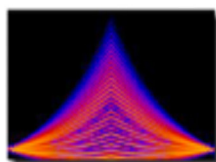




UNC GREENSBORO



RISE Network
Promoting research and instruction in STEM education

ANNUAL REPORT

2019-2020

Supporting STEM Education and Research at UNCG by facilitating faculty networking, professional development, public outreach, and small grants.



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To Our Stakeholders

A YEAR THAT WAS...UNIQUE

The 2019-2020 academic year was the 10th year of the RISE Network at UNCG. It was a transition year for RISE, as Co-Directors Lynn Sametz and Malcolm Schug stepped down from their leadership roles in July 2019. Christopher Rhea (Department of Kinesiology) and Tracey Howell (Department of Mathematics and Statistics) took over the reins as the Director and Associate Director, respectively. The Fall semester was primarily used to plan the path forward by the new leadership team, which led to 10 events in the Spring semester that were to be led, co-led, or supported by the RISE Network. As everyone knows, COVID-19 began impacting our campus in mid-Spring, leading to the cancellation of nearly half of our events. Nevertheless, the time spent planning the Spring 2020 events will be helpful as our leadership team pivots to what will likely be a year of mostly (if not entirely) virtual RISE events for 2020-2021.

STRATEGIC HIGHLIGHTS

The 10 events that were planned for the Spring 2020 semester supported our mission to “enhance and expand partnerships between research educators and science, mathematics, and technology educators at UNCG and in the community, by developing a network of interested partners to coordinate STEM education and research activities across campus.” This included our ongoing commitment to the RISE Speaker Series, organizing professional development and networking events to connect and broaden UNCG STEM education and research efforts, co-leading the Science Everywhere festival—an event that attracts 3000-5000 community members to campus every Spring—, supporting local K-12 science fairs in their planning and execution, providing education and research guidance to our UNCG STEM community, and participating in press/advocacy efforts. Due to COVID-19, we were only able to run 6 of the 10 planned events. Additionally, we continued our investment in UNCG STEM education research by providing a \$5,000 RISE Small Grant to support Dr. Maia Popova in the Department of Chemistry and Biochemistry for a research project titled “Chemistry Instructors’ Beliefs and Practices Toward Developing Student Representational Competence.”

FINANCIAL HIGHLIGHTS

In a testament to RISE’s cross-unit connections, our personnel and events were supported by many units at UNCG, including the Office of the Provost, Vice Chancellor for Research and Economic Development, Dean of the College of Arts and Sciences, Dean of the School of Health and Human Sciences, Dean of the School of Education, and the Departments of Biology, Chemistry & Biochemistry, Kinesiology, Mathematics & Statistics, Physics, Computer Science, and Geography, Environment, & Sustainability. Collectively, these units provided \$50,250 to support administrative time for the RISE Director and Associate Director, a RISE Graduate Assistant, the RISE Speaker Series, networking and professional development events, and the RISE Small Grant program. Additionally, the Office of the Provost provided \$20,500 to support the Science Everywhere event that RISE co-leads, and RISE leadership worked with University Advancement to raise another \$14,250 to support Science Everywhere.

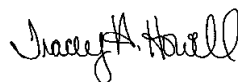
LOOKING AHEAD

The 2020-2021 academic year presents many challenges associated with the management of the ongoing COVID-19 pandemic. Nevertheless, the RISE Network is committed to our continued mission to synergize STEM education and research on our campus and in our community. This coming year will look different than in years past, with many (if not all) of our events to be presented in a virtual format. The resiliency of the RISE Network will allow us to rise above these challenges to help UNCG prosper in these challenging times. Lastly, we would be remiss not to thank Nabeela Farhat, who served as the RISE Graduate Assistant for several years. We would not have been able to accomplish half of our work without her. Thank you, Nabeela! We welcome Krista Meder to our team, who will be taking over for Nabeela as the new RISE Graduate Assistant.

Sincerely,



Christopher K. Rhea – RISE Director



Tracey H. Howell – RISE Associate Director

Programming Overview

The following was the schedule of events for the Spring 2020 semester. The four events in March and April were cancelled due to COVID-19.

