

APPENDIX 14: UNIVERSITY OF MASSACHUSETTS AMHERST/ CENTER FOR HIERARCHICAL MANUFACTURING PROFILE

I. Description

Institution: University of Massachusetts Amherst

PI: Jim Watkins

Co-Pis: Mark Tuominen

Title: NSEC: Center for Hierarchical Manufacturing (CHM)

Proposal: 0531171

Program Officer: Kevin Lyons

Education Outreach Director: Mark Tuominen tuominen@physics.umass.edu and Mort Sternheim, mort@k12.umass.edu

II. Research Agenda

Research Focus: Basic research is divided into three technical thrusts: nanoscale materials and processes, nanoelectronics, and bio-nanotechnology. Testbed projects, carried out with industrial partners, are the vehicle used to establish proof-of-concept prototypes in nanomanufacturing. A National Nanomanufacturing Network (NNN) is nucleated within the project, in partnership with other NSECs, as a vehicle for university-industry collaboration and nanomanufacturing clearing house activities. Societal impact studies complement the other activities.

NSEC Description: The CHM is a NSEC with a focus on nanomanufacturing R&D. The center has a strong emphasis on catalyzing interactions and activities that lead to integrating nanotechnology into safe commercial products.

III. Education Activities within the University

Description of activities (Note this new NSEC starts in October 2005)

- ◆ K-12 *Teachable Nanoscience* summer workshops for science teachers
- ◆ Undergraduate course Introduction to Nanoscience for science and engineering majors
- ◆ Summer REU experiences
- ◆ Video-based learning modules for technical community college (in collaboration with Springfield Technical Community College)
- ◆ Public outreach: Web based nanotechnology "vignettes" that highlight nanoscale science and engineering
- ◆ (Affiliated) NSF IGERT graduate program on nanotechnology: "Lab to Fab"

Program staff and expertise

Search in progress for our NSEC education and outreach coordinator; Mort Sternheim K-12 education coordinator; Gordon Snyder community college education coordinator; others to be named.

Goals and objectives

Creation of sustainable and updatable curriculum materials for nanoscience education; training experiences for students from community college to graduate level.

Target audience (educational levels, number of students at each level, etc.)

Pending

Current activities

Project has not yet started

Nano S&E content focus

Teachable Nanoscience (K-12)

IV. Education Activities Outside the University**Description of activities**

Web-based educational materials development with STCC (see above)

Program staff and expertise**Goals and objectives****Target audience (grade levels, number of students at each level, school districts, etc.)****Current activities**

Project has not yet started.

Nano S&E content focus**Nano S & E content consultants****V. Education Outreach Materials****Describe and provide examples of materials, outlines, demonstrations, etc. developed for outreach activities for the K-12 and/or informal audiences**

One-minute nanotechnology video vignettes for public outreach; delivered via web.

Describe a recent successful education outreach activity

Project has not yet started.

VI. Education Outreach Evaluation**Summarize outreach evaluation plan**

Periodic external evaluation by Peterfreund and Associates (or equivalent).

Summarize outreach evaluation results

VII. Lessons Learned

List 2-3 lessons learned to share with others embarking on a nano education outreach effort

Project has not yet started.

Describe what you might do differently in the future

