 dissertation "Properties of Expanding Universes" available for free download, and it initially crashed their servers. The dissertation discusses gravitational radiation, singularities (regions of infinite density and zero volume) and other "implications and consequences of the expansion of the universe."