

College of Science and Mathematics Ambassadors

Year in Review



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Dean's Foreword

Kimberly Wallin, Ph.D.

College of Science and Mathematics Ambassadors are our current and future leaders. They entered NDSU with hopes and dreams of how to use their college education to better themselves, society, and world. They experience tremendous changes within themselves as they navigate college, a global pandemic, friendships, and being leaders. My hope for them and all of us is that we've learned, perhaps even embraced, that uncertainty is a foundation from which we grow, thrive, and discover. It doesn't matter if you like or embrace change, change is as inevitable as snowy winters in North Dakota. Some of us joyfully play in the snow, some of us stay indoors and enjoy the peaceful blanket of snow, while others resent the piles of snow. No matter what, it snows in North Dakota and we can't control the weather. I am grateful for our Ambassadors as they helped lead us through the many changes and confident they will stay connected with others, be committed to purposes beyond themselves, and be emotionally compassionate and courageous.

All my best,

Kimberly F. Wallin, Ph.D.

Dean, College of Science and Mathematics

North Dakota State University



The 2022-23 Ambassadors with the newest Ambassadors for the 2023-24 academic year.

Assistant Dean's Foreword

Nadeje Alexandre, Ph.D.

As I was preparing my welcome to the Student Ambassadors of the newly merged college, I was confronted with an overriding theme of conversations that I have been having with colleagues and fellow educators in higher education over the last few months. We all agree that what is unique about higher ed and student engagement is the pace of change and how purpose and the idea of service is an influencer. Purpose, which contributes to something greater than you is what comes to mind when I think about College of Science and Mathematics Ambassadors and watch them in action.



As faculty advisor to the Student Ambassadors, our year as a college was one of building ever stronger student support and engagement programs and one where student wellness and wellbeing is at the core of change for healthy transitions. With the leadership and direction of the ambassador presidents and executive committee, they increased awareness and built community through a variety of programs and events such as New Student Welcome and Celebration of Student Athletes, Study Hall Café, and Peer Mentor Program, while supporting existing programs such as the Learning Assistant program, Admissions and Recruiting, just to name a few. In the College of Science and Mathematics, we are in deep appreciation and gratitude for all that the ambassadors have contributed in making our college a healthy and purposeful space where students thrive and feel a sense of belonging and community. I have no doubt that they instill these very principles in their peers who will continue to engage in their professions and society with these same values. Thank you for all that you do.

Nadeje Alexandre, Ph.D.
Assistant Dean of Student Success
North Dakota State University

Study Abroad

Mandi Hansmeyer



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The conversations unexpectedly helped me learn about the political and social environment of the country.

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Entering my first year at NDSU, I had no intention of studying abroad and did not believe there were any options to do so with my major in Biological Sciences. It was not until my junior year, when I decided to add a second major in Psychology, that I really began to explore my options. I felt like I was running out of time to travel before I graduated and entered the “real world”. Unbeknownst to me, there were options for me to study abroad and continue my classes in biological sciences and psychology. Unfortunately, being in my Junior year, with only three semesters remaining, and wanting to continue with my on campus research and organizational involvement, Summer was the best time for me to go, which reduced my options. This slight setback however, ended in me finding an amazing summer program in my dream location, Greece! I was able to take an upper division class in Psychology there, while simultaneously taking an online course through NDSU.

The experience of studying abroad, although one of the most exciting times in my life, challenged me in ways I was not expecting. My class there was very different from the classroom environments I was used to at NDSU. Students actively participated in the conversations and refuted statements from the professors that they disagreed with, which was met with classroom debates on the topic. The conversations unexpectedly helped me learn about the political and social environment of the country. Although these conversations were fascinating, it was difficult to adapt to this kind of learning and keep track of the content I needed to know. Looking back, that learning environment prepared me for learning outside of the classroom, and the importance of understanding topics in the individualized social climates of the world. It was an invaluable experience that I will carry with me throughout my life.



LEARNING ASSISTANTS



Hannah Khan

NDSU offers many student support programs to allow for students to succeed during their time in college. One such program is the Learning Assistant (LA) Program. LA's are students who have successfully completed the course and are willing to provide assistance to the instructor as well as to the students. They are in the classroom while the course is being taught to answer questions and facilitate discussion. They also hold office hours in order to answer additional questions students may have.

