

**Annual Report for Period:**05/2011 - 04/2012

**Submitted on:** 01/30/2012

**Principal Investigator:** Kuo, Yu-Ju .

**Award ID:** 0966206

**Organization:** Indiana U of Pennsylvania

**Submitted By:**

Kuo, Yu-Ju - Principal Investigator

**Title:**

Scholarships-Creating Opportunities for Applying Mathematics

### Project Participants

#### Senior Personnel

**Name:** Kuo, Yu-Ju

**Worked for more than 160 Hours:** Yes

**Contribution to Project:**

Carry out overall administration and interaction with NSF and other organizations;  
 Maintain S-COAM records and applicant records;  
 Develop recruitment material;  
 Coordinate recruitment and advertising activities;  
 Develop and update project website;  
 Screen applicants for eligibility;  
 Select scholarship recipients and determine required math courses for recipients;  
 Review students' progress;  
 Serve as a primary academic mentor for S-COAM;  
 Develop & update advising and curriculum guidelines;  
 Coordinate external speakers and workshops;  
 Coordinate annual scholarship banquet;  
 Develop surveys and distribute them to students from Qualtrics, a web-based survey software;  
 Research, select, order, and authorize purchase of supplies and materials

**Name:** Adkins, Frederick

**Worked for more than 160 Hours:** Yes

**Contribution to Project:**

Develop recruitment material;  
 Coordinate recruitment and advertising activities;  
 Develop and update project website;  
 Screen applicants for eligibility;  
 Select scholarship recipients and determine required math courses for recipients;  
 Review students' progress;  
 Serve as a primary academic mentor for S-COAM;  
 Develop & update advising and curriculum guidelines;  
 Coordinate external speakers and workshops;  
 Develop surveys;  
 Administer IUP-STEM group on Facebook;  
 Presented mid-award summary of outcomes at the 2012 Joint Mathematics Meetings in Boston.

#### Post-doc

#### Graduate Student

**Name:** Vargson, Jeffrey

**Worked for more than 160 Hours:** No

**Contribution to Project:**

provided clerical assistance by sorted incoming applications, creating and maintaining applicant files

**Undergraduate Student**

**Name:** O'Hara, Daniel

**Worked for more than 160 Hours:** No

**Contribution to Project:**

co-presenter for Scientific Visualization workshop

**Name:** Lamont, Ellen

**Worked for more than 160 Hours:** No

**Contribution to Project:**

co-presenter for Scientific Visualization workshop

**Technician, Programmer**

**Name:** Shyrock, Joe

**Worked for more than 160 Hours:** No

**Contribution to Project:**

setup and install computer and software in the student offices, install software in the computer laboratories purchased through S-COAM, and provide funds to extend MentorNet service to all students in the college

**Other Participant**

**Name:** DeStefano, Alisa

**Worked for more than 160 Hours:** No

**Contribution to Project:**

reviewed students' financial need eligibility for compliance with scholarship requirements

**Name:** Stossel, Paula

**Worked for more than 160 Hours:** No

**Contribution to Project:**

provided consultation on recruiting graduate students and distributed informational brochures on scholarship

**Name:** Husenits, Mike

**Worked for more than 160 Hours:** No

**Contribution to Project:**

provided consultation on recruitment and a contact list of prospective undergraduate students; also distributed informational brochures on scholarship

**Name:** White, Elaine

**Worked for more than 160 Hours:** No

**Contribution to Project:**

provided administrative and clerical support including software purchasing, travel reimbursement, and mail sorting

**Name:** Alarcon, Francisco

**Worked for more than 160 Hours:** No

**Contribution to Project:**

obtained furnishings and allocated office spaces for student cohort and as department chair referred students as potential scholarship recipients

**Name:** Stoudt, Gary

**Worked for more than 160 Hours:** No

**Contribution to Project:**

served on scholarship review committee

**Name:** Wisloski, Greg

**Worked for more than 160 Hours:** No

**Contribution to Project:**

served on scholarship review committee

**Name:** Burch, Kimberly

**Worked for more than 160 Hours:** No

**Contribution to Project:**

served on scholarship review committee

**Name:** Lattanzio, John

**Worked for more than 160 Hours:** No

**Contribution to Project:**

served on scholarship review committee

**Name:** Radelet, Dan

**Worked for more than 160 Hours:** No

**Contribution to Project:**

served on scholarship review committee, organized Mathematics Department colloquia, and recorded student participation in colloquia

**Name:** Maier, Christoph

**Worked for more than 160 Hours:** No

**Contribution to Project:**

chaired the internship committee, reviewed students' resumes, established internship opportunities, and gave a SAS workshop

**Name:** Anthony, Mark

**Worked for more than 160 Hours:** No

**Contribution to Project:**

provided presentation on career and internship opportunities for students in scholarship cohort and in the College of Natural Science and Mathematics

**Name:** Ritchey, Nathan

**Worked for more than 160 Hours:** No

**Contribution to Project:**

provided consultation on assessment practices and review of content for surveys

**Name:** DeStefano, Frank

**Worked for more than 160 Hours:** No

**Contribution to Project:**

provided consultation on recruiting graduate students and distributed informational brochures on scholarship.

