

DOE Center for Integrated Nanotechnologies Collaboration Begins

A series of workshops between the CNS-ASU and the Department of Energy's Center for Integrated Nanotechnologies (CINT) began November 20. The idea for a collaborative partnership in natural and social research originated in the 2004-2005 academic year between **David Guston**, Director of CNS-ASU and **Tom Picraux**, CINT Chief Scientist.



Postdoc **Erik Fisher** designed the current program and conducted the first workshop during a monthly meeting of researchers and managers at Los Alamos National Lab. Approximately 25 people attended, including all five CINT managers.

The first event consisted of a briefing on Environmental, Health, and Safety (EHS) considerations followed by questions and answers, and a general group discussion. The topics that emerged included limitations in understanding nanotechnology by publics, social scientists, industry representatives, and policy makers. There were mixed opinions regarding how well current research practices involving nanoparticles address potential EHS concerns.

As a result of the workshop, an additional event was added to the program to attempt to reach a broader community of users who interact with CINT.

Spring '07 Speaker Series Ready to Go - "Studying the Future of Nanotechnology"



On January 19, from 11:00 a.m. to 12:30 p.m. in the Biodesign Institute Auditorium, **Ulrich Fiedeler** of the Institute for Technology Assessment and Systems Analysis will be the next presenter in the 2006-2007 Speaker Series. Fiedeler has studied the development of nanotechnology from a variety of prospective approaches, including vision assessment and road mapping as a tool for technology assessment. His areas of focus include the role of nanotechnology in chemical substitution, social issues of neuronal implants, and naturalness and neuronal implants.

Other upcoming 2007 speakers on Page 5

Director's Corner:



Proud parents **David Guston** and **Kristi Marks** announce the arrival of **Samuel Jack Guston**, born Nov. 9 at 12:32 p.m., 20.5 inches long and weighing 6 pounds, 12 ounces.

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Upcoming Nano Events:

Jan 19, 2007: Science Café: "Adaptive Technologies for the Central Nervous System: Are We Changing What It Means to be Human?" Bioengineer **Dr. Ranu Jung** and bioethicist **Dr. Jason Robert** will talk about designing technology to promote adaptation in living systems as it relates to victims of spinal cord injuries, including the ethical issues around altering our bodies at the molecular to the systems level. 5:30-6:30 p.m. at the Arizona Science Center.

Feb 16, 2007: Science Café: "Why Things (Still) Don't Fit: Human Variation and Ergonomics in the 21st Century." Ever wonder why, in an age of computer-aided design, digital human modeling and virtual prototyping, you still can't find the right adjustment to your car seat? Why some clothes fit so poorly?

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Seats Still Available in New Spring Courses

Nanotechnology and Society Learning Community

Need to meet science and society requirements but not quite sure where to start? Get involved in the Learning Community! Launching in spring '07, the Nanotechnology and Society Learning Community earns nine credits overall, six of which are science/society credits. The interdisciplinary course will be taught by **David Guston**, Director of CNS-ASU, **Neal Woodbury**, Director of the Center for BioNanotechnology, and **David Conz**, post-doctoral researcher at CNS-ASU and Faculty Associate, School of Human Evolution and Social Change. To enroll, contact Miranda Carlton-Carew at 408-965-6905 or macc11@msn.com.

To download a flyer of course details, go to <http://cns.asu.edu/new-at-cns/LCFlyer-Sp07.pdf>

Nanotechnology Law and Policy

Gary Marchant, **Ken Abbott** and **Doug Sylvester** will teach this new course at the Sandra Day O'Connor College of Law, Monday evenings, 6:30-8:30. The course is closed to new registrants except for non-law graduate students. Interested students should contact Gary.Marchant@asu.edu.

