

Proposer: Professor Cheng Chin

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Sponsor: National Science Foundation, Chicago MRSEC, APS Prairie Section

Prior Effort

S.M.A.R.T. (Science, Math, And Research Training) K12 program The *University of Chicago* is uniquely situated for outreach programs targeted toward underrepresented minorities, due to its location in Hyde Park on the historic south side of Chicago, where over 90% of the local high school population is of African American heritage. The current grant allowed me to initiate a new S.M.A.R.T. (Science, Math, And Research Training) program in 2008 to share education and research resources with underrepresented minority students in high schools in the Hyde Park area. The program consists of a series of lectures and experiments, laboratory tours and demonstrations, as well as tours to museums, observatories and Argonne National Laboratories. The programs have been well attended by 8~12 students every year and organized by graduate and undergraduate students, as well as postdocs. Further supports come from the Physics Department, James Franck institute of the Univ. of Chicago, as well as the Chicago MRSEC. Links to the past programs are:

S.M.A.R.T. 2011 Outreach Program <http://ultracold.uchicago.edu/SMART2011>

S.M.A.R.T. 2010 Outreach Program <http://ultracold.uchicago.edu/SMART2010>

S.M.A.R.T. 2009 Outreach Program <http://ultracold.uchicago.edu/SMART2009>

S.M.A.R.T. 2008 Outreach Program <http://ultracold.uchicago.edu/SMART2008>

Proposed Works

Promote a new S.M.A.R.T.+ (Science, Mathematics And Research Training) program serving underrepresented K-12 students on the Chicago South Side

This opportunity has been well recognized by University of Chicago administrators, who recently initiated a major project to extend the university's education capacity to primary and secondary schools in nearby neighborhoods. In particular, the university is building an innovative high school in the Woodlawn community-- where the population is >98% African American and Hispanic. This high school, an expansion of the University of Chicago Charter School system, was commenced in the fall of 2006 and will reach its full capacity in 2010.

Due to the fortuitous timing, I find the newly created Woodland High School (WHS) an excellent opportunity to contribute critically to high school science education in a welcoming and enthusiastic URM community. I propose to launch a 'SMART' program to strengthen the WHS science and mathematics curricula and to motivate greater interest in physics and mathematics. I propose as extensions to the university's existing commitment, and with support from this proposal, the following three initiatives

1. Strategic Partnership with Educators in Minority-Dominated High Schools

In coordination with Dr. Timothy Knowles, Executive Director of the Center for Urban School Improvement and the Office of Academic and Social Supports of the Woodlawn High School, the science faculty and I will explore sensible collaborative avenues to align curricula with demands of modern technology and relevant scientific fronts. The goal is to enhance science education and better inspire and prepare high school students for a four-year college education in science and mathematics, and lifetime science or technical careers.

2. S.M.A.R.T.+ Projects at the University of Chicago

Early exposure to a research environment and attitudes can challenge the conventional impression of science as a "dull and difficult-to-swallow" subject. We will continue provide the regular S.M.A.R.T. program for high school students to visit the university and to realize the

excitements of new discoveries. For highly motivated and interested students, we will provide S.M.A.R.T.+ project positions at the university. Both tours and projects take full advantage of University sponsorship and echo the education goals of Woodlawn high school to explore new and innovative extracurricular exposures.

3. S.M.A.R.T.+Links to high school students and educators

To maintain the partnership with educators and students in Woodlawn High school, we will develop novel web-based communication tools to share knowledge and resources on campus science news, science education (we will work with the science teachers to identify and collect appropriate science demonstration videos). We will also provide an internet-based communication channel for fast “vis-à-vis science chats” and on-going and future outreach activity announcement. This project is synergetic with the Woodlawn High education plan to provide a laptop computer for every student (1:1 Laptop initiative and Digital Youth initiative) and a wireless (Wi-Fi) environment on campus.