



Issue 8

Experimentalists adopt a new nanoHUB tool within six months

nanoHUB brings together groups of researchers, providing shared discovery tools and knowledge resources that enable them to build upon each other's work—and, fast.



In less than six months from the day three researchers at the Penn State Center for Nanoscale Science published a new simulation tool, researchers at the University of Surrey Nanoelectronics Centre cited the tool in their new manuscript.

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Circuit designer finds the knowledge to innovate

Between filing provisional patents and working in user nanofabs, electro-optic circuit designer, entrepreneur, and nanotechnologist Jay Morreale expands his knowledge using nanoHUB.

"I've been viewing the lectures on nanoHUB to learn enough device physics to fill in the gaps for the things I don't understand in the technical papers I read," Morreale says. "I don't know where else I would find access to this kind of information, and the open access makes it very affordable for small business."

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Simulation leads to more motivated students and improved teaching and learning

The quality of teaching and learning improved in an electronic materials course when José M. de la Rosa, associate professor of electronics and electromagnetism at the University of Seville, Spain, introduced nanoHUB simulation tools and lab exercises. Students became motivated and interested in course content when using the nanoHUB platform, multimedia resources, and remote computing tools accessible through links from the course's WebCT site.

After incorporating nanoHUB for more than three years, de la Rosa authored a paper on the experience. It was published by IEEE in May in the proceedings of the IEEE Global Engineering Education Conference held in Marrakesh, Morocco, on April 17-20.



When asked about teaching and learning with nanoHUB, de la Rosa shared his views on the advantages and challenges.

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A student 'hooked' on nanoHUB: Quincy Williams

Quincy Williams, a Ph.D. student in materials science and engineering at Norfolk State University (NSU), shares how he started using nanoHUB and why he continues.

"I've used modeling and simulation tools mostly as part of a class to try to explain nanostructures. We would go to the tools to actually see a particular phenomenon. We didn't have to worry about setting up an experiment and hoping to get useable data, and we could get several kinds of data at once instead of needing to set up multiple experiments. With tools, you can get straight to what you really need to know," Williams says.

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Online courses on the fundamentals of atomic force microscopy offered

Online courses covering the fundamentals of atomic force microscopy will be offered beginning August 27, 2012, by nanoHUB-U, an initiative founded by the Network for Computational Nanotechnology and Purdue University.

Ron Reifengerger, professor of physics, and Arvind Raman, professor of mechanical engineering, have spent months packaging their full-semester course on the atomic force microscope (AFM) into a series of two five-week online courses: Fundamental Aspects of AFM, and Dynamic AFM Methods.



"We are convinced that as more researchers gain a fundamental understanding of AFM, then AFM will become more widely used and accepted," Reifengerger says. "When using an AFM, it's not always straightforward to understand the

NEW TOOLS

nanoHUB members published 20 new tools in the past three months, including:

• [Measuring Youngs Modulus](#): Measure the Youngs modulus of MEMS with comb drives by electronic probing of capacitance. Authored by Aarti Chigullapalli and Jason Clark.

• [Mobility and Resistivity Tool](#): Understand how doping affects mobility and resistivity. Authored by Ivan Santos, Stephanie Michelle Sanchez, and Stella Quiñones.

• [Equilibrium Wulff Shape Generator](#): Examine the Wulff shapes of crystals with specified symmetries. Authored by R. Edwin Garcia and John Blendell.

[More new tools](#)

RELATED SOURCES

Each nanoHUB tool has a Web page listing sources where the tool has been cited and links to papers or proceedings. The digital object identifier of a source is provided, along with buttons that give users of BibTex or EndNote automatically generated, downloadable citations. Some resource pages also provide citations of related papers.

NEW RESOURCES

In addition to 20 tools, nanoHUB members published 180 new presentations, teaching materials, articles, downloads, and resources in the past three months.

[More new resources](#)

UPCOMING EVENTS

August 7-9: The 3rd International Conference on Nanotechnology: Fundamentals and Applications (ICNFA '12) — Location: Montreal, Canada. Keynote talks, presentations, poster sessions for the international community working in nanotechnology. [Read more](#).

September 5-7: SISPAD 2012, The 17th International Conference on Simulation of Semiconductor Processes and Devices — Location: Denver, Colorado. An international forum for the presentation of research and development results, and one of the longest-running conferences devoted to technology computer-aided design (TCAD) and advanced modeling of novel semiconductor devices and nano electronic

results. You must be cautious, and it really helps to understand the limitations of the instrument."

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Workshop expands nanoHUB's reach

Twenty-five science and engineering faculty and students from nine regional historically black colleges and universities participated in a workshop held April 5-7 at Norfolk State University (NSU) to discuss how to include nanoHUB.org resources in their instruction.

Workshop participants represented Elizabeth City State University, Fayetteville State University, Hampton University, Johnson C. Smith University, Norfolk State University, North Carolina A&T, North Carolina Central University, Virginia State University, and Virginia Union University.

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System upgrades call for developers to update tools

Two recent upgrades to HUBzero® are designed to improve performance for nanoHUB users running models with larger memory requirements but will require developers to update their tools to take advantage of the enhanced capabilities of the upgraded system.

The simultaneous upgrades included the change from 32-bit to 64-bit addressing and a new version of the operating system. The new operating system brings several developer tools and utilities along with it. Foremost among these is an update to the GNU suite of compilers.

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structures. A nanoHUB tutorial will be presented at SISPAD.

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