January

JANUARY 27: RISE SPEAKER SERIES

SPEAKER: Dr. Danielle Speller (Yale University)

TALK TITLE: “From Darkness to Light: The Search for Axions and other New Physics”

MORE INFORMATION: Reception: 3:30-4:00; Presentation 4:00-5:00pm in Petty 136

February

FEBRUARY 1: NORTH CAROLINA REGION 5 SCIENCE & ENGINEERING FAIR

TIME AND LOCATION: All day; The Middle College at UNCG

MORE INFORMATION: ncsefreg5.stemwizard.com/

FEBRUARY 4: RISE NETWORK “DROP-IN”

PURPOSE: Kick off your semester with some cookies/coffee and informally mingle with RISE Network leaders to learn what our Network does and how it can support your work.

TIME AND LOCATION: 3:30-4:30, Faculty Center

FEBRUARY 10: RISE SPEAKER SERIES

SPEAKER: Dr. Nick Stergiou (University of Nebraska At Omaha)

TENTATIVE TALK TITLE: “Developing a World-class STEM Research and Education Program at a High Research Activity (R2) University”

TIME AND LOCATION: Reception: 3:30; Presentation: 4:00-5:00pm in MHRA 1214

FEBRUARY 22: GREENSBORO REGIONAL SCIENCE OLYMPIAD

TIME AND LOCATION: All day; UNCG campus

MORE INFORMATION: www.sciencenc.com/tournaments/middle-high/locations/greensboro/

FEBRUARY 26: NATIONAL INSTITUTES OF HEALTH LOAN REPAYMENT PROGRAM (NIH LRP) WORKSHOP

HOST: Co-sponsored by RISE and the UNCG Office of Sponsored Programs

TIMING AND LOCATION: 2:00-3:30 in Faculty Center

RSVP: workshops.uncg.edu

March

MARCH 19: RISE SPEAKER SERIES

SPEAKER: Dr. Jerrod Henderson (University of Houston)

TENTATIVE TALK TITLE: “Motivating Factors for Underrepresented Students to Stay in STEM Disciplines”

TIME AND LOCATION: Reception: 3:30; Presentation: 4:00-5:00pm, location SOEB 226

MARCH 20: PROJECT KALEIDOSCOPE (PKAL) REGIONAL MEETING

SPEAKER: Dr. Jerrod Henderson (University of Houston) & Dr. Ayesha Boyce (UNCG)

TIME AND LOCATION: 8:00am-5:00pm in the Virginia Dare Room at the UNCG Alumni House

April

APRIL 2: AUTHORSHIP ETHICS WORKSHOP

HOST: Co-sponsored by RISE and the UNCG Office of Research Integrity

TIME AND LOCATION: 2:00-3:30pm in Faculty Center

RSVP: workshops.uncg.edu

APRIL 25: SCIENCE EVERYWHERE

HOST: Co-sponsored by RISE and the UNCG Provost’s Office

THEME: “The Future”

TIME AND LOCATION: 12:00-4:00pm on UNCG Campus

RISE Speaker Series

The goal of the RISE Speaker Series is to bring nationally recognized experts in STEM research and instruction to UNCG. The Speaker Series helps stimulate conversations and generate new ideas around STEM education and research at UNCG. The Speaker Series reaches a broad audience, including UNCG faculty, postdocs, administrators, staff, graduate students, and community members. The Speaker Series is supported by funds from College of Arts and Sciences, the School of Education, and the School of Health and Human Sciences. We would like to thank all the funders for making the 2019-2020 RISE Network Speaker Series a success.

Below is a list of the three speakers for the 2019-2020 RISE Speaker Series. Due to COVID-19, we were only able to host Dr. Speller in January and Dr. Stergiou in February. Although we had to cancel Dr. Henderson's talk, we anticipate inviting him to be a RISE Speaker Series participant in the 2020-2021 academic year in a virtual format. The promotional flyers, detailed itineraries, and pictures are provided in Appendix 1 to highlight each speaker's integration with our campus community during their visit.