**Name:** Janosko, Joann

**Worked for more than 160 Hours:** No

**Contribution to Project:**

registered the SIAM Journal in Applied Mathematics with the IUP electronic journal collection

**Name:** Donley, Edward

**Worked for more than 160 Hours:** No

**Contribution to Project:**

gave a series of two Mathematica workshops

**Name:** Chrispell, John

**Worked for more than 160 Hours:** No

**Contribution to Project:**

New Faculty in the Mathematics Department, a presenter at Career Panel

**Name:** Abrefa-Kodom, Kwasi

**Worked for more than 160 Hours:** No

**Contribution to Project:**

M.S. in Applied Mathematics Alumnus, employed by IBM, Houston, TX, a presenter at Career panel

**Name:** Jarrett, Ben

**Worked for more than 160 Hours:** No

**Contribution to Project:**

M.S. in Applied Mathematics Alumnus, employed by Federal Energy Regulatory Commission, Washington, DC, a presenter at Career Panel

**Name:** Rossman, Paul

**Worked for more than 160 Hours:** No

**Contribution to Project:**

M.S. in Applied Mathematics Alumnus, employed by Sheetz, a presenter at Career Panel

**Name:** Snavely, Deanne

**Worked for more than 160 Hours:** No

**Contribution to Project:**

introduced Dr. Browning and assist with recruiting community college students

**Name:** Ross, David

**Worked for more than 160 Hours:** No

**Contribution to Project:**

gave two presentations and met with students to share his experiences in industry and academia

**Name:** Browning, William

**Worked for more than 160 Hours:** No

**Contribution to Project:**

gave 3 presentations and answered students' questions about working in industry

## Research Experience for Undergraduates

### Organizational Partners

#### **Society For Industrial and Applied Math (SIAM)**

SIAM's Visiting Lecturer Program (VLP) offers a valuable resource to chairpersons, colloquium organizers, student chapters, and undergraduate/graduate advisors - a roster of applied mathematicians in academia, industry, and government who are able to speak to students on a variety of topics.

The Visiting Lecturers are experienced speakers who, in addition to their accomplishments in applied mathematics, have been recommended for their commitment to education and their ability to reach students.

Dr. David Ross, Rochester Institute of Technology, gave two presentations and an informational question and answer session for students.

Dr. William Browning from Applied Math, Inc., gave three presentations for the IUP community.

## **INFORMS**

The INFORMS Speakers Program is designed to provide access to excellent speakers who are experts in operations research and the management sciences.

A speaker will give two presentations and an informational question and answer session for students.

### **Sigma XI Scientific Research Society**

Sigma Xi Distinguished Lecturers communicate their insights and excitement to a broad range of scholars and to the community at large.

Dr. Laurie E. Locascio, Spring 2011 speaker, is the Chief of the Biochemical Science Division within the Chemical Science and Technology Laboratory, National Institute of Standards and Technology. She presented a lecture and an informational question and answer session for students.

Anthony Johnson from UMBC, will be the Spring 2012 speaker.

### **MentorNet**

MentorNet is the premiere and most experienced web-based e-mentoring program in the world.

In terms of use of personnel:

Each scholarship recipient has selected a mentor in engineering and science fields from MentorNet for one-on-one guided relationships regarding academic and career opportunities. Through the additional support from the College Technology fund, all students in the college have access to MentorNet's one-on-one mentoring service.

In terms of use of facilities, scholarship students utilize the organizations website:

Based on a series of questions, the MentorNet website searches and matches students with compatible mentors. Students use MentorNet website to network with other participants and review job postings.

### **Other Collaborators or Contacts**

IUP Career Development Center-Director Mark Anthony gave a presentation on career and internship opportunities for students in scholarship cohort and in the College of Natural Science and Mathematics.

IUP Office of Financial Aid- Alisa DeStefano reviews students' financial need eligibility for compliance with scholarship requirements.

IUP Office of Admissions - Director Mike Husenits provides consultation and contact list of prospective undergraduate students and distributes informational brochures on scholarship.

IUP Office of Financial Operations- Jack Zimmer and Tom Toia provide accounting services.

IUP School of Graduate Studies and Research- Director of Marketing and Recruitment Paula Stossel and Frank DeStefano provide consultation on recruiting graduate students and distributes informational brochures on scholarship.

College of Natural Science and Mathematics- College Technology Manager Joe Shyrock provided \$1500 support to extend MentorNet contract for all students in the College of Natural Science and Mathematics.

## Activities and Findings

### **Research and Education Activities: (See PDF version submitted by PI at the end of the report)**

Headings below are our project goals and objectives. Activities completed in Spring 2011 and Fall 2011 or scheduled to complete in Spring 2012 are listed under appropriate sections.