Science Café Attendance Grows

October 29 – *What We Can Do (and Can't Do) to Make Our Skies Blue Again*



With the scientific consensus regarding global warming and news talk about finite resources, "Alternative Fuels" was the timely topic of the October Science Café. Presented by **Dr. Daniel C. Brune**, a Senior Research Specialist in the Protein Chemistry Lab at ASU, and CNS-ASU's

Post-Doc **Dr. David Conz**, who has been making his own biodiesel for almost five years, the Café filled the meeting room at Changing Hands Bookstore. Among the attendees were a large number of car and conservation enthusiasts, whose lively interaction gave this Café the most audience-initiated discussion to date. Issues included wondering about the efficiency of fuel alternatives from switchgrass to butanol, and audience members traded many personal stories concerning their own experimentation. This group was clearly interested in the U.S. freeing itself from petrochemical dependence.

November Science Café on Page 5

Upcoming Nano Events:

Feb 16, 2007: **Dr. Claire Gordon**, a scientist with over 20 years experience in Army ergonomics, will discuss the good and bad approaches designers take to accommodate body sizes and shapes in today's population, and what it means for some jobs where proper equipment fit is critical.

Mar 12-16, 2007: "Nano & Giga Challenges in Electronics and Phonetics." The organizers invite the support of sponsors and the help of volunteers in organizing the conference. If you are interested in helping, or know of student volunteers who may be interested, please contact **Stephen Goodnick** (stephen.goodnick@asu.edu), **Herb Finkelstein** (herb.f@asu.edu), or **Anatoli Korkin** (korkin@nanoandgiga.com).

Mar 23, 2007: Science Café: "Transferring Western Technology to Developing Countries: Good Intentions, Unexpected Outcomes." Technology transfer to developing countries will be discussed by **Dr. Bert Jacobs**, whose research includes programs in Africa related to HIV, and **Dr. Jamey Wetmore**, who is concerned with social and ethical issues surrounding the transfer of technology.

Apr 19-21, 2007: CNS-ASU "All Hands Meeting." Tempe, AZ

Apr 20, 2007: Science Café: "Could a Computer Become Sentient? – Reductionism and Emergence in Science." Physicist **Dr. Michael Thorpe** and philosopher **Dr. Ramsey Eric Ramsey** will consider whether everything builds up from elementary particles to achieve complexity, or whether complexity emerges from an "unstructured soup."

Apr 24, 2007: "Technological Enhancement of Humans? Perspectives of Researchers from Under-represented Populations." Arizona State University.

May 18, 2007: Science Café: "Forbidding Science: Are There Things We Just Shouldn't Know?" Is some science simply too dangerous? If so, should it be forbidden? **Dr. Dan Sarewitz** and **Dr. Roy Curtiss** will explore how we can deal with these difficult questions.



Recent Speaker Abstracts

December 15 - Meyya Meyyappan, NASA Ames Research Center - *Designing the Future on the Nano-Frontier*

Nanotechnology deals with creation of useful materials, devices and systems of any practical size by manipulating matter at the nanoscale and by taking advantage of novel and interesting properties that arise solely because of the nanoscale. This tiny technology is a broad, enabling technology with expected impact on every aspect of the economic spectrum: materials and manufacturing, electronics and computing, health and medicine, energy, environment, transportation, national security etc.

There is a tremendous excitement across the world about this technology of the 21st century. Mayyappan's talk provided an overview of nanotechnology, what we can expect in the near, medium and long term, and what it means for society.

Meyya Meyyappan is Chief Scientist for Exploration at the Center for Nanotechnology, NASA Ames Research Center in Moffett Field, CA. Until June 2006, he served as the Director of the Center for Nanotechnology as well as Senior Scientist. He is a founding member of the Interagency Working Group on Nanotechnology (IWGN) established by the Office of Science and Technology Policy (OSTP). The IWGN is responsible for putting together the National Nanotechnology Initiative.

December 1 - Michael Cobb, North Carolina State University - *What Happens When Americans Learn More About Nanotechnology? (The Good, The Bad, The Ugly)*

The public profile of ethical, social, and political issues associated with scientific research has renewed attention to questions about its place in society. Post 9-11, the relationship between national security and research has received considerable attention. Questions raised include whether the knowledge generated through life science research and in related fields such as nanotechnology and engineering, might facilitate the production of bioweapons and whether controls should be placed on what gets done, how, and whether information is widely circulated.

