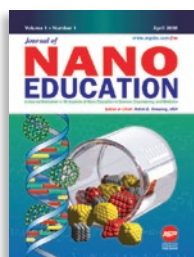


The nanoAdvisor

Educational News & Events in Nanotechnology

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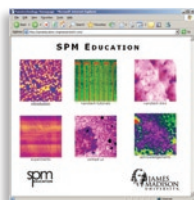


Feature Article

- **New Book and Journal Dedicated to Nano Education**

Educational Events

- **Nanoscience Seminar for Educators**
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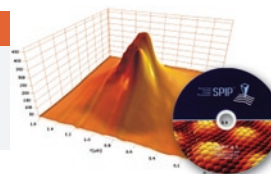


Educational Resources

- **Two New Websites Provide Valuable Resource for Nano-Education**

Educational Products

- **Educational Pricing Announced for Leading Image Analysis Software**



This newsletter is published by Nanoscience Instruments, Inc. to support the SPM and nanoscience education community. Comments and suggestions are welcome. Requests for your education program to be reviewed, guest editorials, or other comments can be made to edu@nanoscience.com.

An electronic version of this newsletter is available at nanoscience.com/education.

FEATURE ARTICLE

A Knowledge Base for NSE Education

NEW BOOK AND JOURNAL DEDICATED TO NANO EDUCATION

Knowledge base:

“(T)he systematic organization and synthesis of what currently is known in a field of inquiry, including its methodologies for generating knowledge and the theoretical frameworks that guide the procedural aspects of the endeavor. Subsumed within this definition are the underlying assumptions, philosophies, political motivations, and human interests relevant to NSEE as a specific field of academic inquiry.”

Two new groundbreaking publications are aimed at beginning the process of articulating a knowledge base for nanoscale science and engineering education.

Nanoscale Science and Engineering Education contains 36 state-of-the-art chapters that address current initiatives and issues in nano education, including noteworthy examples showing the integration of nanotechnology in undergraduate education.

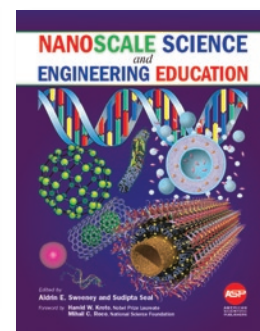
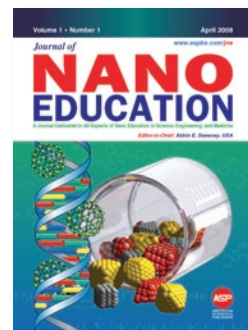
The *Journal of Nano Education*, an international peer-reviewed journal, is a natural outgrowth of the book. With a projected 2-3 issues per year (initially), it will continue to provide current developments and perspectives, while expanding the overall knowledge base. All manuscripts are subject to at least two reviews, one from a technical point of view and one for educational value.

The editors of these publications are very active in the University of Central Florida's nano education initiatives. Dr. Sudipta Seal, Nanoinitiative Coordinator, and Dr. Aldrin Sweeney, Associate Professor of Science Education, were PI and co-PI, respectively, on two NSF grants. One funded the establishment of a nanoscience and nanotechnology degree program at UCF, the other an REU program now in its sixth year.

Some of the ideas in the NSEE book were first expressed in the NSF-NUE program conducted by Dr. Seal, who sees the book serving as a model to the rest of the world for developing nanotechnology-based curricula. “The successful implementation of an undergraduate degree at UCF served as an inspiration to create this book,” he says.



Dr. Aldrin Sweeney
Editor-in-Chief, *Journal of Nano Education*



The Journal of Nano Education and Nanoscale Science and Engineering Education are due out in January 2008 from American Scientific Publishers. Cover images courtesy of Dr. Hari Singh Nalwa, American Scientific Publishers (www.aspbs.com).