Increase numbers of students with majors or minors in Mathematics

? Increase recruitment of students attending the M.S program in Applied Mathematics at IUP through efforts focused on the Pennsylvania State System of Higher Education and regional colleges

- o Between Spring 2011 and Fall 2011

- \* In Spring 2011, Dr. Adkins attended the annual conference of Pennsylvania State System of Higher Education Mathematics Association (PASSHE-MA) at California University of Pennsylvania to distribute brochures and talked to potential students. Recruiting material were also posted on the bulletin boards at Pennsylvania State University.

Dr. Kuo attended the spring meeting of Allegheny Mountain Section of Mathematical Association of America (MAA) at Clarion University to distribute brochures to potential students.

- o Spring 2012

- \* Participated in the Graduate School Fair at the Joint Mathematics Meetings(JMM) in Boston

- \* Will participate in the spring meetings of PASSHE-MA and Allegheny Mount Section of MAA

- \* Recruiting trips to colleges in the PASSHE and regional colleges are planned for Spring 2012

- o Continuous Effort:

- \* Emails or brochures were sent to the chairs of related departments as well as the contact persons listed on various minority associations in Math and Science fields in Pennsylvania and nearby states.

- \* Brochures were provided to the Director of Marketing in the School of Graduate Studies and Research to advertise the program in various recruiting events.

- \* Emails, letters, and/or brochures were sent to IUP alumnus and lists of students who took GRE in PA and nearby states.

? Expand recruitment of STEM undergraduates from regional community colleges

- o Continuous Effort:

- \* Letters, emails or brochures were sent to the chairpersons of related departments in regional community colleges.

- \* Emails and letters were sent to transfer students from lists provided by the Office of Admission.

- \* Brochures were provided to Office of Admission to advertise the program in their recruiting trips.

- \* Emails will be sent to regional community colleges to invite faculty and students to attend workshops and invited talks.

? Increase retention of undergraduate students majoring in mathematical areas at IUP

- o Multiple emails were sent to students in the College of Natural Science and Mathematics with 3.0 GPA who were close to or at least at the junior standing; female and minority students also received additional emails announcing this scholarship opportunity.

Emails were sent to the chairs of departments in the College to

solicit qualified students and co-organize events. Various minority associations at IUP were contacted to advertise the S-COAM program; and brochures and flyers were delivered to their offices for display.

- o In Spring 2012, we plan to contact advisors or presidents of minority student clubs and schedule a short meeting with these organizations.

Strengthen academic environment for entire department

- \* Co-PIs determine math course requirements for each student after carefully reviewing each individual's academic schedule and mathematical background. Each recipient is required to take additional mathematics courses and participate in at least one workshop/colloquium per month.

- \* In monthly meetings, the cohort activities include: orientation name games, mock interviews, resume critiques, practice and critique of oral presentations, 3-minute self-introduction. Co-PIs also gave short presentations on decision makings and how to use WinEdt and LaTeX. During the Spring 2011 monthly meetings, six students practiced to give short oral presentations based on their research/class projects.

- \* The cohort also shares two office spaces, Stright Hall 205 and 219.

- \* Every student selects his/her own mentor through MentorNet based on his/her own career/demographic preferences.

- \* Workshops: All workshops are announced to the entire IUP community through email and through the daily campus bulletin.

- Spring 2011: Matlab I, Matlab II, Preparation for graduate schools and some professional entry-level jobs

- o Fall 2011: Mathematica I, Mathematics II, Scientific Visualization and Creating a Research Poster, Career Panel by three M.S. in Applied Mathematics alumni and a new mathematics faculty member.

- o Spring 2012: Matlab, WinEdt and LaTeX, Preparation for graduate schools

- o Invited Speakers: Presentations are advertised and open to the entire IUP community.

- o Fall 2011: Dr. William Browning, a SIAM visiting lecturer from Applied Mathematics, Inc., gave three presentations on October 12, 2011. Dr. Felix Famoye, co-sponsored by Mathematics Department and S-COAM, gave one presentation on November 17, 2011, and met with students to discuss aspects of his career on November 18, 2011.

- o Spring 2012: Dr. Irene Fonseca, President-Elect of Society for Industrial and Applied Mathematics, has agreed to visit IUP on April 20, 2012.

- o These three speakers give presentations on their cutting edge research in different areas of applied mathematics and statistics and share their work experience with students.

- \* S-COAM partially sponsored the IUP's annual spring Sigma-Xi lecture.

- \* S-COAM organized a field trip to Pittsburgh Supercomputing Center.

- \* S-COAM also sponsored IUP Undergraduate Scholar Forum and the Women in Mathematics, Science, and Technology Program by providing 'Best Computational Science Poster Award' for each event.

- \* Scholarship recipients' participation in conferences:

- o Spring 2011: Three graduate students gave a joint presentation at the 2011 spring meeting of Allegheny Mountain Section of MAA. One

graduate student and one undergraduate attended the meeting. One undergraduate student presented in Undergraduate Scholar Forum at IUP.