January 27, 2020

Dr. Danielle Speller, Department of Physics, Yale University

Talk Title: "From Darkness to Light: The Search for Axions and other New Physics"



February 10, 2020

Dr. Nick Stergiou, Department of Biomechanics, University of Nebraska at Omaha

Talk Title: "Developing a World-class STEM Research and Education Program at a High Research Activity (R2) University"



March 19, 2020

Dr. Jerrod Henderson, Cullen College of Engineering, University of Houston

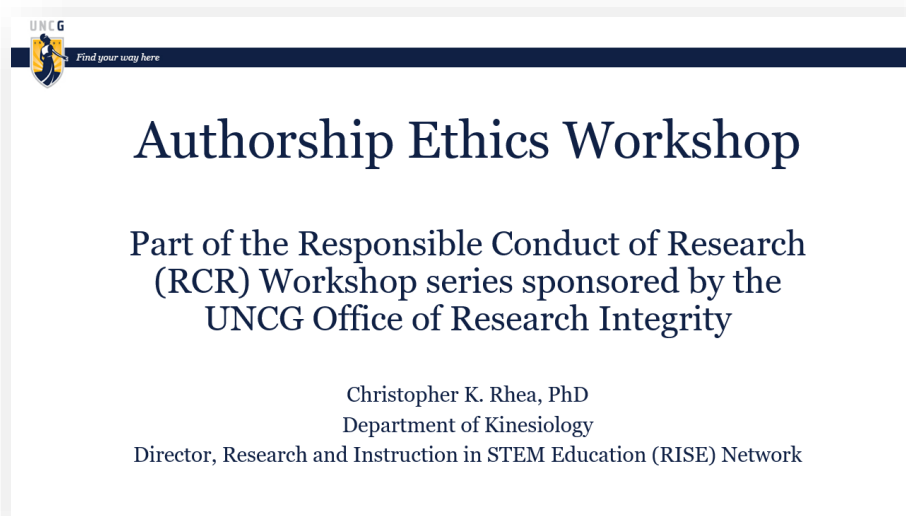
Talk Title: "Repairers of the Breach: A Conversation about the 'Leaky STEM Pipeline'"

Professional Development Events

We planned two professional development workshops for Spring 2020. The first was given on February 26 and focused on the National Institutes of Health Loan Repayment Program (NIH LRP). It was co-sponsored by the UNCG Office of Sponsored Programs. The NIH LRP is a student loan forgiveness program funded by NIH for postdocs and faculty pursuing research in the biomedical sciences that are deemed a priority for NIH. The program will pay to up \$50,000/year toward the researcher's student loans. RISE Director Christopher Rhea is a three-time recipient of the NIH LRP and he led the workshop that focused on eligibility, repayment logistics, research programs supported by the LRP, application types, timeline, and elements of the application. The full slide deck is in Appendix 2.




We had also planned to offer a workshop on April 2 focused on Authorship Ethics that was co-sponsored by the UNCG Office of Research Integrity. However, COVID-19 caused us to cancel this workshop. It has been rescheduled for November 2020 in a virtual format.



Project Kaleidoscope (PKAL)


Project Kaleidoscope (PKAL) is at the center of the Association of American Colleges & Universities' (AAC&U) effort to reform STEM in higher education. PKAL is dedicated to empowering STEM faculty, including those from underrepresented groups, to graduate more students in STEM fields who are competitively trained and liberally educated. In addition to the PKAL meeting at the National AAC&U Annual Meeting, PKAL supports state networks to run regional meetings that align with their national agenda. For the first time, the RISE Network agreed to host a PKAL meeting at UNCG. The theme of our meeting was "Equity, Diversity, and Inclusion in STEM: Opportunities to Level the Playing Field." The meeting was set for March 20 and 60 STEM educators from across the state registered before we had to cancel the meeting due to COVID-19. We intend to run a virtual version of the meeting during the 2020-2021 academic year. An overview of the workshop and our facilitators' topics/bios are presented below and on the next page.



