Minnesota's Louis Stokes Alliance for Minority Participation Program

North Star STEM Alliance

NSF Impact Report, 2012

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I. Overview

The North Star STEM Alliance is a partnership of 16 Minnesota colleges and universities, the Minnesota High Tech Association, and the Science Museum of Minnesota. The Alliance is supported by the Louis Stokes Alliances for Minority Participation, NSF grant #0703356, and partner institutions. This report represents activity between June 1, 2007 and August 31, 2012 (New Alliance phase).

Program Goals

1. Double the number of African-American, Hispanic/Latino, Native American, Alaska Native, and Pacific Islander in Alliance institutions earning bachelor's degrees in science, technology, engineering, and math (STEM) within five years.
2. Build an alliance of institutions working toward the success of underrepresented minorities (URM) in STEM.
3. Foster institutional change toward greater diversity and inclusion.

Objectives:

1. Support student achievement via tutoring and supplemental instruction.
2. Engage students more deeply in their fields through faculty mentorship and research opportunities.
3. Build community through networking, peer mentorship, and student organizations.
4. Explore career directions at four-year colleges, in industry, and in graduate school.
5. Enhance the academic and collegiate climate for success of underrepresented students in STEM through faculty engagement, curriculum development, and institutional change.

Lead Institution: University of Minnesota Twin Cities

Principal Investigators:

Dr. Thomas Sullivan, Provost, 2007-08;
Dr. Nancy "Rusty" Barceló, Vice President and Vice Provost for Equity and Diversity, 2008-10;
Dr. Robert Jones, Senior Vice President for Academic Administration, 2010-12.

Co-Principal Investigators:

Paul J. Strykowski, Associate Dean for Undergraduate Programs, College of Science and Engineering;
Abel Ponce de León, Senior Associate Dean of Research and Graduate Programs, College of Food, Agricultural and Natural Resource Sciences;
Robin Wright, Associate Dean, College of Biological Sciences.

Program Director and Program Coordinator:

Anne Hornickel, Program Director, Office for Equity and Diversity
Simone Gbolo, Program Coordinator, College of Science and Engineering

impact.umn.edu

The U of M's Economic Impact in Minnesota

$8.6 billion
The U of M creates $8.6 billion in total economic impact annually.

- $4.1 billion for goods and services purchased by the U of M, its employees, students, and visitors
- $4.5 billion in spending by the businesses that provide those goods and services

$13.20
Every dollar invested in the U of M generates $13.20 in the statewide economy.

- The U of M generates more than $512.3 million in tax revenue annually.

79,497 jobs
The U of M supports 79,497 jobs.

- 42,319 jobs on U of M campuses:
  - Faculty and **staff:** 19,157 jobs
  - Fellows and students: 8,866 jobs
  - UMMC-Fairview/UMP: 8,017 jobs
  - Graduate assistants, post doctorates, and residents: 6,279 jobs
- 37,178 jobs in communities across the state

1 out of 43 jobs
The U of M is connected to one out of every 43 jobs in Minnesota.

5th
The U of M is Minnesota's fifth-largest employer.

1. State of Minnesota
2. Mayo Clinic
3. Federal government
4. Target Corporation
5. U of M

16,193 jobs
Scientific research funds competitively awarded to the U of M create $1.5 billion in total economic impact annually and support 16,193 jobs.

$8.9 billion
The U of M graduating class of 2010 will have an $8.9 billion impact on future increased earnings.

$823 million
U of M researchers won $823 million in competitive scientific research funding in 2010, up 36% from the previous year.

$390 million
U of M inventions brought Minnesota nearly $390 million in revenue in the last five years.

14,000
The U of M awards 14,000 degrees annually.

- 90% of Minnesota's STEM doctoral degrees
- 85% of Minnesota's MD degrees
- 100% of Minnesota's dentistry, pharmacy, and veterinary medicine degrees

500,000 jobs
U of M alumni have founded nearly 10,000 companies in Minnesota, according to alumni surveys, 2004-06.

- These companies employ 500,000 people and produce $100 billion in annual revenue.
- Nearly 25% of these founders moved to Minnesota to **attend** the U of M.

UNIVERSITY OF MINNESOTA
Driven to Discover℠

Overall Impact of Louis Stokes Alliance for Minority Participation Program:
The Minnesota LSAMP Program – North Star STEM Alliance has had a clear and positive impact on the Alliance institutions, the state, and STEM-affected industries beyond our institutions and Minnesota border. The voice that the LSAMP Project and underrepresented minority STEM students and graduates add to the debate and dialog inside and outside of the academy is transformational. Whether that voice is in the form of a different perspective offered on a topic in a classroom discussion or a salient point in a research paper or lab report, the impact is significant. Additionally, that voice may take the form of encouragement to prospective underrepresented minority students to remain persistent in their math/science courses in grade school and high school in order to be better prepared once they enter college. The voice could be a consolation to a discouraged STEM major who is beginning to doubt his or her choice of a STEM major and career. The list of positive contributions this new and growing voice manifests is endless. The impact should inform and guide the academy and the workplace as they both grow to include more underrepresented minority STEM students and practicing professionals.

The increased number of STEM graduates and new STEM underrepresented minority students also leverages the overall number of STEM professionals available for the workplace. This increased availability enables our state to better meet the projected workplace needs for STEM professionals. An expanded local pool of trained STEM professionals lowers the talent acquisition costs to our state and private sector employers, while increasing projected tax revenues for local and state municipalities.

Minnesota's challenge is that it has one of the largest gaps of all states between achievement test performance of students from underrepresented groups (African American, Latino, and American Indian) and white students. The achievement gap is intrinsically linked to socioeconomic status, appears during preschool, and persists across the school years, resulting in a relatively limited pool of underrepresented students ready for STEM programs. To date, our LSAMP Program graduates earn substantial salaries, which allow them to support their immediate and extended families and communities, thus transforming these families' views of college degrees and STEM education. The successful increase of STEM professionals from underrepresented backgrounds has begun to create a critical mass of underrepresented STEM professionals and students in Minnesota. In turn, this critical mass attracts others to follow suit, attracting others to come to Minnesota and participate in the North Star STEM Alliance at the UMN, specifically for post-baccalaureate STEM studies.

In response to the achievement gap, the North Star STEM Alliance partners have worked to complement the LSAMP Program-supported work, strengthening preK-12 preparation for underrepresented minority students.

Programs include:

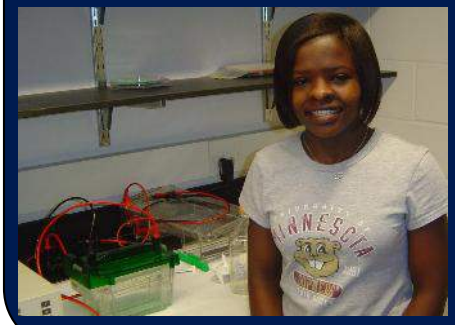
1. A statewide College Access Network coordinated by the Minnesota Minority Education Partnership;
2. The University of Minnesota STEM Education Center focused on how young people learn about STEM issues, how better to prepare teachers to teach STEM issues to all their students, and how to integrate STEM fields for teaching young people about STEM issues
3. A University of Minnesota College Readiness Consortium working with high schools on college readiness issues
4. The Minnesota STEM Network expansion across the state to address achievement gap issues in STEM as well as attract more students to STEM
5. A range of research studies by individual investigators working across the age continuum to infuse stronger STEM approaches and to teach inquiry processes and science knowledge within a K-12 curriculum that has been strongly focused on reading and mathematics

Our North Stars...

Lucas Caretta

Lucas, now a senior in materials science and engineering at the UMN-Twin Cities, has a number of accolades: Best Poster at the 2010 Society of Hispanic Professional Engineers (SHPE) annual conference in Cincinnati, Ohio, Best of Session in Poster Presentation at the 2011 Winchell Symposium, a local undergraduate research symposium hosted by the Minnesota Academy of Sciences. He has also earned awards as the President's Distinguished Faculty Mentor Program Outstanding Scholar Award, in on the College of Science and Engineering Dean's List, won first place in the Case Study Competition at the National Institute for Leadership Advancement, received the Exxon Mobil LOFT Fellowship Award and Exxon Mobil Materials Engineering Internship offer (summer 2012). In summer 2011, he completed an internship at Boeing Company in Research and Technology, 737 Product Support. He recently was admitted to the Dow-Massachusetts Institute of Technology ACCESS Program. As a student leader he serves as Co-President, Material Advantage Chapter at the University of Minnesota, the Vice Regional Student Representative, SHPE Region 6, and President of the University of Minnesota SHPE chapter.

Our North Stars...