Cobb's presentation elaborated a pragmatic empirical research agenda for engaging with practicing scientists regarding the governance of their work. It proposed a strategy of engagement and learning relevant for other areas of emerging controversy. Various dilemmas with social and life science research were recounted with a view to reflecting on the unavoidable choices made in efforts to promote responsive research.

Presentations/ Conferences:

CNS director [Dave Guston](#) collaborated with [Vivian Weil](#) of the Illinois Institute of Technology to organize a panel on "New Ethnographies of Nanotechnology" for the annual meeting of the Society for the Social Studies of Science in Vancouver on November 2, 2006. Panelists included: [Rob Doubleday](#), Cambridge University; [Erik Fisher](#), ASU; [Julio Tuma](#), University of Chicago; [Dave Conz](#), Arizona State University. Discussants included [Rosalyn Berne](#), University of Virginia and [Vivian Weil](#), Illinois Institute of Technology. The room was packed, and there was very lively discussion and debate!



[Dr. Guston](#) also talked about "Anticipatory Governance of Emerging Technologies" at the December 14 monthly seminar of the Arizona Nanotechnology Cluster. Approximately forty members of private sector nanotechnology-related businesses and state technology support agencies attended the event.

[Jan Youtie](#), Georgia Tech, presented "Nano Research Enterprise Assessment," at the Workshop on Next Generation Metrics, SRI, Arlington, VA, on October 20, 2006.

Other CNS-ASU Activity:

[Yongsheng Chen](#), Associate Professor in Civil and Environmental Engineering, has been working on nanotechnology for environmental applications, most recently on two EPA STAR-funded projects evaluating the potential risks of manufactured nanomaterials in drinking water and their long-term bioaccumulations in food chains.

Recent Speaker Abstracts (*Continued*)

November 17 - Griffith Kundahl, Feinstein Kean Healthcare - *New Communication Strategies to Guide the Future of Nanotechnology*

The great promise of nanotechnology comes with many uncertainties regarding the science's impact on areas from international competitiveness to health and safety to regulatory reform. A new playing field characterized by social uncertainties, paradoxes and unintended consequences has emerged for corporate, government, nonprofit and academic stakeholders. To further their respective missions, these stakeholders must learn to communicate in new ways, utilizing new methodologies, and through adaptive and perhaps unorthodox channels.

Kundahl reviewed how some nanotechnology stakeholders are already adopting new communications strategies. He also looked at how others might proactively anticipate and engage future issues, and how planning techniques and strategies can be customized and mobilized for the novel challenges nanotechnology will present in the future.

Technological Enhancement Conference

Continuing its commitment to reach the widest possible audience, on April 24, 2007, CNS-ASU, the Hispanic Research Center, et al., will co-sponsor **"Technological Enhancement of Humans? Perspectives of Researchers From Underrepresented Populations,"** a research conference for undergraduates.

Call for Papers: Two categories of research of interest: 1) research in human enhancement-related STEM fields that are strongly influenced by the perspectives of underrepresented populations in their work; and 2) research on societal aspects of converging technologies and human enhancement with specific concerns about underrepresented perspectives. Student research paper presenters will also provide a poster presentation summary of their research papers for display during the conference.

Abstracts for research papers to be presented that address one or both of the above two general categories will be accepted and notifications will be made on a rolling basis, with a final deadline for electronic submission of abstracts of January 24, 2007 and final notifications by January 31, 2007. The final deadline for electronic submission of completed papers is February 28, 2007.

More Information: Call 1-800-327-4893 (bilingual Spanish/English advisors will answer) or email MGE@ASU today for more information regarding how to submit an abstract, register for the conference, and apply for a research paper presenter scholarship.

Other CNS-ASU Activity:

Phil Schapira and his team continue their work on nanotechnology definition and terms, publication and patent data cleaning, and geographical identifiers. Particular effort has gone into cleaning and associating geography to Chinese nano publication records. **Jan Youtie**, **Maurizio Iacopetta**, and **Stu Graham** continue working on nano as a general purpose technology and are revising a paper to be submitted to *The Journal of Technology Transfer*. Georgia Tech is also engaged in an exchange with **Michel Zitt** (Infra, France) in preparation for comparison of PRIME and CNS-ASU@GT nano profiling definitions. The team anticipates the databases of nano publications and patents databases to be ready for first detailed analytical runs in November 2006.