- o Summer 2011: One graduate student attended 2011 Joint Statistical Meetings in Miami Beach, FL. One undergraduate student participated a Research Experience for Undergraduate at Grand Valley State University in Summer 2011 and attended the annual summer meeting of MAA in Lexington, KY. Two graduate students completed their internships.

- o Fall 2011: Four students attended at least one conference and six students gave at least one presentation.

- o Spring 2012: One undergraduate student gave an oral presentation and a poster presentation at the JMM in Boston. Three graduate students will complete their internships. We anticipate students will attend additional conferences.

\* Five graduate students and 4 undergraduate students received financial support to attend regional, state-wide, or national conferences in between January 2011 and January 2012.

Ongoing broader impact

? Students will improve their communication and networking skills through participation in the monthly activities with mentors and peers.

- o In monthly meetings, the cohort activities include: orientation name games, mock interviews, resume critiques, 3-minute self-introduction, and practice and critique of oral presentations.

The cohort also shares two office spaces, Stright Hall 205 and 219.

- o A scholarship banquet was held on April 29, 2011. A total of 30 scholarship recipients from Mathematics Department and S-COAM and their invited guests came together to celebrate their accomplishments.

A total of 65 participants, including scholarship recipients, their invited guests, and faculty members attended the event.

- o MentorNet is an e-mentoring program matching students with professionals in science and engineering for one-on-one guided relationships. Every student selects his/her own mentor through MentorNet based on his/her own career/demographic preferences. With the additional support from the College Technology fund, all students in the college can use this service.

? Students will explore workforce and career options.

- o Brian E. Johnson, a Vice President at Swiss Reinsurance America Corporation, spoke to interested students about the actuarial profession in Spring 2011.

- o Invited speakers, Dr. Browning and Dr. Famoye, had either career related presentation or open forum to answer questions from students regarding their career.

- o Three alumni from the M.S. in Applied Mathematics program and one new mathematics faculty shared their experience with students in Fall 2011.

- o We offered informational workshops on preparation for graduate school in Spring 2011. We also plan to another informational workshop on applications to graduate schools in Spring 2012.

- o Faculty offered discussion on career opportunities for Upward-Bound students.

**Findings: (See PDF version submitted by PI at the end of the report)**

Increase numbers of students with majors or minors in Mathematics:



Among 13 new scholarship recipients in Fall 2011 and Spring 12, eight students majoring in science declared an additional major or minor in mathematics. The results from Fall 2011 survey show that 92% of 25 respondents indicated that monthly meetings improve their commitment to continue in their current academic programs.

Strengthen academic environment for entire department:

Outcome for Undergraduates

? All undergraduate recipients met the GPA requirement ( $>3.0$ ) and mathematics courses requirements for Spring 2011, Fall 2011, and Spring 2012 renewal.

? Two, two, and one undergraduate students in the cohort graduated in Dec. 2010, May 2011, and Dec. 2011, respectively. Two are currently pursuing graduate degrees in Economics and Environmental Science. The other three are currently employed by Eric Ryan Corporation, Seeds of Faith Christian Academy, and Cerner Company

Outcome for Graduate Students in the M.S. in Applied Mathematics program

? All graduate recipients in Spring 2011 met the GPA requirement ( $>3.2$ ) for Fall 2011 renewal.

? All graduate recipients, except 2, in Fall 2011 met the GPA requirement for Spring 2012 renewal.

? One graduated in Dec. 2010 and two in May 2011. One is currently in a Ph.D. program and one is employed by IBM.

Program Activities

o Among 17 students in Spring 2011, 15 students attended four or more workshops/colloquia/seminars. Six students attended at least one conference and five students gave at least one presentation outside of class. This active participation represents a change from students' self-reported prior attendance (with 13 of 17 students reporting they were unlikely or very unlikely to attend these events if not in the program).

o Among 26 students in Fall 2011, 24 students attended four or more workshops/colloquia/seminars and 10 students attended more than five. Four students attended at least one conference and six students gave at least one presentation outside of class. This active participation represents a change from students' self-reported prior attendance (with 19 of 26 students reporting they were unlikely or very unlikely to attend these events if not in the program).

o There were a total of 23 and 16 persons attending Matlab I and Matlab II workshops in Spring 2011, respectively. Among those, there were 5 and 3 faculty members.

o There were a total of 20 and 18 persons attending Mathematica I and Mathematica II workshops in Fall 2011, respectively. Among those, there were 5 and 4 students who were not in the S-COAM program.

o There are a total of 37 participants in Scientific Visualization workshop in Fall 2011. Among those, there were 18 non S-COAM students and two faculty participants.

o There were at least 80 students attending the Career Panel in Fall 2011.

o There were at least 240 and 35 persons attending Dr. Browning's general and advanced talks. The scholarship cohort students and 30 additional students also actively participated in Dr.

Browning's career session.