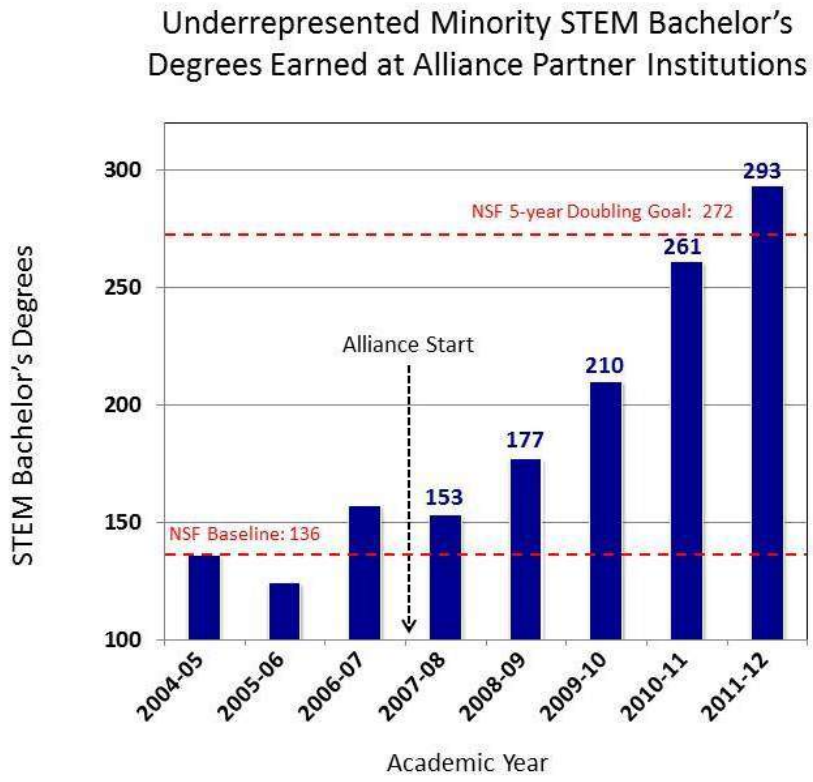


Beryl Ombaso

Beryl completed a B.S. in Chemistry at the UMN-Twin Cities in 2010. She excelled in research in Professor Edgar Arriaga's chemistry laboratory, and after graduation enrolled in the graduate pharmacology program. To everyone's deep sadness, Beryl died of natural causes one month into her graduate program. The Alliance now gives an award for service in her honor at the spring symposium.

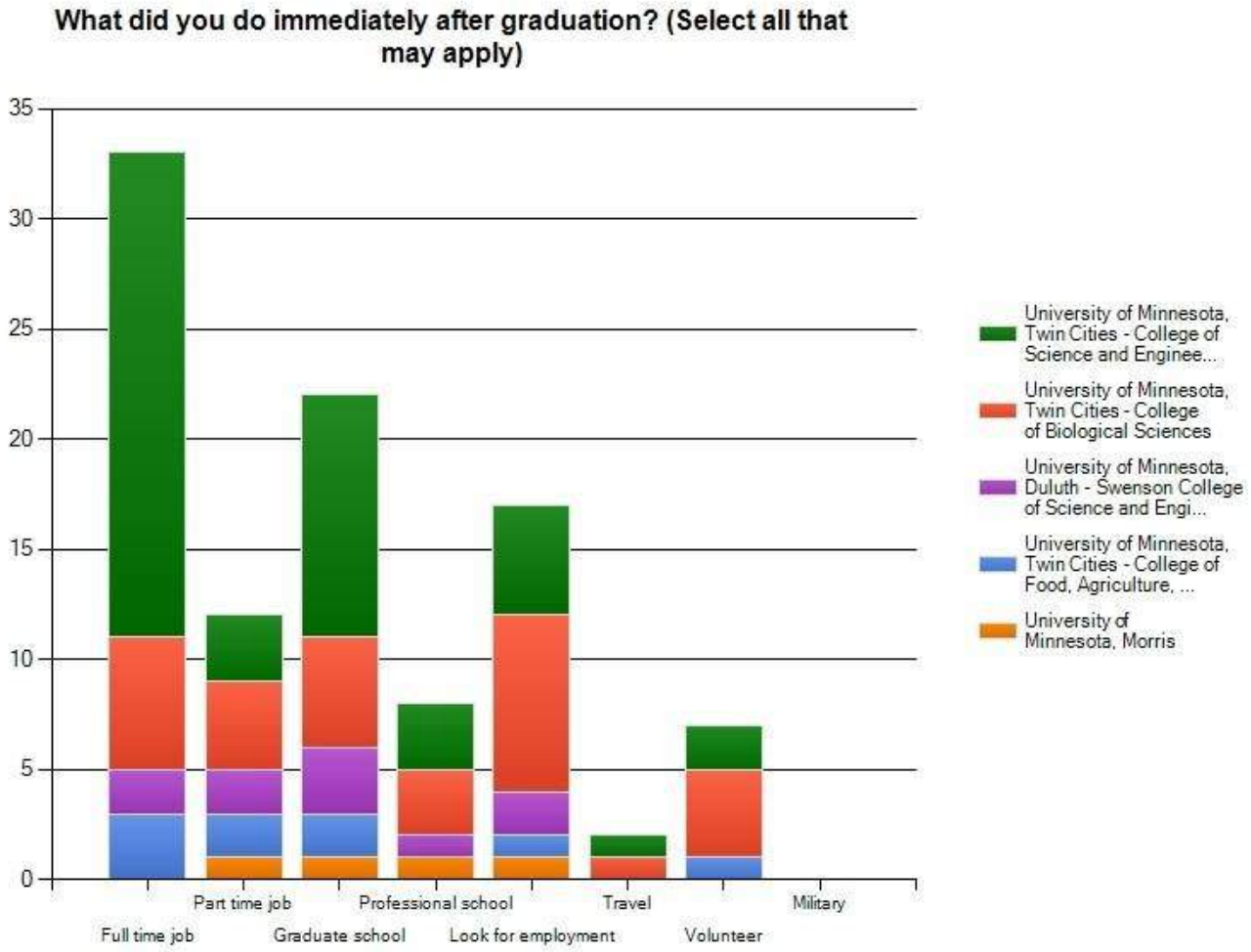
Underrepresented Minority (URM) STEM Graduates

The number of underrepresented graduates receiving STEM degrees has increased 115% between the 2004-2005 baseline of 136 graduates and year 5 (293 graduates). The total number of underrepresented STEM graduates during Phase is 1,094 across the Alliance.



Post-baccalaureate activities

Underrepresented STEM graduates from the University of Minnesota STEM colleges (2008-2010) were surveyed about their post-baccalaureate activities (86 responses out of 320 contacted; 28% response rate). The following chart shows the type of activity they pursued after graduation. Of those entering employment, 91% were employed in STEM fields.



Our North Stars...

Abdou Harissou Ouro Bang'na Nassam

Harissou completed his Bachelor of Civil Engineering degree from UMN-Twin Cities in 2010. He became the first North Star STEM Alliance student to enter the Bridge to the Doctorate program. He is enrolled in the New Mexico State University graduate program in civil and environmental engineering. Harissou has helped other students become aware of this opportunity following his involvement in the LSAMP Program.

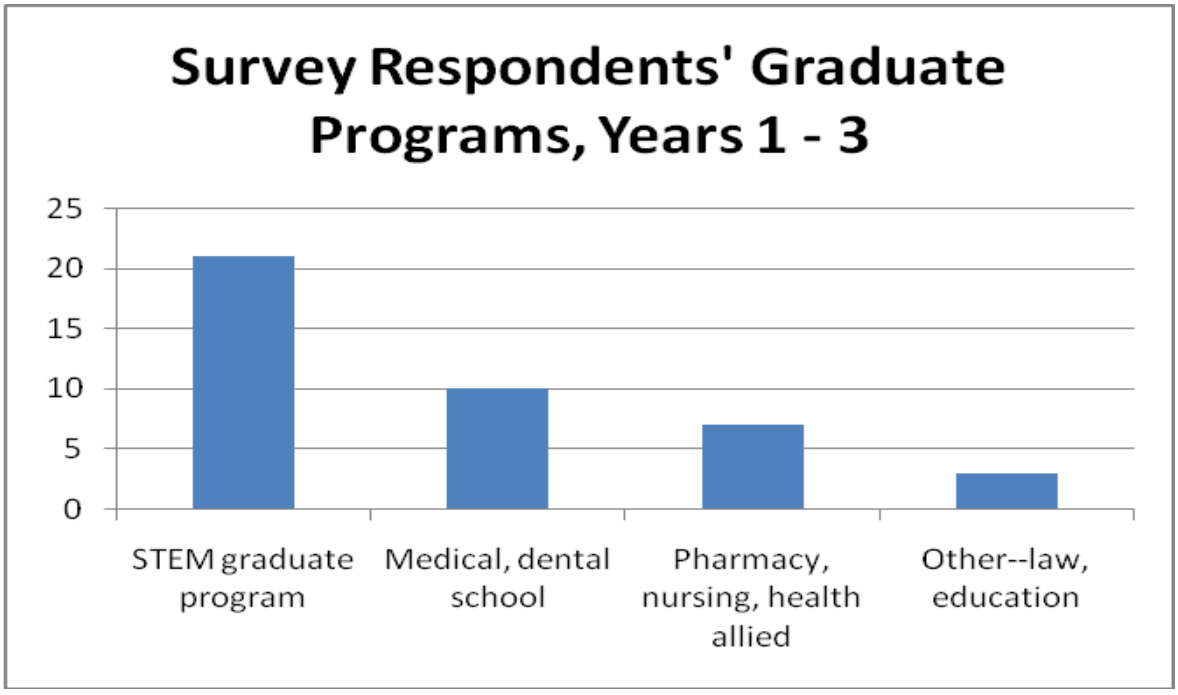
Our North Stars...

