Monroe County Community School Corporation
BOARD OF SCHOOL TRUSTEES
Regular Meeting, October 21, 2008

FOR INFORMATION: Proposal for IUNano and MCCSC Partnership

Dr. Jill Robinson, a Senior Lecturer in the Department of Chemistry and Outreach Director for the newly established nanoscience center (IUNano) at Indiana University is proposing a partnership with the Monroe County Community School Corporation and the IUNano Center. The IUNano Center was recently approved by the Dean of the College of Arts and Sciences and will facilitate collaborations between researchers and develop state of art facilities for analysis of nanoscale systems on campus. The partnership between MCCSC and IUNano will promote energy and nanotechnology education by creating programs that would benefit schools, teachers, and students.

Background Information

IU faculty members are in the process of submitting three large proposals to the National Science Foundation and the Department of Energy to fund the research and education missions of the center. The educational goals are as follows: to enhance energy/nanoscience education in schools and in the general population, to encourage capable students to pursue careers in science and science education, to develop strategies and programs to increase the number of under-represented minorities completing science degrees at the undergraduate and graduate levels, and to develop a fellowship program that will increase the number of highly qualified women pursuing academic careers. Several of these goals could be greatly enhanced through a partnership with MCCSC and will be described below.

MCCSC Partnership

Energy/nanoscience education workshops for middle and high school teachers will be developed to improve teachers’ understanding and ability to teach these rapidly changing fields. The main premise of the workshops will be to integrate nano and energy experiments into the prescribed school curriculum so that the required fundamental science concepts (state standards and indicators) will be taught, while exciting students about science at the same time. Stipends will be provided to cover travel, housing, and food costs for participating teachers and kits containing supplies for experiments will be given. Opportunities for teachers to interact and engage in substantial reflection and analysis of their lessons as well as continuing support in the development of their subject matter knowledge will be provided.

In addition, several summer science camps will be hosted at IU to encourage students to explore new discoveries, talk to researchers, meet other students with similar interests, and cultivate an excitement for science in general. An example theme for the high school camp is solar energy. Students will be introduced to basic concepts in order to understand how the sun’s energy can be transferred into electricity or used for heating. Experimentation with solar cells and with substances used for storing solar thermal energy will be performed. At the end of the week, a competition will be held where students work in teams to combine results of the previous experiments with some basic engineering to design the best system for storing solar energy for a model house or generate electricity from the sun to run a model car. Another goal is to recruit more students to pursue science or science education careers. To do this teaching research/internships for IU undergraduates studying science or education will be created. Science majors will have an opportunity to teach in hopes that some will be drawn to this profession and similarly education students will gain valuable research skills which will enable them to integrate research and inquiry into their future classrooms. College students will also serve as role models who can potentially inspire high school students to consider pursuing a career in science or education.
A partnership with Wonderlab museum will also be established to make new discoveries and technology accessible and understandable for all people. Hands on activities and exhibits will be developed for the popular Science on the Spot (SOS) stations. An example SOS activity for younger children is to explore numbers, patterns, and shapes using models of the various forms of carbon: graphite, diamond, fullerenes, and nanotubes. The activity would involve construction of models in order to compare structural differences in combination with experimentation of properties of the models such strength and lubricating ability. An exhibit for older children or adults explaining the potential of carbon nanotubes for storing hydrogen could accompany this hands-on activity.

The IUNano Center would like to include a letter of support from MCCSC stating that the school district would utilize these programs. The Center would also like to buyout one-half (.50) of Jean Schick’s salary so that Jean’s time can be spent developing materials and programs for students and teachers. The outreach team consists of IU Science Faculty and IU School of Education faculty who have experience in teacher professional development and science camp programs. However, Jean’s extensive classroom experience would be a great asset. The goal is to develop programs in a way so they are practical and useful for teachers and students.