I was an LA for Biology 150 and Biology 151. I thoroughly enjoyed this experience as it helped me watch students succeed. I was able to provide encouragement and advice for the students I was an LA for. Not only was I able to help those students succeed in the course they were in, it helped me succeed in my higher level biology courses. As I was teaching others basic, yet essential biology, it strengthened my confidence in my own understanding of biology. This student support program runs both ways, investing in individuals who invest in it.

Peer Mentor Program

Harry Peterson

College can be very confusing and challenging for many students in any academic year. This confusion can sadly result in students not pursuing their degree and missing out on their dream career. Guiding those students through those challenges as a peer mentor has been a really rewarding experience for me. One instance that really stood out was when a transfer student reached out to me for help navigating their biology major. They found out about the peer mentor program through the many posters found throughout the campus and chose to reach out to me as our career goals were very similar. When we started the session, it started out as a pretty standard conversation about how their semester was going. The conversation quickly transitioned into the topic of an uncertain future. Through the simple action of being an open ear for the student, they opened up and started to tell me about their personal struggles and why they felt as though their future in the field of biology was uncertain.

After the true core of the problem was revealed, I told them about my personal journey of trying to obtain my biology degree and let them know that they were not alone. Then I walked them through our many student resources on campus, and got them in touch with some faculty to set up a meeting with the student to both assist them in their courses and make those important early connections in their college career. I'm so happy to be a peer mentor and have the opportunity to help students like them through those tough challenges!



RESEARCH

Emily Jackson



NDSU offers undergraduate students the ability to pursue undergraduate research. Many professors allow students to participate in research projects in their laboratories under the guidance of graduate students, thus allowing students the ability to use their knowledge from the classroom and apply it to the work they do in the lab as well as the ability to learn new skills. One student, Emily Jackson, a Geosciences major, recounts her undergraduate research experience.

“Several professors in the geosciences program offer independent and group research courses, which usually involve travel to places as near as Grand Forks and as far as the Bahamas. Getting to travel to new places and practice important job-based skills in the field provided me with an invaluable experience. Since I transferred to NDSU I've worked in the paleontology and sedimentology lab both to help run experiments for my professors, but also to perform my own research. Everyone in my major is encouraged to pursue personal research projects. Thanks to my lab work I have had the great privilege of having access to many high-technology tools, chemicals, and machines that help me conduct research and continue my learning beyond the classroom.”

ALUMNI ACHIEVEMENT FEATURE: PETER IWEN

Interview by Harry Peterson

Peter Iwen graduated from NDSU in 1976. He received the Alumni Achievement Award as he has attained outstanding professional accomplishments. He is currently the senior biosafety officer for the University of Nebraska Medical Center, a professor of microbiology in the College of Medicine, and director of the Nebraska Public Health Laboratory.

Do you believe that your parents' careers in medicine influenced your research interests?

Yes, I believe the occupations of my dad as a druggist and my mom as a nurse in Arthur as well as the occupation of my grandfather (who prior to becoming a druggist in Arthur had taught high school biology in Minneapolis) and the way they met the needs of the community led me to pursue a career in science.

When you were pursuing a degree in sciences at NDSU, how did you decide on bacteriology?

I would consider this a serendipitous event! I had plans to pursue my education as a horticulturist, but plans changed fall semester of my sophomore year. I enrolled in a required course in plant pathology which after a few days of lectures, changed my mind quickly that this was not an area of science that interested me. I replaced this class with a basic microbiology course taught by Dr. Mary Bromel. This created a spark and subsequently the next quarter registered in a bacteriology class taught by Dr. Berdell Funke. From this point on in my education, I was hooked in the microbiological science program.

After your academic career here at NDSU, what set you on the path for Nebraska for graduate school?