- o The results of the survey show that 90% of respondents indicated that participation in the scholarship cohort increased their ability to network with faculty.
- o The results of the survey show that 100% of respondents indicated that participation in the scholarship cohort increased their ability to network with other students.
- o The results of the survey show that 90% of respondents indicated that participation in the scholarship cohort increased their feeling of connection with other mathematics and science students.

Ongoing broader impact: Workshops created for the scholarship cohort were open to the university community.

? For Matlab workshops: there were 8 faculty members.

? For Mathematica workshops: there were 9 students who were not in the S-COAM program.

? For Scientific visualization workshop: there were 18 non S-COAM students and two faculty participants.

? There were at least 80 students attending the Career Panel.

? There were at least 240 and 35 persons attending Dr.

Browning's general and advanced talks. The scholarship cohort students and 30 additional students also actively participated in Dr.

Browning's career session.

Students in the program were asked to provide feedback on how the program impacted or changed their educational goals. Below are comments indicating the program's ongoing impact.

'This scholarship has impacted my career goals by making me take my upcoming graduation more seriously. ?

Listening to presenters discuss their personal careers, interviews, or which classes to take really encouraged me to take advantage of the time that I have left here to prepare myself.'

'I have attended some colloquia or workshops in the past, but not as many as I did this semester. ? In fact after I knew which talks I wanted to attend for my requirements, I realized how interesting they were and went to more than necessary.'

'One of my biggest fears with entering the workforce and applying for jobs is that I don't have anyone I am close to me that has undergone the same situation. I am the first person in my family to go to college ? it is hard when no one understands to give me pointers. Because of this, having my mentor has been wonderful.'

'? not only did the money greatly help, all of the requirements associated with this scholarship helped enhance my education as well.'

'this scholarship has made it possible for me to connect with my peers who have the same interests as I do, and it has given me skills that I think will be very valuable when I graduate and start a career.'

'Not only did being a participant in this scholarship raise my self confidence to apply to the REU, but now that I have attended the REU and MathFest, I can see myself doing more with my life.'

'Many people put a lot of hard work into ? this. I think that this

program is an amazing thing, and I hope it is able to continue to help students like me for a long time!

### **Training and Development:**

? Each recipient is required to take additional mathematics courses and participate in at least one workshop/colloquium per month.

? In monthly meetings, the cohort activities include:

orientation name games, mock interviews, resume critiques, and practice and critique of oral presentations, 3 minute self-introduction.

? Two Matlab workshops (Matlab I, Matlab II) and one workshop on preparation for graduate school were offered in Spring 2011. We also took several students to visit Pittsburgh Supercomputing Center in April, 2011. Two mathematical software workshops (Mathematica I, Mathematica II) and a Scientific Visualization workshop were offered in Fall 2011. We plan to offer Matlab, WinEdt/LaTeX, Graduate School Application workshops in Spring 2012. All workshops are announced to the entire IUP community through email and the daily campus bulletin.

? Dr. William Browning, a SIAM visiting lecturer from Applied Mathematics, Inc., gave three presentations on October 12, 2011. Dr. Irene Fonseca, President of Society for Industrial and Applied Mathematics, has agreed to visit IUP on April 20, 2012. These two speakers present their cutting edge research in different areas of applied mathematics and share their industrial work experience with students. The events are advertised to the entire IUP community.

? S-COAM also co-sponsored Dr. Famoye's visit in November 2011. Dr. Famoye gave one research presentation and a discussion session about his career as statistics professor and consultant.

? S-COAM also partially sponsored the IUP's annual spring Sigma-Xi lecture.

? Six recipients practiced giving short oral presentations based on their research/class projects in Spring 2011 monthly meetings in preparation for their participation in local/regional conferences. Three students gave presentations for their REU and internship experiences in the August, 2011 meeting. Four students are scheduled to practice their presentations in Spring 2012.

? Students will explore workforce and career options through career or advanced study related workshops.

### **Outreach Activities:**

The following activities are advertised and open to the entire IUP community.

? A series of two Matlab workshops were offered in Spring 2011. There were a total of 23 and 16 participants, respectively. Among those, there were 5 and 3 faculty members.

? A series of two Mathematica workshops and a Scientific Visualization Workshop were offered in Fall 2011. We plan to offer Matlab and WinEdt/LaTeX workshops in Spring 2012. There were a total of 20, 18, and 36 persons attending Mathematica I, Mathematica II, and Scientific Visualization workshops, respectively. Among those participants, there were 5, 4, and 11 students who were not S-COAM recipients.

? Dr. William Browning, a SIAM visiting lecturer from Applied

Mathematics, Inc., gave three presentations on October 12, 2012. Dr. Irene Fonseca, President of Society for Industrial and Applied Mathematics, has agreed to visit IUP on April 20, 2012. These two speakers give presentations on their cutting edge research in different areas of applied mathematics and share their industrial work experience with students. Invited speakers' presentations are advertised and open to the entire IUP community. There were at least 240 and 35 persons attending Dr. Browning's general and advanced presentations. The scholarship cohort students and at 30 additional undergraduates and faculty members also actively participated in Dr. Browning's career session.

