

NanoDays 2009

To help people understand the importance and implications of Nanotechnology, the University of Tennessee Health Science Center sponsored the first local celebration of "NanoDays," a weeklong series of educational events that started on March 27th and ran through April 3rd 2009. "NanoDays" is nationwide festival of educational programs supported by Nanoscale Informal Science Education Network (NISE Net). The event at UTHSC offered unique features such as teacher's in-service, hands-on experience for students, demonstrations, forums, and symposiums that demonstrated the contributions of nanotechnology.

NanoDays at UTHSC was widely successful and generated tremendous enthusiasm among students, teachers, people, scientists and physicians in Memphis area. The event received a very strong commitment from various groups within the community such as educational institutions - UTHSC and the University of Memphis; commercial organizations -the Brother International Corporation, Bartlett, TN; informal science education programs - the Pink Palace Museum, the Minimed and the Memphis Public Library; and after school programs - the Girls Inc.

Events:

"NanoDays" Events 2009			
Date	Event	Participants	Number
27-Mar	Demonstration for High School Students	Trezvant High School Students	20
28-Mar	Teachers In-service (Presentations and Hands-on activities)	School Teachers, Educators	19
30-Mar	Nanotechnology Presentation	General Audience	62
30-Mar	Nanomedicine Symposium	Researchers and Physicians	42
31-Mar	"No Fooling Nanotechnology is Here" Demonstration	Students and General Audience	17
1-Apr	"No Fooling Nanotechnology is Here" Demonstration	Students	29
2-Apr	Nanotechnology, Presentation and Hand on activities	School Administrators/ Teachers/ Students	64
3-Apr	Nanotechnology, Presentation and Hand on activities	Students during after school activity at the Girls Inc	73
Total			326

Speakers and Organizers:

Hershel P. Wall, M.D., Chancellor, UTHSC inaugurated the NanoDays event. The experts who gave presentations came from multiple organizations. The speakers were as follows: Alexandru S. Biris, PhD, Chief Scientist, Nanotechnology Center at University of Arkansas at Little Rock; Evgueni Pinkhassik, PhD, Director of Nanomaterials Development and

Innovation at the University of Memphis; Kangning Liang, PhD, Senior Principal Engineer; Farzad Parsapour, Ph.D., senior principal engineer in the Technology Research and Advanced Development group from the Brother International Corporation, Bartlett, TN.; Charles R Handorf, MD, PhD, Chair Pathology Department; Ram I Mahato, PhD, Associate Professor; and Anand L Kulkarni, MD, Assistant Professor from UTHSC.

Ms. Alice Eliers, the Education Department with the Pink Palace Museum, Dr. Vickie Baselski, Dr. Cameila Johns, Ms. Barbara Frederick, and Ms. Leslie Ingram all from the Pathology Department, UTHSC conducted the demonstrations at multiple events. The events were sponsored by Dr. Robert Shreve, Associate Dean, College of Medical Education, and UTHSC.

The demonstrations included the joint efforts of participants to construct a more than 1 billion nanometer long model of a nanotube. The participants also constructed individual models of bucky balls using a kit provided by NISE Net. Demonstrations were also conducted to explain the principals of Scanning Probe Microscopes (SPM), and changes in properties of materials at the nano level. Ms. TaJuana Redmond, Ms. Pam Houston, Ms. Simpronia Taylor, Ms. Crystal Stanton and Ms. Susan Lexow all from UTHSC, Ms. Beebe Woodside from Memphis Public Library, and Ms. Netisha M. Burnett from Girls Inc. coordinated the events.

Ms. Sheila T Champlin, Director Communication and Marketing, UTHSC, and Ms. Lillian Johnson from the Memphis Public Library gave wide publicity to the event. The events were published in the local newspaper, the Commercial Appeal, on 04/03/2009 and also in the "Records" which is a local monthly publication of UTHSC.

Details of the Events:

March 27th – Event was conducted at the General Education Building, UTHSC by Anand Kulkarni, MD. Twenty students from Trezevant High School, a Memphis City School, attended the forty-five minute event. The participants received a presentation followed by hands-on activity allowing them to construct a model of a bucky ball using precut stencils provided by NISE Net. All of the students reported that they enjoyed the event and understood the concept of scale ranging from Macro to Micro to Nano.

March 28th – Event was conducted at the Student Alumni Center (SAC), UTHSC. Nineteen school teachers and educators participated in the event. Presentations were given by Drs. Handorf and Kulkarni, followed by hands-on activities. The participants enjoyed constructing a more than 1 billion nanometer long model of nanotube. The participants also learned the importance of nanotechnology and its applications. They also gained understanding of the principles of scanning probe microscopes (SPM) and how materials alter properties from macro- to nano- scale level.