I had no intentions after graduation to pursue a graduate degree program and was interested most in landing a career potentially as a quality control scientist for a food manufacturing plant. I had at that time no experience in clinical microbiology and quite frankly had little knowledge of what to expect in the clinical sciences. My NDSU undergraduate advisor, Dr. Ken McMahon connected me with a colleague at the University of Nebraska Medical Center (UNMC) for a research scientist position to study in a mouse model a new imidazole antifungal compound (ketoconazole) as a treatment for cryptococcal meningitis, an invasive yeast infection. My research advisor at UNMC inspired me to pursue thesis MS graduate work while working full-time, a benefit offered to UNMC employees. In later years, a new chair of the department of pathology and microbiology also encouraged me to pursue additional educational training in a PhD program which further opened the doors for an academic position at UNMC.

How is being an educator enriched your career?

As a teacher, I appreciate the student interactions, the intellectual challenges, and the long-term relationships that I have acquired over the years. Teaching has instilled in me a desire to be a life-long learner and to stay current in an everchanging world of molecular diagnostics as pertaining to clinical microbiology. This desire to learn has allowed me to be on the cutting edge of laboratory science to address emerging and reemerging disease threats.

What does receiving this award mean to you and your research efforts?

Receiving this honor is a humbling experience and recognizing what has been accomplished in my job over the years is in reality a collaborative effort of many individuals. Science and public health are two passions of mine and seizing the opportunities that have been presented to me has led to a fulfilling career. Receiving this award shows that my efforts have had a positive impact in a challenging field, and I am grateful to the NDSU Foundation for consideration of me to receive this award on behalf of all those who have contributed to my success.

Department Updates



Biology ~ Avery Sylte

The biology department has had many exciting activities this past year for others to learn about biology. The Biological Sciences and Geosciences Department hosted Darwin days. This event included a Hall of Biodiversity Pop Up Museum with educational exhibits highlighting biological diversity and adaptation. The keynote speaker for Darwin Days was Dr. Katie Hinde from Arizona State University who gave a talk entitled “Mother's Milk: Debunking Myths, Exploring Evolution, and Updating Medicine.”

Many faculty members were awarded NSF grants/awards this past year. Dr. Angie Hodgson, was awarded an NSF grant to provide scholarships for Biological Sciences majors. This program is called the Herd Scholars Program, and will provide financial and mentoring support for undergraduates who plan

to go into research-related careers after graduation. Dr. Tim Grieves got an NSF training award to start a post baccalaureate research program centered around climate change. The department was also awarded an NSDU Foundation Impact grant to remodel Stevens Hall room 135 into a Collaborative Learning Center. It will be used by LAs in the Biology Department, the Herd Scholars, as well as other student organizations.

Chemistry & Biochemistry ~ Delaney Sage

The Chemistry and Biochemistry department at NDSU is hard at work contributing to the research advancements happening at our university. Not only are the faculty working on many different research projects, but over the summer, the department hosted undergraduate students from all over the country to participate in Green Chemistry research. There were also several opportunities this summer for high school students in the Fargo-Moorhead area to work alongside faculty and graduate students on cutting-edge research projects.

An exciting event that the department is looking forward to is the 8th annual NDSU-KU symposium happening in November 2023 where students and faculty from NDSU will be traveling to Kagoshima, Japan to hear from distinguished speakers and celebrate scientific and cultural interactions between the two universities. The department would also like to recognize faculty member and researcher Dr. Philip Boudjouk who retired this year after 50 years in the department. He was a crucial part of bringing NDSU to its R1 research status and the department is wishing him the best for his next endeavor.





Physics ~ Sigurd Saude

NDSU's Department of Physics and its students were busy this past year. In October, the Department along with Student Government funded four physics students to travel to Washington D.C. for PhysCon 2022, a national conference for physics undergraduates. In addition to hearing inspiring talks, the students were able to tour the NASA Space Goddard Flight Center and the NIST national labs, as well as present their research at a poster session.

The Department of Physics was also involved with several outreach programs, such as Science Fun Night; an event for elementary school students filled with physics demonstrations and interactive tables. It took place at Longfellow Elementary School in North Fargo. The kids (and volunteers) had a blast!