? S-COAM co-sponsored Dr. Famoye's visit. There were over 100 students attending either the research presentation or the career discussion.

? S-COAM also partially sponsored the IUP's annual spring Sigma-Xi lecture.

? Three recent alumni of M.S. in Applied Mathematics and one new mathematics faculty member gave a career panel in Fall 2011 with at least 80 participants. We also plan to offer an informational workshop on application to graduate schools in Spring 2012.

? In April 2011, the Math Department and S-COAM program coordinated a scholarship banquet. A total of 65 persons including faculty member, scholarship recipients, and recipients' family members joined the banquet to celebrate students' achievements.

### Journal Publications

### Books or Other One-time Publications

Frederick Adkins and Yu-Ju Kuo, "Mentoring and Networking Mathematics and Science Majors in Applying Mathematics", (2012). Conference Presentation, Abstract Accepted, 2012 Joing Mathematics Meetings Bibliography: Adkins, Frederick, and Kuo, Yu-Ju. NSF S-COAM Annual Reports. Rep. Print.

### Web/Internet Site

**URL(s):**

<http://www.iup.edu/page.aspx?id=94513>

**Description:**

This site provides information for prospective applicants and current scholarship recipients. It also announces public events supported by the grant.

This page is linked from the Mathematics Department ([www.iup.edu/math](http://www.iup.edu/math)) by clicking on the S-COAM information section link.

### Other Specific Products

### Contributions

**Contributions within Discipline:**

**Contributions to Other Disciplines:**

**Contributions to Human Resource Development:**

1. The grant facilitates mentoring in science and engineering areas. Students are connected with working professionals via MentorNet to exchange questions and receive career advice.

2. By providing scholarships, the grant enables enhancement of the performance, skills, and attitudes of members of underrepresented groups thus improving their access to and retention in research and teaching careers. The grant supports students with scholarships in their pursuit of science and mathematics majors (26 supported students during Fall 2011 with 6 additional scholarship offers for the Spring 2012). Additionally one of these students graduated in December (one Bachelor's degree).

The cohort during Fall 2011 semester has 10 female students out of the total 26. The 6 additional scholarship offers issued for Spring 2012 and three are female students. There are two Asian American students in the cohort and one Latino American applicant without financial need.

As part of the scholarship program, supported students successfully complete additional mathematics course requirements which further their ability to pursue advanced studies, perform research, and to apply and incorporate more quantitative methods in their careers and/or teaching.

The grant also supports colloquia and workshops for the IUP community furthering participants' understanding and ability to utilize mathematics and science.

Students in the scholarship cohort improve their communication skills by giving research presentations and receiving peer feedback at monthly meetings.

3. The grant provides exposure to science and technology for non-scientist members of the public.

Scholarship recipients are asked to participate in an annual spring university-wide Scholar's Forum where they present their mathematical and scientific projects to the entire IUP community.

Students completing student teaching and internships expose the general public to mathematics and science.

**Contributions to Resources for Research and Education:**

The grant provides additional software (Lingo, WinEdt, Arena, Matlab) for IUP's computer laboratories expanding the ability to use state of the art packages in both education and research.

It also provides funding for the departmental membership of Society of Industrial and Applied Mathematics (SIAM) and SIAM Journal on Applied Mathematics.

**Contributions Beyond Science and Engineering:****Conference Proceedings****Special Requirements****Special reporting requirements:**

In another NSF report we have supplied demographic information and the scholarship amount for each recipient.

**Change in Objectives or Scope:** None

**Animal, Human Subjects, Biohazards:** None

**Categories for which nothing is reported:**

Any Journal

Any Product

Contributions: To Any within Discipline

Contributions: To Any Other Disciplines

Contributions: To Any Beyond Science and Engineering

Any Conference

## NSF-Report-Finding

Items in bold are our project goals. The findings are listed under relevant sections.

### **Increase numbers of students with majors or minors in Mathematics**

Among 13 new scholarship recipients in Fall 2011 and Spring 12, eight students majoring in science declared an additional major or minor in mathematics. The results from Fall 2011 survey show that 92% of 25 respondents indicated that monthly meetings improve their commitment to continue in their current academic programs.

### **Strengthen academic environment for entire department**

#### **Outcome for Undergraduates**

- All undergraduate recipients met the GPA requirement (>3.0) and mathematics courses requirements for Spring 2011, Fall 2011, and Spring 2012 renewal.
- Two, two, and one undergraduate students in the cohort graduated in Dec. 2010, May 2011, and Dec. 2011, respectively. Two are currently pursuing graduate degrees in Economics and Environmental Science. The other three are currently employed by Eric Ryan Corporation, Seeds of Faith Christian Academy, and Cerner Company

#### **Outcome for Graduate Students in the M.S. in Applied Mathematics program**

- All graduate recipients in Spring 2011 met the GPA requirement (>3.2) for Fall 2011 renewal.
- All graduate recipients, except 2, in Fall 2011 met the GPA requirement for Spring 2012 renewal.
- One graduated in Dec. 2010 and two in May 2011. One is currently in a Ph.D. program and one is employed by IBM.