For Dr. Sweeney, motivation for producing the book is based in part on the “very steep personal learning curve” he undertook when asked to contribute to the degree program, as such a book would have been a valuable resource for him at the time. “Essentially, I had to design my nano ed courses and seminars from scratch, not knowing much about others’ previous attempts in this area, since there were very few (or no) publications to refer to,” Dr. Sweeney says. “This all goes back to the concept of a knowledge base that can be accessed and utilized.”

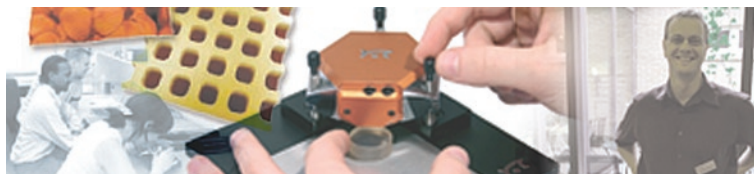
Dr. Sweeney explains that while a coherent body of knowledge in nanoscale science and engineering research is developing rapidly, the same coherence does not currently exist for nanoscale science and engineering education. The goal of both the book and the journal is to begin the development of a complementary, coherent body of knowledge in NSEE.

Both publications will be released in January 2008 (through American Scientific Publishers). For more information, including manuscript submissions and how to subscribe to the Journal and purchase the book, please visit aspbs.com/jne.

- from *Nanoscale Science and Engineering Education*

For Educators

TEACHNANO3 A SUCCESS!



The 3rd International Seminar on Teaching Nanoscience with Scanning Probe Microscopy, hosted by Nanoscience Instruments and Nanosurf, took place in conjunction with this year's ACS Spring meeting in Chicago, IL. Seminar presenters covered a wide range of topics and stressed the importance of hands-on experience to learning nanoscience and technology.

Lorraine Mulfinger of Juniata College's Science in Motion program described in her presentation Juniata's high school out-reach project. She talked about a learning assessment demonstrating the value of hands-on experimentation. The assessment showed that students retained significantly more information when engaged in hands-on learning than students covering the same information using printed materials only.

Leigh Smith of the Univ. of Cincinnati spoke about combining SPM with optics in the undergrad lab. He used gold nanorods, quantum dots and butterfly wings to describe Nanoscale Plasmonic Devices, Electronic Wavefunctions and Photonic Band Gaps while Vladimir Mitin presented his approach to an Undergraduate Nanoelectronics Laboratory at the State University of New York at Buffalo.

Roland Bennewitz of McGill Univ. shared his many years of experience using AFM in the classroom. His presentation "Teaching Force Microscopy" gave a very complete picture of the teaching process from start to finish. He covered class structuring and the importance of linking the hands-on sessions to the introductory and concluding sessions.

Presenters mentioned that there are significant challenges in starting and maintaining nanoscience education programs. For instance, lack of resources, time and opportunity to develop good science curricula are major problems, as well as lack of community support.

Learning about the various approaches to teaching nanoscience from the angles of different disciplines – physics, chemistry, biology and electrical engineering – fascinated participants. Their enthusiastic feedback has prompted plans to expand the seminar next year.

Visit teachnano.com for more details. Click the *Future Seminars* link to be included on the seminar's mailing list.

For Students

NANOSCIENCE ON THE TIP: A WORKSHOP IN SCANNING PROBE MICROSCOPY

The first annual NUE UNIQUE workshop was held this past June at the University of Washington.

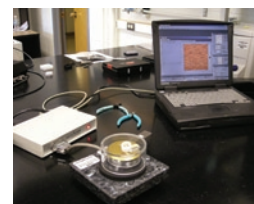


Sixteen undergraduate students with diverse academic backgrounds attended the week-long intensive using a variety of Nanosurf SPM systems.

The workshop's hands-on emphasis had students working in small groups, with 4 students for each SPM instrument and TA. Large computer monitors helped to maximize the participation of everyone in the group.

The five lab units in this year's workshop covered a wide variety of SPM techniques, including Scanning Force Microscopy and Dip-Pen Nanolithography, AC-Mode imaging and Electrostatic Force Microscopy, Force Spectroscopy Analysis, Force Modulation Microscopy, and Scanning Tunneling Microscopy.