In March, the Society of Physics Students (SPS) NDSU Chapter hosted a Zone Meeting for their fellow SPS chapters from North Dakota and neighboring states of Minnesota, South Dakota, Nebraska, and Iowa. Thirty physics undergraduates visited the NDSU Department of Physics for a weekend that included tours of research labs in the Research 1 Building and the high-performance computing (HPC) datacenter in the Research 2 Building. The students also attended an engaging seminar on star clusters, entitled "The Specific Frequency Globular Cluster Problem," from UND's Dr. Wayne Barkhouse. The meeting concluded with a poster session for undergraduate research and an egg drop contest (pictured on the front cover).

Psychology ~ Nathaniel Hensel

2023 represented another exciting and productive year for the NDSU Psychology department. It was marked by a wide variety of special guest speakers, obtainment of faculty grants, the addition of a new course, and a unique graduate student scholarship.

The guest speakers hosted by the Psychology department in 2023 included the following:

- **Carmen Kho, Ph.D. (NDSU)**
"Youth Development: Contextual and Situational Considerations"
- **Leanna McWood, Ph.D. (NDSU)**
"Contextual and Biological Links with Adolescent Sleep"
- **Natira Mullet, Ph.D. (NDSU)**
"Cultural and familial resilience across generations: Exploring trauma and substance use among racial/ethnic and gender/sexual minorities"
- **Rachel Schwartz, Ph.D. (Stanford University)**
"Using Communication & Emotion Science to Optimize Healthcare Delivery"
- **Jill Nelson, Ph.D. (NDSU)**
"Burnout, Boundaries, and Living BIG"
- **Yinan Cao, Ph.D. (University of Hamburg)**
"Flexible information sampling in human decision-making"
- **Erin Conwell, Ph.D. (NDSU)**
"Buy, By, Bye: Homophone Production and Perception are not in Sync"
- **Jason Yang (University of South Carolina)**
"Leveraging Ambulatory Assessment to Uncover the Real-Life Associations of Movement Behaviors with Brain Health"
- **Kathrin Rothermich (East Carolina University)**
"Social-pragmatic aspects of dynamic language processing"
- **Xinyuan Yan (University of Minnesota)**
"The neural-computational mechanism of exploration-exploitation dilemma, and its implications for psychiatry"
- **Jessie Fu, Ph.D. (University of South Carolina)**
"Using fNIRS to Examine Voice Processing in Children with Familial Risk for Depression"

Each of these accomplished individuals offered a unique insight into their respective fields, providing a worthwhile perspective to those who were able to attend. We encourage you to visit the research of these selected speakers if you have the opportunity. The psychology department is also highlighting the achievements of several professors of their own. Dr. Jeremy Hamm and Dr. Katherine Duggan jointly earned a grant of \$1.6 million from the National Institutes of Health Research to pursue their research regarding The perceived control one has over their lives and the development of dementia.

Dr. Verlin Hinsz was the co-editor of a special issue of the journal *Group Dynamics*. The issue focuses on the January 6th, 2021, insurrection of the U.S. capitol and the group dynamics, processes, and phenomena that took place, as well as its implications on similar situations in the future. A special congratulations to Odalis Garcia, a graduate student in the psychology department, on receiving a 2023 National Science Foundation (NSF) Graduate Research Fellowship! This highly competitive program offers three years of support on Odalis' journey to a Ph.D. Finally, the psychology department welcomed one new course: Behavior Management and Change. This course focuses on the professional applications of behavior management and change in a variety of settings.



Statistics ~ Mandi Hansmeyer

The Department of Statistics was able to offer four new classes this summer with the approval of a new Graduate Certificate in Big Data Analysis. This increased the options for graduate students in the department and will allow them to expand their experience going into their careers. Additionally, a couple of successful events were held in the department, including the Statistics Day and the Red River Valley Statistics Conference. The Statistics day was held on March 24th and around 25 high school students from Northern Cass came to campus to present their data sets from their statistics class. The Red River Valley Statistics Conference was held May 4th and 5th at NDSU and included presentations from undergraduate and graduate students from local institutions.