#### **Program Activities**

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- There were at least 80 students attending the Career Panel in Fall 2011.
- There were at least 240 and 35 persons attending Dr. Browning's general and advanced talks. The scholarship cohort students and 30 additional students also actively participated in Dr. Browning's career session.
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- The results of the survey show that 100% of respondents indicated that participation in the scholarship cohort increased their ability to network with other students.
- The results of the survey show that 90% of respondents indicated that participation in the scholarship cohort increased their feeling of connection with other mathematics and science students.

#### **Ongoing broader impact: Workshops created for the scholarship cohort were open to the university community.**

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- For Mathematica workshops: there were 9 students who were not in the S-COAM program.
- For Scientific visualization workshop: there were 18 non S-COAM students and two faculty participants.
- There were at least 80 students attending the Career Panel.

- There were at least 240 and 35 persons attending Dr. Browning's general and advanced talks. The scholarship cohort students and 30 additional students also actively participated in Dr. Browning's career session.

*Students in the program were asked to provide feedback on how the program impacted or changed their educational goals. Below are comments indicating the program's ongoing impact.*

### **Student Quote**

*"This scholarship has impacted my career goals by making me take my upcoming graduation more seriously. ... Listening to presenters discuss their personal careers, interviews, or which classes to take really encouraged me to take advantage of the time that I have left here to prepare myself."*

*"I have attended some colloquia or workshops in the past, but not as many as I did this semester. ... In fact after I knew which talks I wanted to attend for my requirements, I realized how interesting they were and went to more than necessary."*

*"One of my biggest fears with entering the workforce and applying for jobs is that I don't have anyone I am close to me that has undergone the same situation. I am the first person in my family to go to college ... it is hard when no one understands to give me pointers. Because of this, having my mentor has been wonderful."*

*"... not only did the money greatly help, all of the requirements associated with this scholarship helped enhance my education as well."*

*"this scholarship has made it possible for me to connect with my peers who have the same interests as I do, and it has given me skills that I think will be very valuable when I graduate and start a career."*

*"Not only did being a participant in this scholarship raise my self confidence to apply to the REU, but now that I have attended the REU and MathFest, I can see myself doing more with my life."*

*"Many people put a lot of hard work into ... this. I think that this program is an amazing thing, and I hope it is able to continue to help students like me for a long time!"*



## NSF-Report-Activities

Items in bold are our project goals and objectives. Activities completed in Spring 2011, Fall 2011, or scheduled to complete in Spring 2012 are listed under appropriate sections.

### **Increase numbers of students with majors or minors in Mathematics**

- **Increase recruitment of students attending the M.S program in Applied Mathematics at IUP through efforts focused on the Pennsylvania State System of Higher Education and regional colleges**
  - **Between Spring 2011 and Fall 2011**
    - In Spring 2011, Dr. Adkins attended the annual conference of Pennsylvania State System of Higher Education Mathematics Association (PASSHE-MA) at California University of Pennsylvania to distribute brochures and talked to potential students. Recruiting material were also posted on the bulletin boards at Pennsylvania State University. Dr. Kuo attended the spring meeting of Allegheny Mountain Section of Mathematical Association of America (MAA) at Clarion University to distribute brochures to potential students.
  - **Spring 2012**
    - Participated in the Graduate School Fair at the Joint Mathematics Meetings(JMM) in Boston
    - Will participate in the spring meetings of PASSHE-MA and Allegheny Mount Section of MAA
    - Recruiting trips to colleges in the PASSHE and regional colleges are planned for Spring 2012
  - **Continuous Effort:**
    - Emails or brochures were sent to the chairs of related departments as well as the contact persons listed on various minority associations in Math and Science fields in Pennsylvania and nearby states.
    - Brochures were provided to the Director of Marketing in the School of Graduate Studies and Research to advertise the program in various recruiting events.
    - Emails, letters, and/or brochures were sent to IUP alumnus and lists of students who took GRE in PA and nearby states.
- **Expand recruitment of STEM undergraduates from regional community colleges**
  - **Continuous Effort:**
    - Letters, emails or brochures were sent to the chairpersons of related departments in regional community colleges.
    - Emails and letters were sent to transfer students from lists provided by the Office of Admission.
    - Brochures were provided to Office of Admission to advertise the program in their recruiting trips.
    - Emails will be sent to regional community colleges to invite faculty and students to attend workshops and invited talks.
- **Increase retention of undergraduate students majoring in mathematical areas at IUP**
  - Multiple emails were sent to students in the College of Natural Science and Mathematics with 3.0 GPA who were close to or at least at the junior standing; female and minority students also received additional emails announcing this scholarship opportunity. Emails were sent to the chairs of departments in the College to solicit qualified students and co-organize events. Various minority associations at IUP were contacted to advertise the S-COAM program; and brochures and flyers were delivered to their offices for display.
  - In Spring 2012, we plan to contact advisors or presidents of minority student clubs and schedule a short meeting with these organizations.