Association of American Colleges & Universities
A VOICE AND A FORCE FOR LIBERAL EDUCATION

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2020 North Carolina PKAL Regional Network Spring Meeting

Equity, Diversity, and Inclusion in STEM: Opportunities to Level the Playing Field
March 20, 2020
University of North Carolina at Greensboro
Alumni House
404 College Avenue
Greensboro, NC 27412

Project Kaleidoscope and the University of North Carolina at Greensboro (UNCG) are pleased to announce the 2020 meeting of the North Carolina PKAL Regional Network: "Equity, Diversity, and Inclusion in STEM: Opportunities to Level the Playing Field". The meeting will be held on Friday, March 20, 2020 in the Alumni House on UNCG's campus in Greensboro, North Carolina.

Event Synopsis

Equity, diversity, and inclusion have become focal points across the educational landscape, ranging from K-12 education to post-secondary education to faculty hiring/development/retention spaces. STEM education is included in this conversation, as many STEM educational programs may not fully attend to equity, diversity, and inclusion principles. The goal of our North Carolina PKAL Regional Network event is to focus on these principles from a faculty-to-student perspective and a faculty-to-faculty perspective. The objective of the morning workshop is to discuss topics relative to motivating underrepresented undergraduate and graduate students to stay in STEM disciplines, whereas the afternoon workshop will focus on the recruitment, development, and retention of a diverse faculty working in STEM education.

Featured Workshops

Motivating factors for underrepresented students to stay in STEM disciplines



Dr. Henderson is an Instructional Assistant Professor at the University of Houston in the Cullen College of Engineering where he is a part of the first-year engineering experience team. He was recently appointed by the Dean of the College as the Director of the Program for Mastery in Engineering Studies (PROMES), a program aimed at increasing engineering student achievement, engagement, and graduation rates. His research interests are in engineering identity formation and persistence among underrepresented students, especially African American males.

Equity, diversity, and inclusion considerations among STEM faculty



Dr. Boyce is an Assistant Professor in the Department of Educational Research Methodology in the School of Education at UNCG. She is also the Co-Director of the UNCG Office of Assessment, Evaluation, and Research Services (OAERS). Her research focuses on attending to value stances and issues related to diversity, equity, inclusion, access, cultural responsiveness, and social justice within evaluation—especially multi-site, STEM, and contexts with historically marginalized populations. She also examines teaching, mentoring, and learning in evaluation. She has evaluated over 40 programs funded by the National Science Foundation (NSF), US Department of Education, National Institutes of Health, and Spencer and Teagle foundations. She is currently the external evaluator for five NSF funded projects and a Co-Principal Investigator on four NSF funded projects. She is a Co-PI on the recently funded 1 million-dollar NSF grant, Spartans ADVANCE: Adaptations of Practices For Faculty Equity, Diversity, and Inclusion at The UNCG. She encourages students to develop a strong methodological foundation, conduct studies based on democratic principles, and promote equity, fairness, inclusivity, and diversity.

Event Registration

Click [HERE](#) to register. The general registration fee is \$55 per person and include lunch; graduate student registration is \$25.

The registration deadline is **March 11, 2020**. Space is limited.

Non-tenure-track STEM faculty are encouraged to attend, and are eligible to receive a registration fee waiver. Waivers are limited. First-come, first served. The waiver is contingent on participation in a one-hour listening session for non-tenure track STEM faculty attendees and the PKAL executive office. This listening session will serve to inform the future ways in which PKAL is able to ensure that the professional development needs of our non-tenure track colleagues are met. To receive the waiver, register [online](#)

Science Everywhere



[Home](#)

[About Science Everywhere](#)



WELCOME!

THIS YEAR'S UNCG SCIENCE EVERYWHERE FOCUSES ON "THE FUTURE"

The wonders of science are EVERYWHERE – from our bodies, to the world around us, across our state to all the way into outer space! Science Everywhere at UNCG is a community event, part of the NC Science Festival. Science Everywhere explores biology and chemistry, math and technology, ecology and sustainability, art, and more. We hope you will visit our campus and learn about the science that surrounds you every day.