Mathematics ~ Hannah Khan

The Mathematics Department has flourished this past year. They hosted the 2022 Combinatorics on the Great Plains Conference and will be hosting the “Recent Advances in Harmonic Analysis” Conference in 2023. They hosted three outside speakers this semester, Miklos Bona (University of Florida), Rebecca Rebhuhn Glanz (George Mason University), and Jim Coykendall (Clemson University). Some new courses that will be offered in the summer include a variety of online courses as well as additional courses to support the online programs in ECE and CSCI. This past year, Dr. Jessica Striker received a NSF grant. Two organizations in the mathematics department have continued to have activities throughout the semester including the Math Club and the Graduate Student Chapter of the American Mathematical Society.



NDSU Accelerated Program

HANNAH KHAN

Many departments across NDSU currently offer a five-year program in which students are able to graduate with a bachelor's degree as well as a masters degree within five years. Students begin this program in their junior year at NDSU. I was in the Biological Sciences Accelerated Program and it has allowed my college experience to be shaped in a positive way.

When I accepted my admittance to NDSU, I knew that I wanted to pursue undergraduate research as I had conducted research prior to entering college. However, I also knew that because of the many AP classes I had access to in highschool, I would be graduating in three years. In order to make time for research rather than just focus on coursework, I decided to apply to this program, thus only adding one extra year. I also knew that I wanted to continue my education beyond a masters degree, as my end goal is to become a professor with a focus both in research and teaching. I remember perusing the Biological Sciences website and seeing the vast areas of research that were being conducted in this department alone. However, one lab in particular caught my eye which was Dr. Katie Reindl's Pancreatic Cancer Lab. During my freshman year at NDSU, I reached out to her to see if she would be my mentor for both my undergraduate research as well as my masters degree. Once she agreed, I jumped headfirst into conducting research in her lab.

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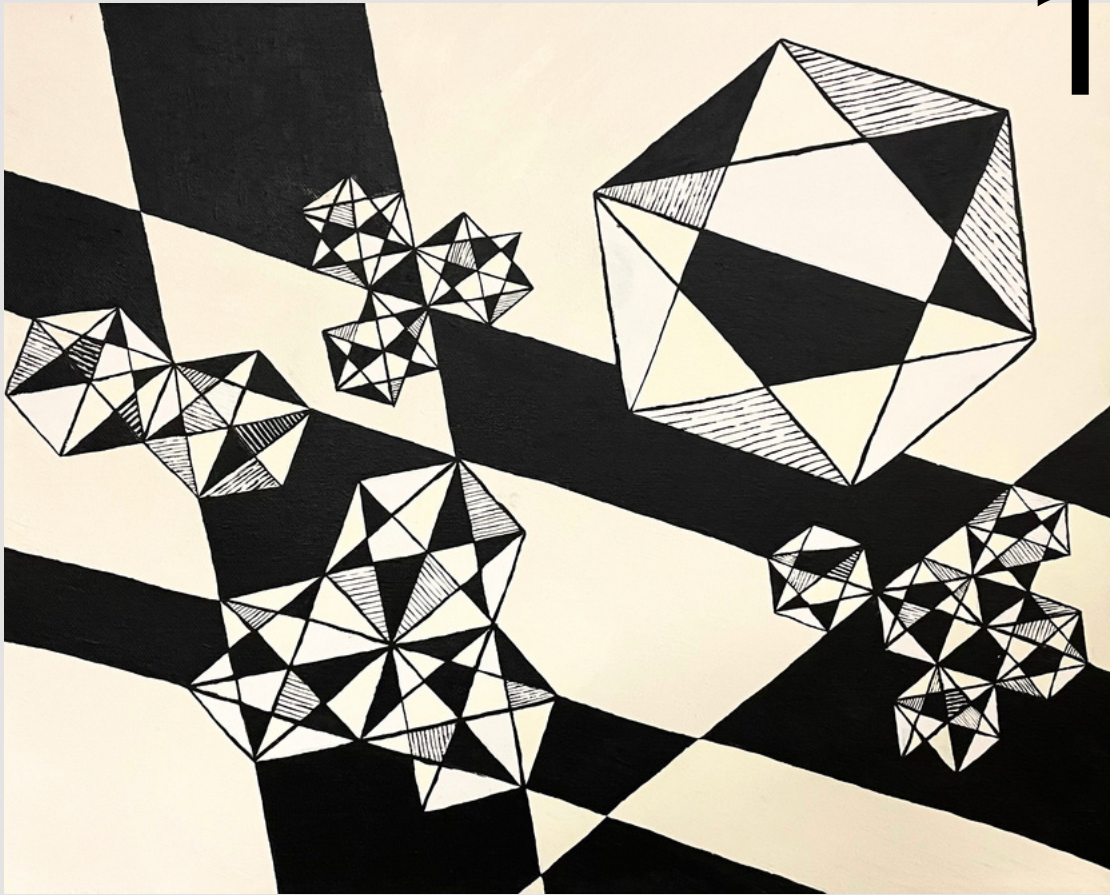
It has also allowed me to continue my passion of learning through research throughout my college experience.