Andres Santiago Padron

Andres completed a Bachelor of Aerospace Engineering and Mechanics at the UMN-Twin Cities in 2010. He excelled at the University of Minnesota's College of Science and Engineering and is now enrolled in the Ph.D. program at Stanford University.

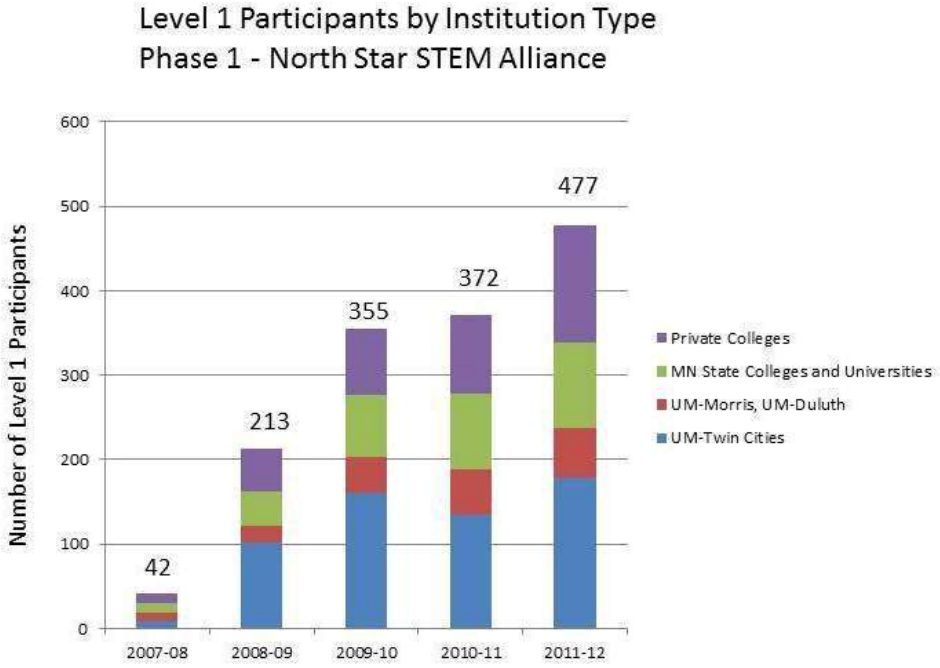
Post-baccalaureate education

Since 2007-08, at least 20 students from the University of Minnesota have enrolled in a graduate program in STEM. The post-baccalaureate activity survey of underrepresented STEM graduates (2008-10) revealed that 43 (50%) continued into graduate education in STEM; medical, dental, or a health professional school; law school; or graduate program in education. Very likely more students have gone onto graduate education considering this strong response. Three students from Augsburg have enrolled in graduate school in the last two years.



Engagement as Level 1 Alliance students:

Level 1 students (students receiving direct funding via stipend, wage, or travel expenses) over the past five years of the Alliance has increased substantially.



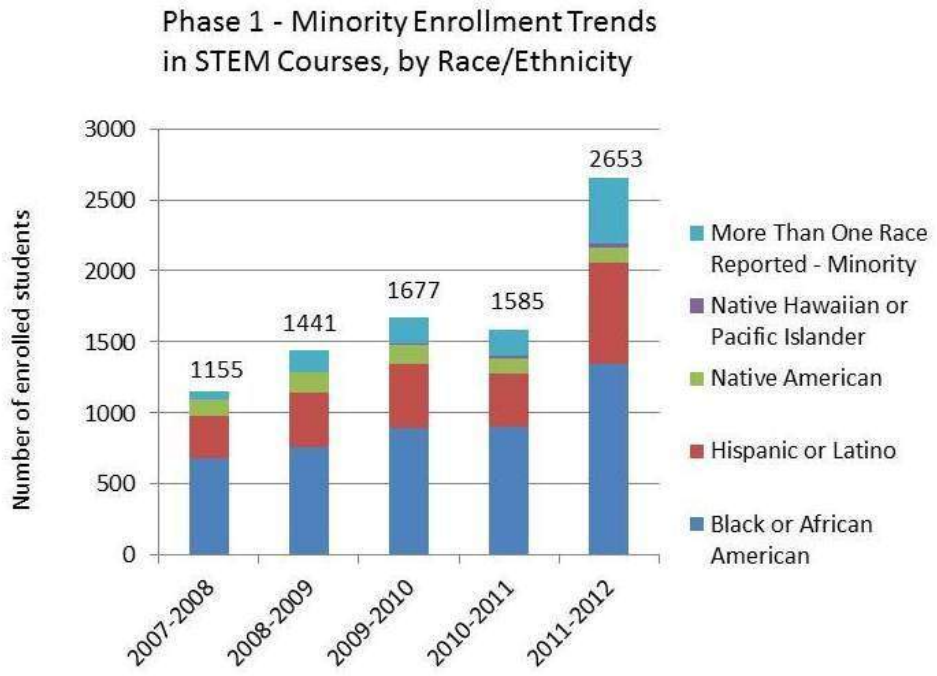
Our North Stars...

James Rodriguez

James completed a Bachelor of Biomedical Engineering degree from the UMN-Twin Cities in 2010. He reestablished the Society for Hispanic Professional Engineers student chapter, and in the same year, the chapter hosted the 2010 regional SHPE conference. He was also the lead peer mentor for the First-Year Scholars cohort and led the biweekly lunches. The alliance leadership at UMN-Twin Cities nominated James to receive the President's Student Leadership and Service Award for his outstanding service to the Alliance in 2009-10. In May, 2010 James accepted the award, a University of Minnesota system-wide honor.

Enrollment:

Enrollment of underrepresented students in STEM has increased for each ethnicity except for Native Americans between 2007-08 and 2011-12: African-American (96%); Hispanic/ Latino (145%); Native American (–5%); Native Hawaiians (1350% -from 2 to 29 students); more than one race/ethnicity (650%).



North Star students attending the 2010 Fall Kick-Off at the Science Museum of Minnesota in Saint Paul.

North Star STEM Alliance Best Practices

Undergraduate Research

Undergraduate research is the Alliance's most significant best practice in retention because it provides a well-rounded professional development experience: deeper content knowledge, passion for STEM, and a network of STEM professionals and mentors. Many Alliance first- and second-year students take a seminar which prepares them for undergraduate research. In the first five years of the Alliance, 256 students participated in undergraduate research.

Community Building

Students are invited to join cohorts as first-year students, transfer students or by college. Student organizations such as the Society of Hispanic Professional Engineers, the National Society of Black Engineers, and the American Indian Science and Engineering Society (AISES) provide important support for underrepresented students. The North Star AISES Alliance, giiwed'anang, brings together Native American students in STEM across Minnesota for retreats twice per year.

Group Study and Supplemental Instruction

Participation in study groups and supplemental instruction is a primary strategy for increasing academic achievement and building community.

Faculty and Peer Mentoring

Faculty and peer mentoring helps students feel a greater belonging to their campus. For example, four Century College faculty meet with their students several times per semester. Peer mentoring helps students learn expectations for course work, acclimate to campus, and locate resources. New transfer students meet with University of Minnesota peer mentors in a transfer cohort group to build new networks at the university.

Professor Rebekah Dupont leads a calculus supplemental instruction course at Augsburg College for underrepresented STEM students.

Professional Development

The Alliance provides professional development opportunities such as presenting research at professional meetings, meeting with STEM professionals at Minnesota High Tech Association events, and participating in internships, career fairs, and courses on preparing for graduate school. In years 1-5, 438 Alliance students have traveled to 57 national STEM meetings and conferences, introducing them to much larger cultural communities within STEM fields.

Summer Bridge

The Summer Bridge program at St. Olaf College and UM Morris gives students a head start on experiencing college coursework, building relationships, and getting comfortable with campus life.

James Rodriguez leads a cohort of students to the 2009 Society of Hispanic Professional Engineers conference.

Scholar and Fellow Programs

Underlying these best practices are the *Scholar and Fellow Programs* which provide the means for earning stipends and wages when engaged in the best practices. *The Scholar Program* engages students more deeply in their academic disciplines. Scholars participate in three aspects of community building and professional development: group study; small local cohorts; and larger underrepresented community activities such as Alliance-wide events, national meetings, or industry events. They also write a reflection on what they learned or experienced in order to receive a stipend. *The Fellows Program* builds community among underrepresented students. The Fellows are employed as peer mentors and tutors helping students successfully navigate STEM gateway courses; as recruiters of more Scholars or prospective students; as role models and mentors at outreach events; as leaders of student cohorts attending conferences; and as coordinators of STEM activities.