Join us from noon – 4 p.m. on Saturday, April 25, 2020 on the UNCG campus, for the 6th annual Science Everywhere event will provide STEM activities to everyone who wants to discover new ideas and unlock their imagination. All activities will connect experts with members of the public through hands-on science activities, promote career awareness in STEM, and engage a diverse community of learners. The goal of Science Everywhere is to infuse young people with a sense of the exciting and interesting applications of STEM, encouraging them to open their imagination to pursuing education and/or a career related to STEM.

All events are free and open to the public.

Saturday, April 25 Event Details:

Location: UNC Greensboro. Events take place at Kaplan Commons located in front of Elliott University Center (EUC), the UNCG School of Education, the Petty Science Building, and the Mary Channing Coleman Building.

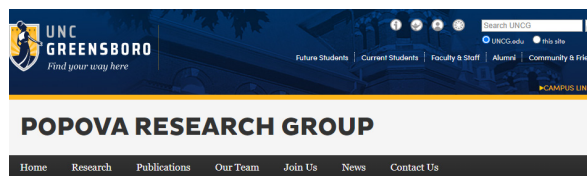
In case of rain, the festival will continue with some events moving indoors to the Elliott University Center.

Parking at Melver Deck: 132 Melver Street

Parking at Walker Deck: 1510 Walker Avenue

RISE Small Grant Program

The RISE Network helps facilitate STEM education and research via our Small Grant Program. This program is funded by contributions from various STEM departments at UNCG who provide \$250-\$500 toward this effort. A call for proposals is made to UNCG faculty who wish to apply for funding to support their research program. This year's winner of the \$5,000 grant was Dr. Maia Popova (pictured below), who is an Assistant Professor in the Department of Chemistry and Biochemistry. Her proposal was titled "Chemistry Instructors' Beliefs and Practices Toward Developing Student Representational Competence." The funding call for the Small Grant Program is in Appendix 4 and Dr. Popova's winning proposal is in Appendix 5.



Maia Popova, Assistant Professor, Department of Chemistry & Biochemistry

Chemistry Instructors' Beliefs and Practices Toward Developing Student Representational Competence

Proposed Project: Learning and communicating with representations is an essential component of chemistry instruction.¹⁻⁵ The process of successfully using multiple representations in order to think about, communicate, and create meaning for a phenomenon defines representational competence (RC).² Although a wide body of literature has focused on exploring chemistry students' RC skills,⁶⁻¹⁰ no studies have examined chemistry instructors' practices toward developing student RC. The goal of this study is to fill this gap by pursuing the following *objectives*: a) to explore chemistry instructors' pedagogical content knowledge (PCK)¹² and beliefs¹³ toward developing student RC (*Study 1.1*), b) to investigate what strategies instructors use to develop and assess RC in their courses (*Study 1.2*), and c) to identify the alignment between instructors' beliefs and practices (*triangulation of data from Study 1.1 and Study 1.2*).

K-12 Science Fair Promotion/Assistance

As part of our ongoing effort to support K-12 science, the RISE Network helped promote and plan two science fairs hosted on our campus this past year. On February 1, we hosted the North Carolina Science and Engineering Fair. RISE assisted with the event planning and helped with staffing for the judges. On February 22, the Greensboro Region of the North Carolina Science Olympiad was hosted on our campus and RISE assisted with promotion of this event.



STEM Education and Research Guidance

RISE is commonly called upon to help facilitate and/or support research programs on our campus. Below is a synopsis of those opportunities this year.

