COORDINATOR OF UNDERGRADUATE RESEARCH ANNUAL REPORT 2020-21

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Student researcher Sammuel Drummond working in the Habeger Science Center lab.
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Photos courtesy of the Dakota State University Marketing and Communications Department
WHY UNDERGRADUATE RESEARCH?

A strong undergraduate research culture benefits:

STUDENTS
When we include students in the research culture of the university, we demonstrate that we view them as vital to the creation of new knowledge. Involvement in research establishes important connections with the university -- a sense of belonging that is important to retention. Providing opportunities for students to create an intellectual home at the university is especially important to medium-sized institutions where students expect to work closely with their professors.

Undergraduate research opportunities leverage some of our greatest assets as a teaching institution where we understand that establishing productive mentoring relationships is associated with student retention and persistence to graduation.

Our project received considerable attention since our study is an economically viable line of research relevant to the state of South Dakota.
--Andrew Sathoff, Mentor and Assistant Professor of Biology

FACULTY & SCHOLARSHIP
The mentor relationships also benefit faculty. Undergraduates bring opportunities for faculty to expand their research through new perspectives and by providing assistance to accomplish time-consuming tasks. Co-mentor relationships can breathe new enthusiasm into projects and classrooms. Through scholarship, faculty model the level of passion and interest required of the field of study, which helps prepare students for successful careers in their future fields. By investing in our students, we are investing in the next generation of scholars.

COMMUNITY & SOCIETY
Undergraduate research often focuses on projects that benefit local communities or our society at large. These community-centered research projects provide opportunities to collaborate with other universities and organizations through grants and publications. The opportunities also raise public awareness about the work and priorities that are valued at DSU.
Each year since 2017, we select a new group of undergraduates to serve as leaders in research.

The Undergraduate Student Mentored Research Initiative Awards (USMRI) promote undergraduate research through a variety of activities:

- funded research opportunities
- faculty mentorship
- presentations at the DSU Research Symposium
- presentations at local and regional venues
- publication fees
- travel and conference registration stipends
- scholarship and fellowship opportunities

"I will talk to people from all across the country about science, not just people from my hometown or people that I know."
-Hope Juntunen, Student Researcher, 2019
**USMRI AWARDS**

**COLLEGE OF ARTS AND SCIENCES**
- Samuel Drummond, a physical science major from Seaford, Victoria, Australia; faculty supervisor Dr. James Maloney.  
  Project title: “Radiation Shielding for Nuclear Thermal Propulsion.”
- Jennifer Giles, a biology major from Madison, S.D.; faculty supervisor Dr. Andrew Sathoff.  
  Project title: “Isolation and Characterization of Pythium spp. from South Dakota soils under commercial alfalfa production.”
- Olivia D. Hermosilla, a production animation and computer game design double major with an emphasis on art, from West Linn, Oregon; faculty supervisor Daniel Seman.  
  Project title: “Coyote Steals Fire.”
- Conner Tordsen, a biology major with chemistry and health minors, from Fairmont, Minn.; faculty supervisor Dr. Andrew Sathoff.  
  Project title: “Pathogenicity and Fungicide Sensitivity of South Dakota Field Isolates of Aphanomyces euteiches.”

**THE BEACOM COLLEGE OF COMPUTER AND CYBER SCIENCES**
- Tarek Abdelmotaleb, a cyber operations major, living in Madison S.D.; faculty supervisor Andrew Kramer.  
- Odin Bernstein, a cyber operations major from Newport, R.I.; faculty supervisor Dr. Josh Stroschein.  
  Project title: “Evading Modern Antivirus Detection.”
- Keinen Bousquet, a computer science major from Madison, S.D.; faculty supervisor Andrew Kramer.  
  Project title: “Reviving a Dinosaur: Analyzing Web Assembly Compilation Compatibility with Microsoft BASIC for Web Utilization.”
- Steven Masley, a cyber operations major, from Southern Pines, N.C.; faculty supervisor Dr. James Maloney.  
  Project title: “Genetic Algorithm for Radiation Shielding.”

**COLLEGE OF BUSINESS AND INFORMATION SYSTEMS**
- Brandon Van Rosendale, a computer information systems major, specializing in business analytics, from Madison, S.D.; faculty supervisor Dr. Rob Girtz.  
  Project title: Analyzing Relationships between Personality, Job Matching, Wages, and Life Satisfaction

**22%** of USMRIs were awarded to students from underrepresented groups in higher education

**TOTAL FUNDS AWARDED**

- Mentors: $4,500
- Students: $7,200
- Underrepresented Groups: $2,700
HIGHLIGHTS

Jenni Giles presented at the 2021 Student Research Poster Session at the State Capitol

James Maloney was nominated by his colleagues for the Council on Undergraduate Research (CUR) Physics and Astronomy Mentor Award for 2021

undergraduates presented at the 2021 Spring Research Symposium representing each of the colleges.
LOOKING FORWARD

- Align with and implement the goals of the 2021 Strategic Plan
- Establish an Academy of Undergraduate Researchers Across SD
- Create research projects database
- Utilize Federal Work-Study dollars to increase undergraduate research opportunities on campus and increase diversity and inclusion
- Return to organizing and hosting an in-person poster session for the symposium and to giving out the research awards
- Create timeline and checklist documentation for USMRI participants
- Work on creating assessment tools for the USMRI program
- Revise the Undergraduate Research website

For Pillar 3: Research of the 2021 Strategic Plan, I proposed establishing an Academy of Undergraduate Researchers Across South Dakota.

This model links undergraduate research happenings and opportunities through networking and partnerships. Collaborating with the undergraduate research efforts at other BOR institutions (and elsewhere), the Academy promotes visibility, community, and partnership.

And, importantly in my mind, it would position DSU as a leader in undergraduate research.
2020-21 USMRI APPLICATION REVIEW COMMITTEE

Bramwell Brizendine, Assistant Professor of Computer & Cyber Sciences, The Beacom College of Computer and Cyber Sciences

Mary Francis, Reference & Instruction Librarian, Karl Mundt Library

Haley Larson, Assistant Professor of English for New Media, College of Arts and Sciences

David Zeng, Assistant Research Professor of Information Systems, College of Business and Information Systems

Stacey Berry, Associate Professor of English for New Media/Undergraduate Research Coordinator, College of Arts and Sciences