II. University of Minnesota—Twin Cities

Since its founding in 1851, the University of Minnesota has grown to become one of the largest public institutions in the nation. The University has over 4,000 faculty serving over 40,000 undergraduates and 25,000 graduate students. As a land grant institution, it has a commitment to providing an education to students of all income levels and an investment in agricultural research and development. Science, applied science, and engineering span four colleges on the Minneapolis and St. Paul campuses: College of Science and Engineering, College of Biological Sciences, College of Food, Agricultural and Natural Resource Sciences, and the College of Liberal Arts. Numerous research institutes connect these disciplines in research across the science and technology spectrum. The University's strategic plan is focused on becoming one of the top three public research institutions in the nation.

The University of Minnesota's strategic positioning process, known as "Transforming the U," has set in motion a journey toward the uppermost tier of public research universities. New energy around that journey is revitalizing people, projects, and programs across the University system.

With this goal in mind, the University's Office for Equity and Diversity (OED) was repositioned in 2006 as an institutional asset at the highest level. This repositioning recognized and reaffirmed the critical and central role that equity and diversity work have played, and will continue to play, in the University's transformation. It also demonstrated the University's recognition that only by fully embracing the highest ideals of access, equity, and inclusivity will any institution successfully transform itself.

In proposing a model for reimagining and reframing equity and diversity, the University of Minnesota academic community aspires to become:

1. A transformed university whose unrivaled excellence in research is driven by a multiplicity of peoples and cultures, ideas, perspectives, and knowledge systems.
2. A university where the possibilities for learning and achievement are broadened, advanced, and sustained by interconnected communities of students, faculty, and staff representing the broadest possible range of cultures, experiences, backgrounds, and perspectives.
3. A university whose organizational strength and agility are enhanced and sustained by the strategic alignment of institutional goals with equity and diversity goals.
4. A civically engaged university that builds strong, transformative relationships with diverse communities and sustainable, mutually beneficial community-based research, outreach, and teaching programs.
5. A generative and transformative educational and professional climate.

<u>LSAMP Program Impact—UM Twin Cities:</u>

Cohorts

UM-Twin Cities has established robust cohort groups for first-year students, transfer students, and biweekly gatherings for all underrepresented STEM students. North Star Fellows lead these cohort groups. The First Year Scholars cohort entails group study. Other students join study groups through a close collaboration with the Multicultural Center for Academic Excellence.

Preparation for Research Workshops

A preparation for research workshop offered in each STEM college has removed barriers for Underrepresented Minority (URM) STEM students, leading to substantial growth in the number of students engaged in undergraduate research.

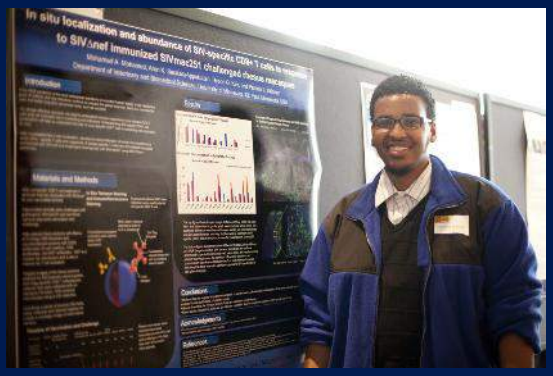
Student Leadership and Employment

The UM Twin Cities program has developed 81 leaders through peer mentoring and outreach roles in the past four years, and the overall program has grown dramatically based on our engaging student leaders.

Travel to National Professional Meetings
UM Twin Cities Underrepresented Minority STEM students travel to about a dozen professional meetings each year. Since exposure to large communities of STEM professionals and students has had transformative impact on many of our students, travel to professional meetings is a key best practice in retention.

New Student Organizations
In spring 2009, the Alliance helped to re-establish the student chapter of the Society of Hispanic Professional Engineers (SHPE) by sending its vibrant leader, James Rodriguez, to a SHPE regional meeting. The chapter is now led by other strong leaders who have grown through the Alliance program. The chapter also hosted a regional SHPE meeting in April, 2009, bringing approximately 120 Hispanic Latino STEM students and 25 professionals to the UMN -Twin Cities campus. This was the largest regional SHPE conference in Region 6 history at the time.

Our North Stars...



Mohamed Mohamed

A graduate of the University of Minnesota College of Biological Sciences, Mohamed majored in Genetics, Cell Biology & Development. He has conducted a significant amount of work as a Undergraduate Research Assistant at the University of Minnesota-Twin Cities in the Department of Veterinary and Biomedical Science. In summer 2011 he was an NSF Undergraduate Fellow in the Department of Neurological Surgery at University of Wisconsin School of Medicine and Public Health in Madison. In the summers of 2009 and 2010 he was an NSF Undergraduate Fellow in the Department of Neurobiology at Duke University Medical Center in Durham, NC. In fall 2011 he presented his research at the Society for the Advancement of Chicanos and Native Americans in Science conference.

Additionally, a new student organization, Innovative Engineers, developed and led by North Star Fellow Alejandro de la Mora, is developing wind power for villages in Central America. Alejandro was honored with a President's Leadership Award in May 2011.

Outreach

Outreach, supported by the College of Science and Engineering, engages the North Star Fellows in meeting underrepresented high school students interested in STEM.

1. North Star Fellows served as informal presenters and role models to the youth visitors and their families attending the Science Museum of Minnesota annual cultural events: African Americans in Science Day; American Indians in Science Day, and Amantes de la Ciencia. Each spring, the forum events introduce approximately 3000 youth and families to underrepresented leaders in academia and industry.
2. Youth Science Center program teams—UM Twin Cities North Star fellows mentor about 15 URM high school students per year.

U of M mascot Goldy Gopher gets a lesson in circuitry led by SHPE at a STEM outreach event.

3. After-school mentoring programs bring high school students to campus to meet informally with Alliance fellows, reaching 145 students in Phase 1.
4. North Star STEM Alliance is represented annually at the "Thinking College Early" fair at St Paul's Harding High School. Alliance partners including North Hennepin Community College, Century College, Augsburg College, and Minneapolis Community and Technical College all promoted the LSAMP program.
5. SHPE members attended a college fair at Cristo Rey Jesuit High School, a predominantly Hispanic high school in Minneapolis. In addition, SHPE members also visited several local high schools including El Colegio to talk with students about college life and university opportunities.
6. North Star Fellows from the National Society for Black Engineers (NSBE) hosted 100 8th-12th graders from Anwatin Middle School for a day of exploration in science and engineering labs and facilities. NSBE also annually hosts high school students from North Community High School in Minneapolis for a day during spring break to show the students research labs in science and engineering.
7. Over four Saturday workshops, the student organization Innovative Engineers, led by North Star Fellow Alejandro de la Mora, involved high school students from the Youth Science Center at the Science Museum of Minnesota in developing wind power for villages in Central America.

Institutional Change—UM Twin Cities

Dr. Barceló, Dr. Robert Jones, (PI 2010–12), and co-Principal Investigators Paul Strykowski, Abel Ponce de León, and Robin Wright and are building connections among initiatives across the University of Minnesota that specially serve underrepresented or disadvantaged populations of students: the North Star STEM Alliance students, low-income students receiving free tuition, first-generation college students, low-to middle-income students on scholarships, students needing supplemental academic preparation, and students with disabilities. This effort is raising faculty and administrators' awareness of these students in terms of academic success, retention and graduation rates, and services rendered to them, and has led to coordinating efforts across programs and colleges.

Principal Investigator (2008-2010) Nancy 'Rusty' Barceló, Vice President and Vice Provost for Equity and Diversity, led the Reimagining Equity and Diversity strategic planning initiative across the University of Minnesota campuses summarized on page 14. Through this work, the Office of Equity and Diversity connected with administrators and faculty in each college about implementing top priorities in the strategic plan (www.academic.umn.edu/equity). This overall strategic initiative complements and supports the work of the North Star STEM Alliance, bringing a focus to underrepresented students in STEM across the colleges.

The College of Food, Agricultural and Natural Resource Sciences (CFANS) has worked extensively to develop a collegiate diversity plan and implementation process (www.cfans.umn.edu/diversity/diversity_plan.htm). The diversity team of administrators, staff, and faculty are addressing all aspects of research, education, and service in transforming CFANS into a college that truly embraces diversity and excellence. The Committee on Diversity and Inclusion led by Karl Lorenz is active in integrating diversity and inclusion into the curriculum as CFANS restructures its majors and curricula. The college awards two grants of up to $15,000 to its departments as opportunities for curriculum development. The grants support developing systemic change in the curriculum by identifying essential strategies for infusing diversity and multicultural perspectives into the curriculum. As further commitment to multicultural curriculum, CFANS will introduce a new minor in 2010 exploring Indigenous Environmental Knowledge in collaboration with the White Earth Reservation and other local community organizations. The minor is comprised of 17 credits of coursework taken mainly through CFANS and American Indian Studies. Students will also complete a service learning project as part of the minor.

