

Program Activities

Participation in this program consists of two components:

- (1) a 2-week summer institute and
- (2) academic year follow-up activities.

By registering for this program, you are committing to completing both components of the program.

2-week Summer Institute

Fisk University* – 9-20 June 2008

Purdue University – 9-20 June 2008

University of Texas at El Paso* – 9-20 June 2008

Alabama A&M University* – 16-27 June 2008

Argonne National Laboratory/Northwestern University* – 16-27 June 2008

Hampton University* – 23 June-3 July 2008

*Commuter site; no travel reimbursement

Academic Year Follow-Up Activities

- Attending a 1.5 day seminar on nanoscience at an NCLT partner site in March 2009
- Implementing an NCLT-related lesson plan in 7-12 classroom
- Conducting a teacher inquiry: analyzing student learning as a result of NCLT-related lessons



To download an application go to:

www.nclt.us

The application deadline is March 14, 2008*
Participants will be notified of acceptance in the program by April 11, 2008.

** Applications will be accepted until all spots are filled.*



The National Center
for Learning and Teaching in Nanoscale
Science and Engineering (NCLT)
is sponsored by
the National Science Foundation.



Contact Information

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EA/EOU

National Center for Learning and
Teaching in Nanoscale Science
and Engineering

NCLT



Inquiry Based Instruction
in Nanoscale Science and Engineering
2008-2009
Professional Development
for Grade 7-12 Teachers

www.nclt.us

The NCLT Professional Development Program

The NCLT-PD program is designed with the following goals:

- (a) to provide grade 7-12 science teachers with an enhanced understanding of nanoscience;
- (b) to introduce teachers to inquiry-based methods for teaching nanoscience;
- (c) to provide grade 7-12 science teachers with a collection of suitable classroom activities;
- (d) to assist teachers in developing their own nanoscience activities and projects for classroom use;
- (e) to enhance teachers' awareness of the connections between nanoscience and the traditional sciences of chemistry, physics, biology, earth science, and mathematics.



Science and Engineering Content

NANOFABRICATION

Sample Activity: Lego Self-Assembly – Students design a unique self-assembly system using legos to represent molecules and magnets and Velcro to represent intermolecular forces.

LITHOGRAPHY

Fabrication of nanocircuits using lithography.

VISUALIZATION AND TOOLS

Sample Activity: Touch-Based Imaging and the Atomic Force Microscope – Students understand how images at the Nanoscale are created by designing their own scanning probe microscopy tip.

SIZE-DEPENDENT PROPERTIES

Sample Activity: Biosensors – Students investigate how the size of a particle affects the color observed which is currently being exploited in lead and anthrax detection.

Sample Activity: Quantum Dots – Students investigate the properties of light that make color a function of size.

OTHER NANOSCIENCE AND ENGINEERING TOPICS

Nanomedicine Size and Scale Allotropes of Carbon Ferrofluids

Inquiry Based Pedagogy

SCIENCE STANDARDS

Discussion of "Inquiry and the National Science Standards"

MODELS AND SIMULATIONS

Sample Activity: The Role of Models and Analogies in Science Education – Participants evaluate pros and cons of several models with a focus on the misconceptions that could accompany their use.

CONCEPTUAL BOUNDARIES

Understanding student conceptions and misconceptions

Reflective Practice

ASSESSMENT

Participants will contribute via surveys, focus groups, and reflective journals throughout the year.

DISSEMINATION

Participants will present lessons at national, regional, and/or local science teacher conferences.

LESSON IMPLEMENTATION ANALYSIS

Teachers will implement at least one NCLT related lesson in their classrooms and analyze their implementation of that lesson using a standardized protocol. Teachers also may video-record themselves as they teach nanoscience units and use a standardized rubric to analyze their video-recorded teaching.

Stipends and Travel

2-WEEK SUMMER INSTITUTE:

Participants will receive a \$1,000 stipend and will be reimbursed for travel expenses where applicable.

ACADEMIC YEAR FOLLOW-UP

Participants will receive a consultant fee for:
Attending a 1.5 day seminar in Spring 09

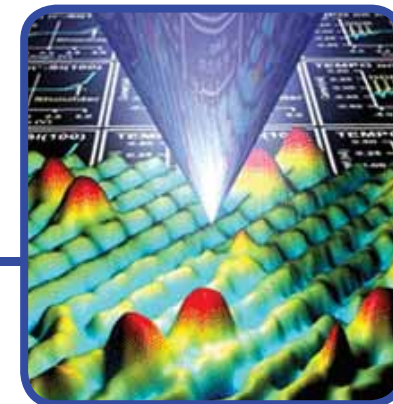
Implementing an NCLT-related lesson plan in 7-12 classroom, conducting a teacher inquiry: analyzing student learning as a result of NCLT-related lesson, and maintaining a teaching journal of nanoscale science and technology

Presenting your teacher inquiry to NCLT

Professional Development Credit

The professional development credit offered varies according to the workshop site and each individual's home state.

For more information, visit:
http://www.nclt.us/pd_activities.htm



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