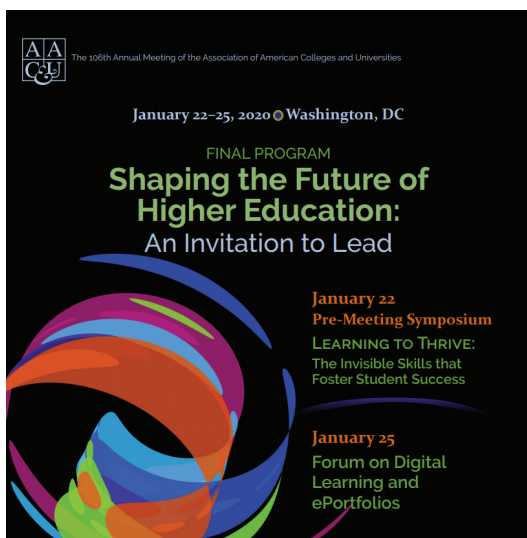


STAMPS

Science, Technology and Math Preparation Scholarships

The STAMPS (Science, Technology and Math Preparation Scholarships) Program at UNCG is supported by the National Science Foundation and it offers scholarships of up to \$4,000 per year for academically talented undergraduate students in the sciences. The primary goal of the STAMPS program at UNCG is to provide financial and community support for undergraduate students who are majoring in Biology, Chemistry, Computer Science, Geography, Mathematical Sciences, and Physics and Astronomy. Students are awarded scholarships based on a demonstration of both a significant promise for success in science/math and a measurable financial need. In addition to financial support, STAMPS incorporates a variety of community-building measures including peer mentors, a science colloquium series, tutoring, and field trips to research facilities. The program was funded by the National Science Foundation and UNCG Office of the Provost. The RISE Network serves at the advisory board for the STAMPS program.

Faculty leaders from the STAMPS Program (including RISE members) were invited to present their research on the program at the Annual Meeting of the Association of American Colleges and Universities (AAC&U). The presenters used an innovative skit performance to present the data (see picture below). The RISE Director was in attendance for support.



Undergraduate STEM Reform: From Initiative to Institutionalization

Marquis Salon 14 (Level M2)

Project Kaleidoscope is pleased to feature the University of North Carolina Greensboro Science, Technology, and Math Preparation Scholarships (STAMPS) project—generously funded by the National Science Foundation's S-STEM Program—that boasts an 87% graduation rate for its participating STEM majors. Since its inception, STAMPS has built a cohort-based, supportive community of STEM students and faculty dedicated to broadening students' knowledge of the interconnectedness of STEM disciplines, career opportunities, and cutting-edge research. A new iteration of STAMPS was initiated in 2017 to include an educational research component that required and now relies upon the expertise of an interdisciplinary team of STEM educational researchers, STEM faculty, program evaluators, program managers, and undergraduate participants of STAMPS. As a result of our most recent effort, we have been able to fully document the impact of STAMPS activities on STEM student identity, self-efficacy, and sense of belonging.

AYESHA BOYCE, Assistant Professor and Codirector of the Office of Assessment Evaluation, and Research Services, **MALCOLM SCHUG**, Associate Professor and Interim Head, Department of Biology; **LEE PHILLIPS**, Director, Undergraduate Research, Scholarship and Creativity Office; **LYNN SAMETZ**, STAMPS Project Codirector and Codirector of Community Research and Instruction in STEM Education (RISE); **JEFFREY PATTON**, Professor and STAMPS PI; **AMY GERMUTH**, External Evaluator; **ADEYEMO ADETOGUN**, **CHERIE AVENT**, **MICHELE ABBE**, and **NICOLE HAWKS**, PhD students—all of the University of North Carolina at Greensboro



STEM Education and Research Guidance



The MARC U-STAR (Maximizing Access to Research Careers Undergraduate Student Training in Academic Research) Program at UNCG is supported by the National Institutes of Health (NIH) and seeks to increase the number of individuals from groups that are underrepresented in biomedical sciences by preparing students for high-caliber graduate training at the PhD level. The goal of the program is to help create a more diverse research work force by working to: (1) prepare UNCG students during their junior and senior year to be the research scientists of the future and (2) support and

enhance an atmosphere conducive to undergraduate research in the sciences at UNCG. Students accepted to the MARC U-STAR program participate in activities designed to enhance their confidence, academic skills, and technical abilities. Two of the Marc U-STAR Primary Investigators serve on the RISE Advisory Board. They provide monthly reports to RISE on their progress and RISE provides general assistance with the program with respect to promotion and execution of the activities.

This year the RISE Director was asked to serve on an internal review panel to help decide which UNCG proposal(s) would be submitted to the National Science Foundation (NSF) Major Research Instrumentation (MRI) program. Three preliminary proposals were vetted in the Fall semester, with one given encouragement to proceed. The review panel continued working with the proposal team in the Spring semester to ensure alignment with NSF's guidelines.