Curriculum Development

Mark Bellcourt, Ed.D., Senior Academic Advisor–College of Education and Human Development Student Services and Access To Success Coordinator–CFANS Diversity Office, is preparing a May 2011 global seminar on Maori peoples' knowledge of the land and is establishing relationships between the University of Minnesota and two major research institutions in New Zealand to foster future collaborations in academics and

research. The seminar will introduce students to the indigenous approaches of the Maori people and their knowledge of the land. The program will explore their decentralized culturally sensitive educational model that is inclusive of families, community elders, and professional educators.

Underrepresented minority STEM graduates, years 1-5, cumulative: 615
Phase I Level I (directly funded) Students, years 1-5: 600
Phase I Students engaged in undergraduate research: 96
Program support through Phase I, year 5: $508,719
Less expenses of alliance management: $205,997
Net program support: $302,722
Proportion of program support as wages to underrepresented undergraduates: $99,250
Leveraged work study income: $21,841
Participant support through Phase I, year 5: $556,034
Total support to underrepresented students: $677,124
Indirects: $220,162
Total NSF support to the University of Minnesota-Twin Cities, Years 1-5, not factoring in subawards: $1,284,915
Students advancing to graduate school: minimally 28, 16 in STEM graduate school based on survey of 320 URM STEM graduates of UMN campuses (86 respondents; 27% rate)

III. Alliance-Wide Programs

Kick-Off: Underrepresented students across the Alliance appreciate the Kick-Off as an opportunity to meet peers and faculty mentors. This popular event now in its fourth year attracts more than 250 participants. The students find out about research opportunities across the Alliance, discuss transfer admissions with college admissions counselors, and learn from students who have experienced research and internships.

Augsburg students at the 2010 Kick-Off event at the Science Museum of Minnesota.

Student Research Symposium: The special symposium for URMs in STEM now in its fourth year attracts more than 150 participants and features 35 undergraduate researchers. Each year a keynote is presented by a faculty member of color: *Spring 2009*—Cornell University professor Eloy Rodriguez; *Spring 2010*—UMN faculty of color panel presentation featuring Edgar Arriaga, UM Twin Cities, chemistry; Annette Lee, St. Cloud State University, astronomy; Rhonda Franklin, UM Twin Cities, electrical engineering; Sean Garrick, UM Twin Cities, mechanical engineering; Stephanie Schmidt, St. Olaf College, environmental sciences; *Spring 2011*—Eric Jolly, President of the

Science Museum of Minnesota. Special presentation, *Spring 2009*—Gregory Cajete on Native American Knowledge in Science.

Ben Fossen presenting his research at the North Star STEM 2011 Student research symposium.

North Star AISES Alliance (giiwed'anang): The North Star STEM Alliance works in conjunction with two University of Minnesota research centers: the National Center for Earth Dynamics (NCED) and the Center for Compact and Efficient Fluid Power (CCEFP). The purpose of this relationship is to coordinate, sponsor, and host all activities of the giiwed'anang North Star AISES Alliance. giiwed'anang is a collaboration of partner campuses with American Indian Science and Engineering Society (AISES) student chapters. Students attend AISES meetings together and special retreats that build community among Native American students studying STEM disciplines. Since the beginning of the Alliance, giiwed'anang has held 10 retreats where students gather, network, share academic and career goals, set the agenda and purpose for the Alliance, and work to build a greater network of undergraduate Native American students in STEM across Minnesota.

Native Skywatchers: Annette Lee, assistant professor in Astronomy, Physics and Engineering Science at St. Cloud State University, has developed a new seminar and course called Native Skywatchers. Lee's research, supported in part by the Alliance, makes contact with elders among native tribes and record and documents native peoples' star knowledge. She has incorporated this ancient wisdom into five seminar presentations and presented them at Alliance partner schools with the highest Native American STEM student populations (UM Twin Cities, UM Morris, UM Duluth, St. Cloud State, and a giiwed'anang retreat). The research has also been incorporated into an introductory astronomy course at St. Cloud State University, and also likely at Fond du Lac Tribal and Community College.

Industry Tours: 3M gave 35 Alliance students a tour of their research labs at the corporate headquarters in Maplewood, Minnesota in 2009. In spring 2010, Thomson Reuters hosted students at their Eagan, Minnesota facility. In year 5, tours at six sites including 3M and Thomson Reuters served 145 students from five partner campuses.

<u>Faculty Development</u>

Professor Fernan Jaramillo of Carleton College presented his work with team-based learning, based on the model proposed by Larry Michaelson. Carleton College and St. Olaf College co-sponsored a 1.5-day workshop with Larry Michaelson on team-based learning.

The Alliance implemented the Intercultural Development Inventory (IDI) for steering committee and governing board members. The inventory is a statistically reliable, cross-culturally valid measure of intercultural competence http://www.idiinventory.com/about.php. This work established a baseline for Alliance leadership and indicated appropriate options for future diversity training and interventions. In addition, four campuses each engaged about ten faculty and administrators to carry out the IDI assessment and train in the Developmental Model of Intercultural Sensitivity.

IV. Partner Institutions-University of Minnesota Coordinate Campuses

University of Minnesota-Duluth
Duluth, Minnesota

The University of Minnesota Duluth (UMD) is a comprehensive regional university. Undergraduate students can choose from 13 bachelor degrees in 78 majors. Providing an alternative to both large research universities and small liberal arts colleges, UMD attracts students looking for a personalized learning experience on a medium-sized campus of a major university. UMD's fall 2008 enrollment was 11,366 with approximately 38% of the students from the Twin Cities area and an additional 49% from the rest of Minnesota.

Diversity Goals and Program: UM Duluth has approved a refined vision, mission, statement of core values, and a manageable set of goals and action steps which includes the goal of creating a positive and inclusive campus climate for all by advancing equity, diversity, and social justice. To support, advance, and embed social justice values of inclusion, equity, and diversity into the fabric of the University of Minnesota Duluth, the Campus Change Team has organized its efforts around these objectives: improving campus climate and intergroup relations; recruiting and retaining a diverse student body and faculty; developing curricula, pedagogies, and research that foster inclusivity, accessibility and cultural competencies; and developing leadership and management capacity around equity and diversity work.

UM Duluth has engaged students in group study, undergraduate research, cohort groups, and attendance at national professional conferences.

LSAMP Program Impact—UM Duluth:
Underrepresented minority STEM graduates, years 1-5, cumulative: 64
Level 1 (directly funded) Students, years 1-5: 94
Students engaged in undergraduate research through Phase 1, year 5: 4
Program support through Phase 1, year 5: 46,422

Proportion of total program support as wages to undergraduates: $23,074
Participant support, Phase 1, year 4: 60,369
Total support to undergraduates: $83,443
Program Indirects: $13,681
Total support to UM Duluth: $120,472
Students advancing to graduate school: minimally 7, 3 in STEM graduate school based on survey of 320 URM STEM graduates of U of M campuses (86 respondents; 27% response rate)

University of Minnesota-Morris
Morris, Minnesota

University of Minnesota, Morris (UMM) is one of the top public liberal arts colleges in the nation. As one of five campuses of the University of Minnesota, UMM has a unique mission and offers the best of both worlds of higher education—a small, close-knit campus complemented by the power of a world-renowned research University system. UMM has an enrollment of about 1,900 students, more than 145 teaching faculty, and the highest percentage of underrepresented students (15%) among all University of Minnesota campuses. The "Morris experience" emphasizes faculty/student collaborative research, study abroad, and service learning. UMM is consistently ranked as one of the nation's top public liberal arts colleges by U.S. News & World Report and others.

LSAMP Program Impact—UM Morris:
UM Morris has established a strong cohort which meets with faculty mentors to learn about academic success, career development, and undergraduate research. UMM has integrated faculty in STEM fields with Multicultural Student Program office, Grants Management and Student Affairs, and is building a student ownership of North Star STEM Alliance program at Morris. UMM has implemented integrated peer tutoring in statistics courses.

Outreach: North Star Scholars participate in a service learning activity in spring semester.

Underrepresented minority STEM graduates, years 1-5, cumulative: 36
Level 1 (directly funded) Students, years 1-5: 69
Students engaged in undergraduate research through Phase 1, year 5: 18
Program support through Phase 1, year 4: $46,797
Proportion of total program support as wages to undergraduates: $26,239

Participant support through Phase 1, year 5: $92,580
Total support to undergraduates: $118,819
Program Indirects: $13,717
Total support to UMM: $132,536
Students attending graduate school: minimally 2, 1 in STEM graduate school based on survey of 320 URM STEM graduates of University of Minnesota campuses (86 respondents; 27% response rate)

V. Partner Institutions–Minnesota State Universities

Metropolitan State University

St. Paul, Minnesota

Metropolitan State University, a public four-year institution in the Minnesota State Colleges and Universities system, is committed to helping students who come from a range of backgrounds and to students who want to fit education into their lives. Metropolitan State has been nationally recognized for its teaching excellence. Its dynamic learning environment and distinguished faculty combine to ensure that students receive an education in touch with the real world. The College of Arts and Sciences, the largest in the university, is home to academic disciplines that address the core knowledge of a university education.