### **Strengthen academic environment for entire department**

- Co-PIs determine math course requirements for each student after carefully reviewing each individual's academic schedule and mathematical background. Each recipient is required to take additional mathematics courses and participate in at least one workshop/colloquium per month.
- In monthly meetings, the cohort activities include: orientation name games, mock interviews, resume critiques, practice and critique of oral presentations, 3-minute self-introduction. Co-PIs also gave short presentations on decision makings and how to use WinEdt and LaTeX. During the Spring 2011 monthly meetings, six students practiced to give short oral presentations based on their research/class projects.

- The cohort also shares two office spaces, Stright Hall 205 and 219.
- Every student selects his/her own mentor through MentorNet based on his/her own career/demographic preferences.
- Workshops: All workshops are announced to the entire IUP community through email and through the daily campus bulletin.
  - Spring 2011: Matlab I, Matlab II, Preparation for graduate schools and some professional entry-level jobs
  - Fall 2011: Mathematica I, Mathematics II, Scientific Visualization and Creating a Research Poster, Career Panel by three M.S. in Applied Mathematics alumni and a new mathematics faculty member.
  - Spring 2012: Matlab, WinEdt and LaTeX, Preparation for graduate schools
- Invited Speakers: Presentations are advertised and open to the entire IUP community.
  - Fall 2011: Dr. William Browning, a SIAM visiting lecturer from Applied Mathematics, Inc., gave three presentations on October 12, 2011. Dr. Felix Famoye, co-sponsored by Mathematics Department and S-COAM, gave one presentation on November 17, 2011, and met with students to discuss aspects of his career on November 18, 2011.
  - Spring 2012: Dr. Irene Fonseca, President-Elect of Society for Industrial and Applied Mathematics, has agreed to visit IUP on April 20, 2012.
  - These three speakers give presentations on their cutting edge research in different areas of applied mathematics and statistics and share their work experience with students.
- S-COAM partially sponsored the IUP's annual spring Sigma-Xi lecture.
- S-COAM organized a field trip to Pittsburgh Supercomputing Center.
- S-COAM also sponsored IUP Undergraduate Scholar Forum and the Women in Mathematics, Science, and Technology Program by providing "Best Computational Science Poster Award" for each event.
- Scholarship recipients' participation in conferences:
  - Spring 2011: Three graduate students gave a joint presentation at the 2011 spring meeting of Allegheny Mountain Section of MAA. One graduate student and one undergraduate attended the meeting. One undergraduate student presented in Undergraduate Scholar Forum at IUP.
  - Summer 2011: One graduate student attended 2011 Joint Statistical Meetings in Miami Beach, FL. One undergraduate student participated a Research Experience for Undergraduate at Grand Valley State University in Summer 2011 and attended the annual summer meeting of MAA in Lexington, KY. Two graduate students completed their internships.
  - Fall 2011: Four students attended at least one conference and six students gave at least one presentation.
  - Spring 2012: One undergraduate student gave an oral presentation and a poster presentation at the JMM in Boston. Three graduate students will complete their internships. We anticipate students will attend additional conferences.
- Five graduate students and 4 undergraduate students received financial support to attend regional, state-wide, or national conferences in between January 2011 and January 2012.

### **Ongoing broader impact**

- **Students will improve their communication and networking skills through participation in the monthly activities with mentors and peers.**
  - In monthly meetings, the cohort activities include: orientation name games, mock interviews, resume critiques, 3-minute self-introduction, and practice and critique of oral presentations. The cohort also shares two office spaces, Stright Hall 205 and 219.
  - A scholarship banquet was held on April 29, 2011. A total of 30 scholarship recipients from Mathematics Department and S-COAM and their invited guests came together to celebrate their accomplishments. A total of 65 participants, including scholarship recipients, their invited guests, and faculty members attended the event.
  - MentorNet is an e-mentoring program matching students with professionals in science and engineering for one-on-one guided relationships. Every student selects his/her own mentor through MentorNet based on his/her own career/demographic preferences.

With the additional support from the College Technology fund, all students in the college can use this service.

- **Students will explore workforce and career options.**

- Brian E. Johnson, a Vice President at Swiss Reinsurance America Corporation, spoke to interested students about the actuarial profession in Spring 2011.
- Invited speakers, Dr. Browning and Dr. Famoye, had either career related presentation or open forum to answer questions from students regarding their career.
- Three alumni from the M.S. in Applied Mathematics program and one new mathematics faculty shared their experience with students in Fall 2011.
- We offered informational workshops on preparation for graduate school in Spring 2011. We also plan to another informational workshop on applications to graduate schools in Spring 2012.
- Faculty offered discussion on career opportunities for Upward-Bound students.