March 30th - Two separate events were conducted at UTHSC. The purpose of the first event was to educate the audience, composed mainly of the general public, about the importance of nanotechnology. The event consisted of multiple presentations from experts. Sixty-two participants attended the event which was held at the Hamilton Eye Institute, UTHSC,

Memphis from 8 am to 10 am. The response from the participants was excellent and requests have been received to conduct more events of similar fashion.

The second event conducted was a symposium for researchers and faculty members from local educational institutes. Forty-two participants attended the symposium held in the Link Building, UTHSC. The need for a Nanomedicine center was addressed and everyone agreed to form a "NanoMemphis Consortium".

March 31st and April 1st - The Pink Palace Museum and the Department of Pathology, UTHSC collaborated in conducting, "No Fooling, Nanotechnology is Here", at the Memphis Public Library. Seventeen participants from various age groups attended the event held at the Cordova branch on the 31st. On April 1st, twenty-nine students attend the event and participated in constructing bucky balls at the Main library.

April 2nd – "Minimed", an outreach activity, was conducted at the Student Alumni Center (SAC), UTHSC. Sixty-four teachers, students, and administrators participated in the Minimed event dedicated to NanoDays. During the event, a presentation was given by Dr Kulkarni, and the participants were allowed to construct bucky balls, and participate in an experiment explaining the principle behind scanning probe microscopes (SPM). Reportedly, the participants most enjoyed constructing a model of a nanotube. Multiple groups prepared small models and then combined them to make a long (> 1 billion nanometer) model of nanotube.

April 3rd - The NanoDays celebration was concluded by conducting NanoDays activities at an after-school activity held at Girls Inc. Seventy-three girls (from ages 6-18 years) participated in the event. The smallness of the nano was enforced by having the participants measure the length of their hair and their height in nanometers. The participants were also shown a conceptual visualization of the size of a bucky ball as compared to a red blood cell.

All of the events were extremely successful. We have since received requests to conduct events at multiple locations. To continue this progress, we will be conducting an event at the Memphis Zoo on May 5th for the curators and educators. Guidance and material from NISE Net was of invaluable and allowed us to conduct the NanoDays event successfully.

Evaluation:

All of the events were widely successful and acknowledged by participants. All adult participants were requested to provide an evaluation. The NanoDays event evaluation prepared by Vickie Baselski, PhD, Professor in Pathology, UTHSC, included the opportunity to evaluate fulfillment of the expectations pertaining to the event, knowledge of the speakers, and quality of the facilities where the events were conducted. The form also gave an opportunity for the participants to write the parts they most and least enjoyed about the event. We received 60 evaluations, with most who completed the evaluation agreeing that the event met their expectations while 74% remarked that the event exceeded their level of expectation. Nearly 100% of the audience agreed that the speakers were very well qualified. The best part of the event, according to the majority of the participants, were hands-on activities and medical applications of nanotechnology.

Conclusion:

The symposium concluded with all of the scientists and physicians agreeing to form a "NanoMemphis Consortium". Many of the participants requested continuing information resources and the continuation of similar events. Multiple additional requests for continuation of the events have already been received. Outreach events designed to enhance nanotechnology awareness within the society will be conducted after the end of NanoDays.

Future Goals:

Since there is no NSF funded Nanotechnology center or user facility in a 100 mile radius of Memphis, there is a tremendous need for education and awareness regarding Nanotechnology. The Pathology Department of UTHSC, in conjunction with multiple collaborators from the Nanotechnology Center at ULAR, Memphis Public Library, Memphis Zoo, the Pink Palace Museum, and Girls Inc. will continue the events to enhance nanotechnology awareness in the Mid-South region for the remainder of the year. Multiple events and presentations will be conducted for students, teachers, and the general audience at several locations. The ambitious project of constructing a model of a 1 trillion nanometer long tube will be undertaken to promote awareness within the society.

Short Term Goals:

- 1) Form the NanoMemphis Consortium to provide a platform for the researchers, physicians, administrators, and educators to exchange dialogue regarding the progress of nanotechnology in our area.
- 2) Continue educating the community by organizing activities at multiple informal science education locations such as Memphis Zoo, Memphis Public Library, the Pink Palace Museum, and after school programs.
- 3) Submit a Challenge grant application to receive an appropriate level of funding for the outreach program.
- 4) Conduct city-wide outreach effort to construct a model of 1 trillion nanometer long nanotube.

Long Term Goals:

- 1) Establish a NSF funded NanoMedicine center at Memphis.
- 2) Establish an educational program to generate the nanotech task force of tomorrow.
- 3) Outreach activities to educate community regarding the importance, applications, and possible hazards of nanotechnology.