Diversity Goals: Metropolitan State is developing a new University Diversity Plan that calls on every member of the President's Cabinet to increase diversity and inclusion, equity, and cultural competence within his or her area of responsibility. Each cabinet member is also expected to pursue professional development that will increase his or her own cultural competence. They have identified the Developmental Model of Cultural Sensitivity (DMIS) as the tool for building a common understanding, common vocabulary, and common framework with which to promote their own development.

LSAMP Program Impact—Metropolitan State University:
Metropolitan State has engaged students in peer tutoring, and group study, and Alliance-wide events. President Sue Hammersmith had her entire 18-member cabinet most directly responsible for students' learning environment and experiences train in the DMIS and take the IDI assessment and interpretation. This development grew out of the Alliance Governing Board doing the IDI assessment in November 2010. This has provided University administrative leadership with a common understanding, vocabulary, and framework with which to promote their development. It also provided them with a fundamental intercultural competence to understand issues identified by students, employees, and the Anti-Racism

Our North Stars...

June Sayers

June completed a B.S. in environmental sciences from St. Cloud State University in 2011. She has performed research at the Outdoor Stream Lab of the National Center for Earth Surface Dynamics for several summers. The research experience greatly influenced her undergraduate career.

Leadership Team from a developmental framework rather than a critical, defensive mindset. The cabinet's investment in the IDI has prepared them for broader use of the IDI across the institution to develop the cultural competence called for in the University Diversity Plan.

Underrepresented minority STEM graduates, years 1-5, cumulative: 89
Level 1 (directly funded) students, years 1-5, cumulative: 32
Students engaged in undergraduate research through Phase 1, year 5: 4
Phase 1 Program support: $36,180
Phase 1 Participant support: $15,218

Minnesota State University, Mankato
Mankato, Minnesota

Minnesota State University, Mankato is a four-year public institution within the Minnesota State Colleges and Universities system. More than 14,500 students are enrolled at MSU-Mankato, including nearly 500 international students from 66 countries. MSU-Mankato has approximately 1,800 faculty and staff, including more than 630 full-time instructional faculty, 76% of whom have terminal degrees. More than 1,000 students of color attend MSU-Mankato, which has a diverse faculty and staff and an institutional commitment to welcoming underrepresented populations.

LSAMP Program Impact-MSU-Mankato:
Mankato's Scholar program has become very well established in the last three years. It is organized as small cohort groups based on major. Each group consists of four to five Scholars plus a Fellow who leads weekly study/tutoring sessions, organizes regular group events, and also meets individually with each scholar from the group for individual goal setting. Recent cohort events planned and led by fellows have included tours of various on-campus labs and other STEM related facilities, industry visits to local manufacturing plants, scholarship application workshops, and movie nights where groups view and discuss films related to their majors. This system provides the Fellows with an excellent opportunity to develop leadership and mentoring skills, and also allows the Scholars the opportunity to work closely with an upper level student in their discipline. The site coordinators have found that the students truly embrace this system. The Fellows have taken ownership of their groups and are dedicated to helping their scholars succeed. Several of our current Fellows report that they were motivated to apply for the position because they had such a great experience when they were Scholars working with their Fellows last year. The entire group gathers once a month for community building and networking.

Underrepresented minority STEM graduates, years 1-5, cumulative: 71
Level 1 (directly funded) students, years 1-5, cumulative: 81
Students engaged in undergraduate research through Phase 1 year 5: 18
Program support through Phase 1, year 5: $39,005
Participant support through Phase 1, year 5: $51,341

Saint Cloud State University
St. Cloud, Minnesota

St. Cloud State University is the largest member of the Minnesota State Colleges and Universities system and the second largest university in Minnesota. This academically diverse university offers more than 200 programs of study. Students from 82 nations attended St. Cloud State University this semester.

LSAMP Program Impact—St. Cloud State University:
St. Cloud State has strongly supported individual students in their undergraduate research. Site coordinator Bruce Jacobson, a biology faculty member, has also developed the Applied Structural Genomics model for engaging groups of underrepresented students in research as early as second semester of their freshman year. Applied Structural Genomics (ASG) is an undergraduate research process based on the gene-to-structure efforts ongoing in both academic and private research. Execution of the process requires the successful application of a series of fundamental molecular biology and biochemical techniques including bioinformatics, cloning, protein expression, purification,

characterization, and crystallization. Hence the gene-to-protein process represents an ideal introduction to applied biochemistry for students.

The model has several unique educational experiences embedded within it. It is inherently challenging, requiring a team-based approach to execute the tasks within the constraints of busy undergraduate schedules. Failure is built in (not all 15 genes would be expected to make it through the process successfully) and at the same time success is ensured by a parallel approach that includes enough candidates at the early stage to ensure some will complete the process. As the teams are composed of students with differing levels of experience (freshman to master's level), mentoring and peer-to-peer support are included by design.

Outreach:

1. Applied Structural Genomics model introduced to 14 Ridgewater Community College students.
2. Scientific Discovery Program and Advanced Program in Technology and Science
3. STEM Summit brings students in grades 7-12 to meet Minnesota's business and higher education communities.
4. Science Express is a mobile science lab that brings hands-on high tech activities to area elementary, middle, and high school schools.

Underrepresented minority STEM graduates, years 1-5, cumulative: 82
Level 1 (directly funded) students, years 1-4, cumulative: 40
Students engaged in undergraduate research through Phase 1, year 5: 17
Program support through Phase 1, year 4: 35,431
Participant support through Phase 1, year 4: $31,920

VI. Partner Institutions –Private Colleges

Augsburg College

Minneapolis, Minnesota

Augsburg College, founded in 1869, is a private college in Minneapolis affiliated with the Evangelical Lutheran Church in America. On its urban campus, the Augsburg community includes approximately 3,100 students from 36 states, 47 foreign countries, and 24 tribal nations and reservations, and students may choose from over 50 major areas of study. The primary focus is the undergraduate program offered in the more traditional day program and a large Weekend College Program for working adults.

LSAMP Program Impact—Augsburg College:
Augsburg has taken a leadership role in establishing supplemental instruction for calculus aimed at underrepresented minority STEM majors. Site coordinator and mathematics faculty member Rebekah Dupont, Ph.D., teaches this half-credit course which brings students together weekly to work out calculus problems. A junior or senior North Star Fellow assists Dr. Dupont, giving the students access to both student and faculty role models. During the sessions, they also discuss preparation for research and Alliance-wide opportunities.

Physics professor Ben Stottrup has been influential in encouraging students into research. He meets with them for a number of weeks to learn about lab equipment and the research process before they actually begin working in his lab for the summer.

Augsburg's Director of Enrollment, Planning and Systems Development is preparing a retrospective STEM report examining enrollment, retention, and graduation data over the years and will include data on STEM students in Augsburg's annual data factbook beginning in January 2012. This report is in direct response to a request from Augsburg's LSAMP Program Advisory Committee. Augsburg has had the executive and admissions staff critically examine their cultural competency using the Intercultural Developmental Inventory (IDI) as a tool over the last three years. The LSAMP Program will support a group of Augsburg faculty in taking the IDI in fall 2011.

Underrepresented minority STEM graduates, years 1-5, cumulative: 29
Level 1 (directly funded) students, years 1-4, cumulative: 113
Students engaged in undergraduate research through Phase 1, year 4: 27
Program support through Phase 1, year 4: $45,235
Participant support through Phase 1, year 4: $99,690
Students advancing to graduate school: 6

Carleton College
Northfield, Minnesota

Carleton College is a nationally ranked undergraduate college enrolling approximately 1,900 students. The college ranks first overall among liberal arts colleges for Ph.D. graduates in the sciences and mathematics, including first in physics and astronomy, fourth in biology, first in chemistry, and first in geology. From 1999 through 2003, Carleton ranked second among all primarily undergraduate colleges in the number of its students awarded prestigious NSF Fellowships for graduate study in the

mathematical and physical sciences. In recent years, about 75 percent of all Carleton students pursue an advanced degree, most within five years of graduation.

LSAMP Program Impact—Carleton College:
The FOCUS Cohort (Focusing on Cultivating Scientists) was designed by representatives from the sciences, math, the dean of the college, and the Division of Student Life. Each cohort is an academic year program enrolling up to 16 students in a first-year seminar and colloquium, where fundamental skills (quantitative, modeling, problem-solving) and team-building can begin to develop around compelling themes. FOCUS students then move on into appropriate introductory science and math courses during the winter and spring terms of their first year. Cohort programming through a year-long credit-carrying colloquium led by Deborah Gross, chemistry, in the first year features: effective use of academic support; navigating a diverse campus; conversations with scientists and alumni of color; conversations regarding science careers; information regarding early research opportunities at Carleton and elsewhere; and investigation of one topic each term, such as exponential growth, the science of smell, science writing, etc. FOCUS activities also include advising, community building, tutoring, and career exploration.