Student responses to the workshop were overwhelmingly positive. Most pointed out how they managed to have a lot of fun while learning a great deal, as the schedule and amount of material were demanding.



NUE UNIQUE (Using Nanoscience Instrumentation for Quality Undergraduate Education) is an NSF-funded program based at UW and co-sponsored by Nanoscience Instruments and Nanosurf, AG. Its objective is "to develop a nationally replicable model of a sustainable and up-to-date undergraduate teaching laboratory of scanning probe methods applied to nanosciences and nanotechnology."

Applications for next year's workshop will be accepted beginning Spring 2008. For more details, including downloadable lab documents from this year's workshop, please visit nanoscience.com/UNIQUE.

EDUCATIONAL RESOURCES

Online Clearinghouse for SPM Educational Experiments

The newly-launched SPM Education site is a “clearinghouse for SPM experiments, techniques, labs and ideas that have been published in the scientific educational literature or developed by educators to be used primarily for educational purposes.” Experiments can be sorted by author, title, and date published.

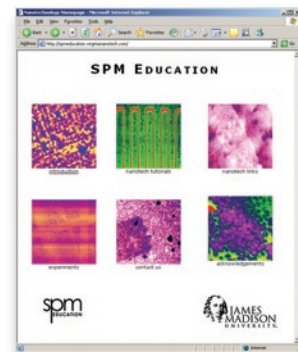
The site is part of the nanotechnology program at James Madison University. “The basic idea is to have one central clearinghouse for scanning probe themed experiments,” says Dr. Brian Augustine, Associate Professor of Chemistry at JMU, who

developed and manages the site.

“So if you’re a faculty member who would like to include an STM or AFM experiment in a course you’re developing, you don’t have to go hunting through all these different journals from different fields to find it. You can come to this one site, scroll through titles, and get a flavor for what has been published and when.”

Over 30 experiments were listed at the time of launch, and new submissions are invited.

spmeducation.virginiananotech.com



NanoEd Resource Portal Launched

The NCLT (National Center for Learning and Teaching in Nanoscale Science and Engineering) has launched a new site, the NanoEd Resource Portal. The goal of the site is to build up a comprehensive network and resource sharing to serve the greater NSEE community. The site

is designed to both gather and disseminate information on nano-education related topics, including education research, nanoconcepts, teaching materials, seminars, and degree programs. www.nanoed.org

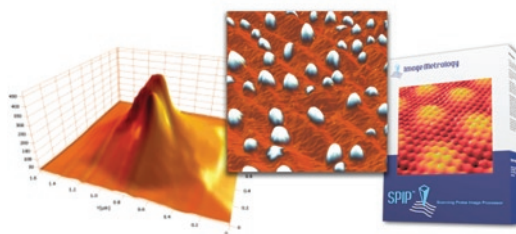
EDUCATIONAL PRODUCTS

Educational Pricing for SPIP Image Analysis Software!

Image Metrology has introduced new pricing for their Scanning Probe Image Processor (SPIP), the defacto standard in AFM & STM image analysis.

Previously, there was no pricing distinction between academic research and teaching uses of the software. Now, users involved in teaching AFM & STM can get additional, very attractive discounts on multiple units that fit perfectly in the classroom environment. These packages are full-featured versions of SPIP, and can open virtually every commercial AFM & STM file format. So regardless of which SPM system you’re using for your classes, SPIP provides a perfect solution to introduce sophisticated image analysis to your students.

Properly interpreting data is as important as properly acquiring it. SPIP can help you and your students remove image



**New
Lower
Price!**

artifacts, correct for line/slope effects, emphasize important features, and perform hundreds of other analysis functions. A full list of features is available on our web site.

If you would like to try SPIP for free, you may download a demonstration version at nanoscience.com/SPIP.

For more information on the new educational pricing, or to request a demo CD & brochure, please send an email to info@nanoscience.com, or call toll free +1 888-777-5573.