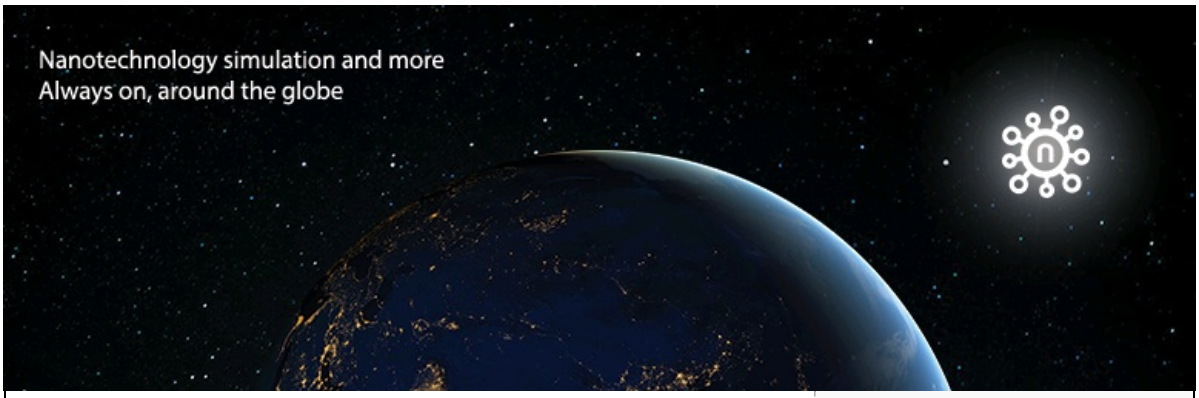


Issue 17

## Perspective: Incorporating nanoHUB in the classroom

Since its inception in 2002, nanoHUB.org has been utilized in nearly 1300 graduate and undergraduate classrooms at 185 academic institutions. With a global user community, nanoHUB's educational materials focus not only on simulation-based learning in nanotechnology, which emphasizes innovative, outcome-focused and evidence-based instruction, but also on lectures and learning materials related to cutting edge topics often not yet covered in textbooks.

Dr. Steve Polly, currently a postdoctoral researcher at the Rochester Institute of Technology (RIT), Rochester, NY, recently shared his experience using nanoHUB during his undergraduate and graduate studies. Dr. Polly received his Bachelor's degree in Microelectronic engineering and his PhD in Microsystems engineering, both from RIT. He was first introduced to nanoHUB as an undergraduate student to supplement homework exercises and continued utilizing it throughout his graduate studies. Multiple professors at RIT encourage their students to visit nanoHUB and "play" with the available simulation tools to gain a better understanding of concepts beyond what can be taught on paper or "whiteboards." nanoHUB is used as a resource in the classroom to shed light on what is happening "behind the scenes" and as a way to let the students "see the math come to life" especially in advanced mathematics courses, which are heavily theoretical.

*"I think [nanoHUB] gave another edge that you don't normally necessarily get in class. You can draw a figure, where putting X voltage across a device with Y temperature, will give you a result. You can write that down without a problem but it's hard to see [visualize] what is the effect of temperature on this device or what is the effect of voltage unless you write a MATLAB code, which can be difficult and time consuming for an undergraduate class exercise."*

While obtaining his PhD, Dr. Polly published "III-V Strain Compensation Calculator," a nanoHUB tool that calculates the required thickness of strain compensation for quantum dots or quantum wells in the III-V material system. His decision to publish on nanoHUB was determined by a colleague's publishing experience, the community's familiarity with nanoHUB, and ease of accessibility, amongst other reasons.

*"I chose nanoHUB because it was well known in the community and people are familiar with it as an entity. Having an online platform that is easily and freely accessible to anybody from anywhere in the world was a really strong reason to want to put something on nanoHUB."*

Publishing on nanoHUB permits contributors to monitor their usage metrics for each resource. These metrics include the number of users served, geographical location, organization type, number of simulation runs, among others. While Dr. Polly acknowledged that the ability for global users, from around the world, to utilize his tool was "fascinating"; he also identified another motive that encouraged him to publish on nanoHUB.

*"Another reason was that I was able to get a DOI (Digital Object Identifier) for the program. So when I write a paper, I am able to link directly to nanoHUB and to that program – which helps me cite my sources properly."*

In his current role, Dr. Polly uses nanoHUB resources to stay informed on what is going on in the field of thermoelectric devices. He recently completed "Thermoelectricity: From Atoms to Systems," a nanoHUB-U course offered by Professors Shakouri, Lundstrom, and Datta, which he found extremely useful.

*"The first few slides of presentation gave me a fundamental understanding of these devices [thermoelectric] that I was now going to work with for the next few years. Being able to take that course and go through it was really a great start to my Post Doc"*

**Have you used nanoHUB in the classroom, for an interesting educational purpose, or other unique learning opportunity? Has nanoHUB helped you advance your research or provided important professional development for your job or career? Share your nanoHUB story with us HERE.**

## Focus on Features: nanoHUB Collections

Like Pinterest for scientists, Collections are a quick and easy way to share, identify favorite items, and organize information on a hub. They can be secret or public, and you can put a collection inside another collection. When you follow someone through collections, his or her posts show up in your live feed. You can follow a user's entire collections or just the ones that interest you. You can post any image, link, or file you want to share. You can add a post by collecting content on the site or upload a file right from your computer. Any post can be reposted, and all posts link back to their source. Collections are a way for you to organize your posts by topic.

**>> Explore Collections Now**

## Announcements

New nanoHUB-U courses are open for enrollment on edX

**Nanotechnology: Fundamentals of Nanotransistors**

By Dr. Mark Lundstrom

**Principles of Electronic Biosensors**

By Dr. Ashraf Alam

## Upcoming Events

**10th Symposium on Advanced Materials Science and Nanotechnology**

**When:** December 7-9, 2015

**4th International Conference on Advanced Nanomaterial and Nanotechnology**

**When:** December 8-12, 2015

## New Resources

**Unified View of Electron and Phonon Transport (online presentation)**

**Negative Capacitance Ferroelectric Transistors: A Promising Steep Slope Device Candidate?**

**Inter-band Tunnel Transistors: Opportunities and Challenges**

**VALint: the NEEDS Verilog-A Checker (BETA)**

**Lorentzian fitting of phonon spectral energy density function (tool)**

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