Underrepresented minority STEM graduates, years 1-5, cumulative: 44
Level 1 (directly funded) students, years 1-5, cumulative: 81
Students engaged in undergraduate research through Phase 1, year 5: 12
Program support through Phase 1, year 5: $20,053
Participant support through Phase 1, year 5: $30,608
Students advancing to graduate school: approximately 4

Gustavus Adolphus College
St. Peter, Minnesota

Founded in 1862, Gustavus Adolphus College is a church-related, residential, co-educational liberal arts college primarily serving traditional-age students. The college has a highly talented student population of approximately 2,500 and a strong faculty committed to teaching and liberal learning.

The two-day Annual Nobel Conference, which since 1965 has been the only ongoing educational forum in the United States authorized by the Nobel Foundation, reflects the college's special relationship with the Nobel Foundation. Each year, some 5,000-6,000 high school and college students, educated laypersons, and scientists participate in this special event, which features the world's leading authorities on cutting-edge science issues.

LSAMP Program Impact—Gustavus Adolphus College:
Through the North Star Scholars and Fellows program, Gustavus Adolphus has provided academic and socialization support and fostered a sense of community among underrepresented minority students pursuing a degree in STEM. In doing so, retention for underrepresented minority students in STEM at Gustavus has been improved, resulting in 10 currently declared STEM majors, who have an average overall GPA of 3.1. In response to the NSF-LSAMP Program North Star Alliance Initiative, Gustavus Adolphus has put forth additional institutional resources to support Hmong students. These students are also underrepresented in STEM in Minnesota, but this cultural community is not yet recognized as underrepresented by NSF. The college provides stipends and invites them to socialization and STEM networking events.

Many Gustavus Level 1 students have risen to the challenge of becoming leaders in STEM on campus – not just leaders within the target student population, but leaders who are well-respected on campus by students across the board. Faculty mentors have observed tremendous growth in self-esteem and self-reflection in students who worked in summer research projects or who were mentors for younger students. Similarly, the faculty are engaged in discussions about inclusivity in the classroom; are more sensitive to the needs of all students; and are particularly attuned to the cultural differences among our students. In short, Gustavus faculty are growing as teachers as a result of the conversations surrounding the LSAMP Program grant.

Gustavus Adolphus invites Alliance students to attend the Nobel Conference annually. Approximately 100 students in Phase 1 have attended this excellent forum on science and society.

Underrepresented minority STEM graduates, years 1-5, cumulative: 13
Level 1 (directly funded) students, years 1-5, cumulative: 48
Students engaged in undergraduate research through Phase 1, year 5: 11
Program support through Phase 1, year 5: $32,400
Participant support through Phase 1, year 5: $45,225

Macalester College
St. Paul, Minnesota

Macalester is a highly selective private liberal arts college committed to academic excellence, internationalism, multiculturalism, and service. An 11:1 student/faculty ratio insures that Macalester's 1,950 students receive intensive instruction both in and out of the classroom. U.S. students of color comprise 18% of the U.S. student body, more than twice the average enrollment of

students of color at Minnesota colleges and universities. Across its science disciplines, Macalester has undertaken initiatives to attract and retain underrepresented students to STEM disciplines. One such effort is the Diversity in Science Collective (DISC), a year-round initiative supported through the Office of Research and Experiential Learning in the Science Division. The first-year students within the Diversity in Science Collective meet weekly to learn more about STEM careers, the research programs of Macalester science faculty, and about professional associations and conferences. DISC also encourages entering students to draw upon the experience and insights of advanced students.

LSAMP Program Impact—Macalester College:
With LSAMP Program support, Macalester has strongly supported individual students in their undergraduate research. Students have also traveled to national STEM meetings in order to present their research and network with STEM professionals.

Underrepresented minority STEM graduates, years 1-5, cumulative: 31
Level 1 (directly funded) students, years 1-5, cumulative: 35
Students engaged in undergraduate research through Phase 1, year 5: 16
Program support through Phase 1, year 5: $23,131
Participant support through Phase 1, year 5: $43,730

Saint Olaf College
Northfield, Minnesota

Founded in 1874 by Norwegian Lutheran immigrants, St. Olaf is a nationally ranked liberal arts college of the Evangelical Lutheran Church in America. Its 3,000 students are drawn to St. Olaf from 43 states and 19 foreign countries. St. Olaf is recognized for its innovative approaches to undergraduate science education, long-standing engagement in global education, and commitment to environmental sustainability. St. Olaf offers 43 graduation majors, including 15 teaching certifications, 18 concentrations, and 17 pre-professional fields. Although only one major is required for graduation, many students choose multiple majors, of which the most popular are English, biology, mathematics, economics, and psychology.

LSAMP Program Impact—St. Olaf College:
St. Olaf has concentrated its LSAMP funding toward its Summer Bridge Program. Once students matriculate, they participate in TRiO programs and NSF-funded S-STEM

scholarship programs. Summer Bridge has given URM STEM students a successful launch into their undergraduate career.

Underrepresented minority STEM graduates, years 1-5, cumulative: 20
Level 1 (directly funded) students, years 1-5, cumulative: 78
Students participating in Summer Bridge: 65
Program support through Phase 1, year 5: $3,880
Participant support through Phase 1, year 5: $69,773

VII. Partner Institutions – Community Colleges

Anoka-Ramsey Community College

Coon Rapids, Minnesota

Anoka Ramsey Community College (ARCC) is a two -year college in the Minnesota State Colleges and Universities system in the north suburban Twin Cities. Each year ARCC serves more than 10,000 learners of all ages as they pursue associate degrees that transfer as the first two years of a bachelor's degree or certificate programs that lead immediately to rewarding careers.

STEM Goals: The North Star STEM Alliance is one of several strategies that Anoka Ramsey has applied to improve underrepresented students' academic performance in STEM. ARCC has applied state funding through the Access and Opportunity Grant to support students in developmental math. The support has resulted in the establishment of a separate tutoring center for developmental math students. There have already been over 5,000 visits to this center in the 2009-2010 academic year. Currently, a portion of the funding is also going towards providing math tutoring and supplemental instruction to high school students transitioning to college.

ARCC has also received $1,038,000 from the U.S. Department of Education over three years from the fund for the Improvement of Post-Secondary Education to develop certificates, associate, and bachelor programs that prepare students for engineering roles. The focus is on enhancing educational pathways from secondary schools to college credentials. ARCC has established an A.S. in Applied Engineering degree, articulated with a B.S. in Applied Engineering at Bemidji State. Curriculum development and mapping, along with support services reaching down into the high schools to prepare underrepresented students for careers in STEM fields, is the focus of the work for 2010-2012.

Diversity Goals: On November 10, 2010, Interim President Jessica Stumpf signed ARCC's first-ever four-year Diversity Plan 2010-2014 . The plan was developed to achieve greater

alignment with ARCC's strategic plan, a plan which demands reported measurement of persistence and completion rates for underrepresented students. It outlines an ambitious agenda meant to change how ARCC approaches diversity both internally and externally and emphasizes that educating employees is crucial to ARCC's mission. Specifically, the mission of ARCC's Diversity Committee and the goal related to diversity reads: "To ensure commitment of inclusivity at all levels of the institution through implementation of the principles of cultural competence, domestic and global awareness. We are dedicated to examining and implementing best practices in regards to recruitment, retention, and success of employees and learners from populations traditionally underserved by ARCC." This is associated with the system (Minnesota State Colleges and Universities) goal: "Employ outstanding faculty and staff who bring current knowledge, professional skills and cultural competence to educate students."

LSAMP Program Impact—Anoka Ramsey Community College:
ARCC has engaged students by having them attend the National Society of Black Engineers regional conferences. Like many students, they found this to be a transformative experience. They readily formed a cohort group back on campus, and their conversations were no longer limited to thoughts of finishing an associate's degree, but instead broadened to transferring and completing a bachelor's degree. ARCC students will participate in the Applied Structural Genomics research program initiated at St. Cloud State University in 2011-2012 .

ARCC also organized four biology faculty, two chemistry faculty, and two math faculty plus Vice President Michael Seymour, dean of STEM and site coordinator, and Diversity Director Marcellus Davis to participate in the DMIS/IDI training and assessment. This initial training is seen as an important step in moving faculty and staff toward a more culturally competent model. The faculty who have volunteered to take part in the IDI will provide leadership to the college and bring expertise to other faculty and staff. Faculty involvement, along with administrative support, is viewed as key to promoting these goals.

Level 1 (directly funded) students, years 1-5, cumulative: 17
Program support through Phase 1, year 5: 29,480
Participant support through Phase 1, year 5: $28,601

Century College
White Bear Lake, Minnesota

Century College is the largest two-year combined community and technical college in Minnesota. Century serves over 12,000 students per year and offers more than 60 technical and occupational programs, a wide variety of customized training and continuing education, and liberal arts and science degrees designed for transfer to four-year institutions. Century is also home to one of the first installations of the MIT-based Fab Lab in the nation.

LSAMP Program Impact—Century College:
More than 50 underrepresented students at Century College have participated in the North Star STEM Scholars program over the past four years. Through biweekly meetings with all STEM Scholars throughout the year, students learn about careers, research, or diversity issues in STEM fields and engage in activities that improve their study and life skills. STEM Scholars also attend 13 hours of other STEM activities each semester, which includes attending meetings of professional organizations, visiting the Science Museum of Minnesota, attending a math and science fair or STEM summit, or participating in science outreach activities in the community.