NanoLinks:

CNS-ASU website: <http://cns.asu.edu>

More on the Nano and Giga Conference International Nanotechnology and Society Network at <http://www.AtomicScaleDesign.net/ngc2007>
You can subscribe to nanolist@asu.edu by contacting Ira.Bennett@asu.edu

Sandia National Lab and the Consortium for Science Policy Outcomes co-sponsored a workshop on enhanced human cognition. See report at <http://www.cspo.org/ourlibrary/articles/FinalEnhancedCognitionReport.pdf>

Dr. Paul Privateer's class on transhumanism has created a website at <http://studiesinthetranshuman.blogspot.com>

Dr. Phil Shapira's team at Georgia Tech has discovered how difficult it is to refine nano search terms. Read his briefing paper at <http://cns.asu.edu/cns-library/documents/Porter-Shapira Nano Search Briefing Paper.pdf>

Science Café Attendance Grows (*Continued*)

November 19 – *Visions of Nanotechnology*

“While technology shapes the future, it is people who shape technology and decide what it can and should be used for.” Kofi Annan

The final Café of 2006 showcased CNS-ASU’s work in technology scenario-development, and the standing-room only crowd voiced its agreement that thinking about the future is important. CNS-ASU Post-Doc Research Associates **Dr. Cynthia Selin** and **Dr. Ira Bennett** facilitated much audience participation, which revealed many societal concerns concerning nanotechnology. For example, regarding nano-scale applications in healthcare, audience responses included:

- ▶ What if you are blacklisted for having a disease?
- ▶ What if you are diagnosed early for something with no cure? How does that affect the quality of your life?
- ▶ How do you get this stuff out of your body?
- ▶ Early discovery does give you more time to fight it.
- ▶ What if sooner or later [the nano material] is going through everyone’s blood, people who didn’t want it?
- ▶ It probably won’t be a cheap medical fix, and it may be used initially for the sorts of things that pharmaceutical companies are pushing instead of, say, things that are actually killing a large part of the world, like diarrhea.
- ▶ Who is going to control all those medicines?
- ▶ How will broad patents be issued? Who should own which kinds of nanotechnology?
- ▶ How can you prove if someone is infringing on your patent, given the size of the materials, and what if they become building blocks for other things.

CNS-ASU is grateful to the Changing Hands Bookstore for so graciously hosting our fall semester Cafés. Due to their increasing popularity, beginning in January 2007 the Science Cafés will move to the Arizona Science Center in downtown Phoenix, at 600 E. Washington Street. They will be held on the third Friday of the month, from 5:30 – 6:30 p.m.

Upcoming 2007 Speaker Series:

All presentations are 11 a.m. - 12:30 p.m. in the Biodesign Institute Auditorium.

Feb 23, 2007: **Arie Rip**

Rip coordinates a program on TA and societal aspects of nanoscience and technologies in the research consortium NanoNed. Originally a chemist, he moved into chemistry & society, and science, technology and social studies more generally, at Leiden University. He was a professor of science dynamics at the University of Amsterdam before joining the University of Twente in 1987 as a professor of science & technology. Rip developed the approach of constructive technology assessment, and also studies science policies and changes in knowledge production.



Mar 30, 2007: **Ahmad Soueid**

Soueid is Principal/SVP of HDR Architecture, Inc. and focuses exclusively on the design & construction of advanced technology facilities. He is an internationally known leader in the design of nanotechnology facilities, such as the NIST Advanced Measurement Laboratory, Birk Nanotechnology Center at Purdue, and the Center for Functional Nanomaterials at Brookhaven National Lab. Soueid also served as nanotechnology facilities advisor to Centro Nacional de Metrologia in Mexico and National Physical Lab (UK), and was co-chair of the Buildings for Advanced Technology Workshop I & II sponsored by ASU in January 2003 and 2004.