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Without this program offered by NDSU, I would not have been able to conduct as much research during my undergraduate degree while also being involved in many student organizations and activities including the NDSU Orchestra, Medley (Women in STEM), College of Science and Mathematics Ambassadors, as well as Blue Key Honor Society.

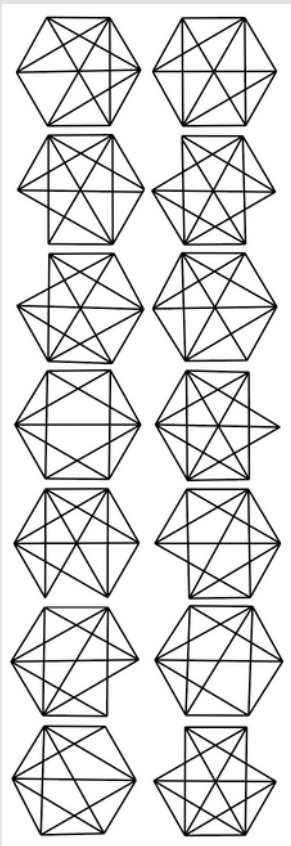
It has also allowed me to continue my passion of learning through research throughout my college experience. Applying to this graduate program has also given me insight into what graduate school applications for my PhD will look like. Overall, this program has been very impactful on my time here at NDSU.

A CONNECTION TO ART



Brooke Bergen

the different non-equivalent graphs, where two graphs are equivalent if one can be obtained by rotating or reflecting the other. After drawing all of the 14 graphs, I sought to create a composition that was interesting to the eye and didn't lay out all of the graphs one after another. I created an optical illusion-inspired painting in which the 14 nonequivalent graphs on 6 vertices with 13 edges can be found. I am thrilled to have found a way to combine two of my passions while wrapping up my time here at NDSU, and am honored to have my painting displayed in the Mathematics Department in Minard Hall.



As a triple major in mathematics, visual art, and Spanish, I am thrilled when I see anything that combines any of these subjects. The summer before starting my capstone project for my mathematics degree, my professor showed me the artwork of James Mai, who studies geometric objects and systems which he then displays in his paintings. I was thrilled to have found a connection between math and art, and decided to write my capstone paper on the types of combinatorial objects that appear in Mai's work, as well as different methods of counting these objects. I wrote about how to count tic-tac-toe boards, various colorings of the faces of a cube, and more.

When looking for a mathematical object that I could use to create a painting, I settled on the different graphs on six vertices that have 13 edges. I wanted my painting to display all of

On the left are the 14 graphs, see if you can find each one in the painting above!

2023 Southeast Science and Engineering Fair Award Recipients

Junior Division Runner-Up Sweepstakes

Amla Prochnow: The Application of Citrus Extract as an Antimicrobial

Junior Division Sweepstakes

Evelyn Chambers: Generative AI: Can It Fool the Human Senses?

Senior Division Runner-Up Sweepstakes

Patrick Shen: Do Single-Cell Hi-C Data Follow a Power-law Decay?

Earl Krushwitz Sweepstakes Award

Gavin Kratcha: Sustainable Hydroponic Production Using Automated Agricultural Nutrient Reclamation

Patty Kratcha - SERSEF Director

Tina Pierce - SERSEF Assistant Director