STEM Scholars have shared with faculty mentors that by participating in this program, they have gained a better understanding of research and career opportunities in STEM fields and have intensified their desire to get a STEM degree. Faculty mentors meet with each scholar individually two to four times a semester to monitor the scholar's progress at Century and in the STEM Scholars program. Faculty mentors have also helped scholars set goals, design life plans, improve resumes, and transfer to four-year schools. Scholars value the close connection they develop with their faculty mentor.

The benefit to Century's underrepresented STEM students through their participation in the Scholars Program is obvious when discussing the program with past participants. The word has spread, and faculty continue to see increased applications to the program every semester. Century has benefited, too, as more students participate in professional activities outside of Century, take on leadership roles in the school, and become exemplary role models for their peers.

Level 1 (directly funded) students, years 1-5, cumulative: 83
Students engaged in undergraduate research through Phase 1, year 4: 2
Program support through Phase 1, year 5: $30,827
Participant support through Phase 1, year 5: $55,095

Fond du Lac Tribal and Community College
Cloquet, Minnesota

Fond du Lac Tribal and Community College (FDLTCC) is a unique institution, created by the Minnesota Legislature and chartered as a tribal college by the Fond du Lac Reservation in 1987. The mission of Fond du Lac Tribal and Community College is to provide higher education opportunities for its communities in a welcoming, culturally diverse environment. Fond du Lac Tribal and Community College offers several advantages to students. The student-to-instructor ratio is about 18 to 1. Classes are offered during day, evening, and weekend hours, making it easy to fit classes into a busy schedule. While enrollment is at an all-time high of more than 2,000 students, the college is still able to maintain its friendly, comfortable atmosphere.

LSAMP Program Impact—Fond du Lac Tribal and Community College:
LSAMP support has allowed Native American students to participate in microbiology and ecology research at FDLTCC and to attend the American Indian Science and Engineering Society national and regional meetings, the American Indian Higher Education Conference (AIHEC), and giiwed'anang (North Star) AISES Alliance retreats.

Level 1 (directly funded) students, years 1-3, cumulative: 15
Students engaged in undergraduate research through Phase 1, year 3: 7
Program support through Phase 1, year 3: $9,208
Participant support through Phase 1, year 3: $13,354

Minneapolis Community and Technical College
Minneapolis, Minnesota

Minneapolis Community and Technical College (MCTC) is a two-year college in the Minnesota State Colleges and Universities system serving about 12,000 students. MCTC's outstanding liberal arts and science disciplines provide students with a solid foundation in a liberal arts education for transfer into four-year degree programs. Students can take liberal arts coursework in more than 35 different areas of study, including

the new Associate of Fine Arts degree; new Associate in Science degrees in biotechnology, biology, math, and chemistry; and six different languages. Experienced faculty who hold Ph.D.'s, Master's or Master of Fine Arts degrees offer instruction in small classroom settings. Classmates from all over the world provide rich, global perspectives on the subject matter.

LSAMP Program Impact—Minneapolis Community and Technical College:
MCTC engages North Star STEM Scholars in informal cohort settings, Alliance-wide activities, and national meetings such as the Experimental Biology Conference. The Scholar program at MCTC encourages students to attend two STEM-related events throughout the semester and participate in a academic success series (supplemental instruction, study group, or open office hours). Open office hours for all MCTC students provides low-stakes opportunities for social networking, peer tutoring and faculty mentoring. STEM-related activities taking place at MCTC include: North Star STEM Alliance Scholar meetings that focus on developing academic skills; guest speakers who represent STEM career options; and field trips to local laboratories including the University of Minnesota and Twin Cities biotechnology companies. Participation in these activities allows students an opportunity to meet other students with similar goals, explore career options, and receive mentoring in both academic and career planning skills. In addition, MCTC offers an Introduction to Research program that allows students to practice research lab skills in preparation for undergraduate research opportunities.

The Racial Equity Committee of MCTC is an ad-hoc committee formed within the Minnesota State College Faculty union at MCTC. They are a group of 11 faculty members working for racial equity within the faculty at the college by directly affecting hiring practices and providing support for retention of faculty of color. They also promote campus awareness about the importance of diversifying the faculty as it relates to the strategic goal of increasing student success measured as graduation rates. The goal of MCTC's committee in this IDI is to begin the conversation about how to communicate this intercultural development spectrum with other faculty at MCTC, and to determine whether to offer it to a larger population of faculty on campus.

Level 1 (directly funded) students, years 1-5, cumulative: 24
Students engaged in preparation for undergraduate research, Phase 1, year 5: 14
Students engaged in undergraduate research, year 5: 5
Program support through Phase 1, year 5: $18,005
Participant support through Phase 1, year 5: $26,925

North Hennepin Community College
Brooklyn Park, Minnesota

North Hennepin Community College (NHCC) is a two-year college in the Minnesota State Colleges and Universities system serving 9,230 students. One of the largest community colleges in the state, it serves more than 9,230 students with credit offerings and an additional 6,600 people from 260+ organizations with continuing education and customized training. NHCC offers small classes taught by highly educated faculty who bring experience and a passion for teaching to the classroom.

LSAMP Program Impact—North Hennepin Community College:
The LSAMP program has supported six underrepresented students in applied genetics research.

Phase 1, Level 1 (directly funded) students: 11
Students engaged in undergraduate research, Phase 1, year 5: 7
Program support through Phase 1, year 4: $6,218
Participant support through Phase 1, year 4: $5,545

VIII. Partner Institutions – Community Organizations

Science Museum of Minnesota
St. Paul, Minnesota

The Science Museum of Minnesota (SMM) is a private, nonprofit organization dedicated to research and public science education. North Star STEM Alliance Fellows mentor high school students involved in SMM's Youth Science Center. They also present at Science Fusion multicultural programs—African Americans in Science Day, American Indians in Science Day, and Amantes de la Ciencia. Each spring the forum events introduce approximately 3,000 youth and families to underrepresented STEM leaders in academia and industry. Cohort groups arrange outings to the exhibits and Omnitheater several times per year. The Science Museum also hosted the 2008, 2009, and 2010 Fall Kick-Off.

Minnesota High Tech Association
Roseville, Minnesota

Minnesota High Tech Association is a professional and trade association of several hundred Minnesota high-technology companies dedicated to making Minnesota the best state in the nation for technology-based industry. The MHTA, a community partner in the Alliance, promotes summer internships in industry and invites students to its major networking activities, the Tekne Awards in the fall, and the spring Conference. This one-day conference gathers corporate leaders for keynote presentations and discussions on staying abreast of changing technologies in a rapidly changing economic environment. Students have informal conversations with corporate representatives in the breakout sessions and exhibit hall. Approximately 40 Alliance students have attended the Spring Conference in Phase 1. Minnesota High Tech Association hosted the very popular annual Tekne Awards on October 30th, attended annually by 1,100 Minnesota corporate leaders. Companies and educational organizations promoting STEM receive awards for leadership and innovation in Minnesota high-tech business and industry. In Phase 1, approximately 75 Alliance students attended the Tekne Awards.

MHTA™
MINNESOTA HIGH TECH ASSOCIATION

Our North Stars...

Jessica Santiago

Jessica completed her Bachelors of Science in Physics from the UMN-Twin Cities in 2011. She began her research career the U of M Multicultural Student Research Opportunity Program. She became active in the North Star STEM Alliance through numerous outreach activities and many hours as a peer tutor in the Multicultural Center for Academic Excellence. Jessica is now enrolled in a Ph.D. physics program at Rice University.

Our North Stars...

Arif Hamid

Arif completed his Bachelor of Science degree in Neuroscience from the UMN-Twin Cities in 2010. He attended the American Chemical Society regional meeting in Iowa City, IA from October 21-24, 2009. Arif participated in two poster presentations entitled "In Vitro Studies of the Effect of Metal Ions on Urease Activity," and "The Activity of Alkaline Phosphatase in Presence of Metal Ions." At this conference, Arif received the American Chemical Society, Midwest regional Conference Outstanding Undergraduate Poster Award for his presentations, 1 of 10 chosen among 6,000 posters. He also attended the National Conference on Undergraduate Research in Missoula, MT from April 15-18, 2010. Arif participated in two oral presentations entitled: "Molecular Mechanism of Alkaline Phosphatase Inhibition by Metal Ions: A Comparative Examination" and "Urease Inhibitors: Why not a Cheaper, Environmentally Friendly Choice." Following a summer of research at Woods Hole Oceanographic Institution, he gave a brief keynote at the 2010 Kick-Off.

www.northstarstem.org

About the North Star STEM Alliance

The North Star STEM Alliance is an 18-member alliance among Minnesota colleges, universities, and community organizations committed to supporting multicultural students toward earning bachelor's degrees in STEM—science, technology, engineering, and mathematics. The Alliance is supported by the National Science Foundation grant #0703356, with additional support from partner institutions.

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