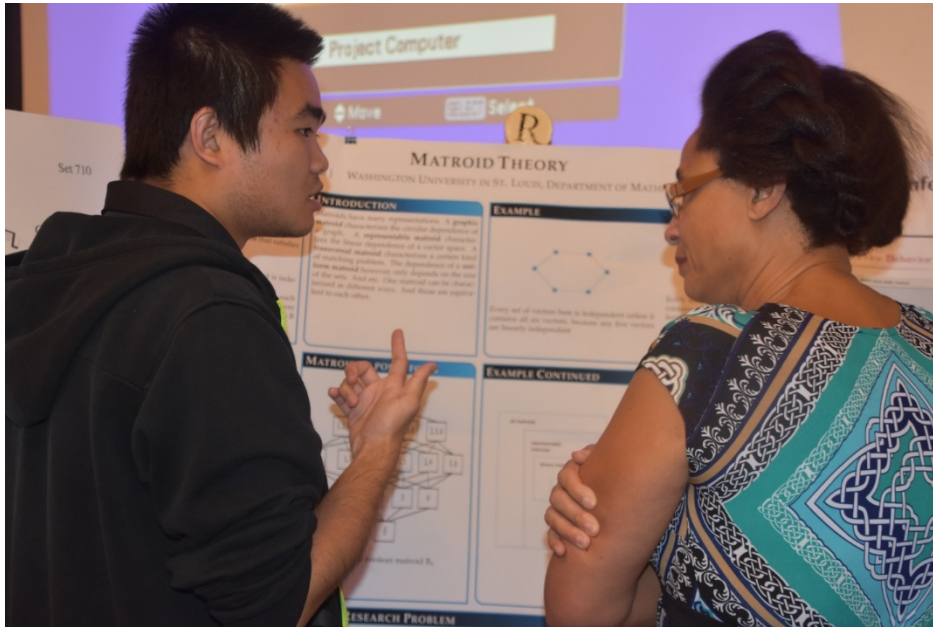


## National Alliance for Doctoral Studies in the Mathematical Sciences (the Math Alliance)



Photos are courtesy of Donald Cole

In the 1990s the mathematics department at the University of Iowa embarked on an effort to recruit and retain graduate students from members of groups underrepresented in mathematics. Through careful attention to mentoring and by observing what helped the students succeed, the department underwent a transformation that refocused its commitment to serving all students well. Seeking to expand these efforts, it formed a partnership with the math departments on the other two Iowa State Regents campuses—Iowa State University and the University of Northern Iowa—and with several historically black colleges and universities. The success of this work was recognized by the AMS Award for an Exemplary Program or Achievement in a Mathematics Department, which went to the University of Iowa in 2008 and to Iowa State University in 2015.

It is from these roots that the Math Alliance has grown. That it started in Iowa, where the population is predominantly white, and in math departments with predominantly white faculty has provided an example and an inspiration that many other departments have begun to follow.

The main purpose of the Math Alliance is to ensure that students from underrepresented groups who have the ambition and desire to pursue graduate study in the mathematical sciences have an opportunity to do so in a supportive environment. The Alliance helps students realize their potential for graduate work in these fields and nurtures them in their journey to becoming math science professionals. More broadly, the goal of the Alliance is to spark a spiritual transformation within mathematical sciences departments so that they set aside the

traditional model of weeding students out and embrace an inclusive model of helping all students succeed.

While originally focused on minority groups, today the Math Alliance aims to serve a wider collection of “underrepresented” students: those who are U.S. citizens or permanent residents and who come from ethnic groups, families, and/or regions that have had little prior experience with doctoral study in the mathematical sciences. This shift reflects a deeply held value of the Math Alliance community and an understanding that many citizens come from backgrounds that have historically lacked opportunities to pursue STEM careers. For example, the Math Alliance has worked closely with the math department at Eastern Tennessee State University, which sent approximately twenty of their students to the most recent Field of Dreams conference. While most of these students are not from minority backgrounds, they come from a region of the country that is underrepresented in the math sciences. As a result of this broadening of focus, about 85 percent of the students served by the Alliance are from minority backgrounds, and it is expected that this number will vary as the profession evolves.

The Math Alliance has a nationwide network of mentors, organized regionally, who are at institutions with a substantial proportion of undergraduates from underrepresented groups. These mentors nominate undergraduate math sciences majors and master’s students to become Alliance Scholars, who then become eligible for various Alliance programs. In addition to advising and supporting the students, the mentors share ideas with other likeminded faculty to help spread the Math Alliance spirit.

Each Alliance Scholar is paired with at least one mentor and has the opportunity to participate in Alliance summer research experiences for undergraduates programs. Alliance Scholars attend the annual Field of Dreams conference, which has been held each fall since 2007. Drawing about two hundred students and about one hundred faculty members, Field of Dreams has become a magnet for minority students interested in mathematics or statistics as well as a recruiting event for Alliance institutions. Other quantitative fields, such as engineering and business, are also represented. At the conference, students build friendships, get to know mentors, find out how to prepare for and apply to graduate school, and learn about career opportunities. In addition to helping students, Field of Dreams strengthens ties among Math Alliance mentors.

The Alliance has worked with faculty in graduate programs across the nation to build Alliance Graduate Program Groups. These are groups of faculty in departments that have made a commitment to the Alliance spirit of helping all students succeed and of providing a friendly, welcoming community within the department. Today there are thirty-five Graduate Program Groups, and several other departments have applied to join.



Photos are courtesy of Donald Cole.

One of the most successful programs of the Math Alliance is called Facilitated Graduate Applications Process (F-GAP). Its purpose is to provide undergraduate seniors and master's students with the advice and assistance needed to successfully apply to graduate programs. Each student is paired with a faculty member at a Graduate Program Group who serves as the Alliance Doctoral Mentor. The student, the doctoral mentor, and the predoctoral mentor form the graduate mentoring team, which helps the student decide which doctoral programs to apply to and assists the student with all aspects of the application process. F-GAP has placed more than two hundred students in math sciences graduate programs over the last three years.

In 2016 the Math Alliance moved to its present home at Purdue University. One of the founders of the Math Alliance, Philip Kutzko, of the University of Iowa, is the director, and David Goldberg, of Purdue University, is the executive director. Edray Goins, who also serves as the president of the National Association of Mathematicians, is the associate director of the Math Alliance. The work of the Math Alliance has received support from the National Science Foundation since 2002. One of the present goals is to institutionalize the Math Alliance to make it a self-supporting organization, and the move to Purdue, which has generously provided bridging support, may be seen as a move in this direction.

~ Allyn Jackson, senior writer and deputy editor of the Notices.