The RISE Director reviewed an NSF Career Award proposal submitted by Somya Mohanty in the Department of Computer Science and provided a letter of support indicating RISE's enthusiasm to partner with Somya for his proposed Career Award community outreach activities.

Dr. Sherine Obare began her tenure as Dean of the Joint School of Nanoscience and Nanoengineering (JSNN) in the 2019-2020 academic year. To assist with her strategic planning for JSNN's future, she requested that several faculty and staff from UNCG, NCA&T, and the Greensboro community participate in a focus group run by an external consultation company. The RISE Director participated in the focus group in June 2020 to provide UNCG STEM research and education context.



Press/Advocacy

UNCG Chancellor Gilliam was interviewed by Authority Magazine on a wide range of topics relative to United States higher education. Included in the conversation was the Chancellor's thoughts on STEM education and engagement, to which he acknowledged the RISE Network's efforts on UNCG's campus.



UNC Greensboro Chancellor Dr. Franklin D. Gilliam, Jr.: "Here Are 5 Things That Should Be Done To Improve The US Educational System"



How is the US doing with regard to engaging young people in STEM? Can you suggest three ways we can increase this engagement?

Although I agree that focus and importance needs to be placed on STEM and getting young people engaged early, the future of American universities does not lie in the disciplines. The more specialized a university becomes, the more you're taken away from the kind of collaboration and lateral thinking that is required for true discovery.

That all being said, the US education system as a whole can increase engagement in STEM by opening doors for students through scholarships and exposing youth to STEM prior to their high school experience with summer camps and workshops in local public middle schools. UNCG hosts a National Science Foundation-sponsored "Science Everywhere" community event every year that's free and open to the public. **At UNCG specifically, we've seen dramatic improvement in STEM education through a variety of different on-campus immersive and collaborative initiatives, including the decade-long RISE Network, a coalition of educators and researchers involved in STEM education. The network provides access to STEM funding and research opportunities, and promotes working partnerships. Network members include UNCG faculty and researchers, community educators and grant specialists.**

Press/Advocacy

In November, UNCG installed artwork in the Legislative Building in Raleigh. It was located on the second floor, outside of the legislative galleries and highlights our Science Everywhere event. A picture of the installed artwork is below.



UNCG Science Everywhere

The wonders of science are **EVERYWHERE** – from our bodies, to the world around us, all over our state, and all the way to outer space! Each April, UNC Greensboro welcomes children and youth of all ages to explore nearly 100 hands-on science activities at UNCG's Science Everywhere Festival, an official North Carolina Science Festival. Participants enjoy shows in the planetarium, constructing and coding robots, making a DNA necklace, turning fruits and vegetables into a piano, printing 3D objects, and enjoying delicious liquid nitrogen ice cream. From nanoscience to K-9s, reptiles, and amphibians, there's something for everyone at UNCG's Science Everywhere.



Proposed Action Items for 2020-2021

The upcoming academic year will be very different than previous years due to the pandemic. Thus, RISE has planned several virtual events that will allow us to continue our mission in a socially distanced way. The major elements in our 2020-2021 portfolio are:

1. **RISE Virtual Speaker Series** – Consistent with previous years, three presenters will be recruited to speak to our UNCG faculty, with one speaker relevant to faculty in each of the units funding this venture (College of Arts and Sciences, School of Education, School of Health and Human Sciences). The talk and smaller group meetings will occur virtually, allowing for the potential of a wider audience gathering from UNCG and surrounding community. The Speaker Series events will be spaced out over the Fall and Spring semesters.
2. **PKAL Meeting** – We have received permission from the AAC&U national office to run a virtual version of the PKAL meeting that we had planned for last March. It will have the same theme (Equity, Diversity, and Inclusion in STEM). We have begun our planning and we intend to host this meeting in the Spring semester.
3. **Science Everywhere** – We plan to host a virtual version of the Science Everywhere event in the Spring. What exactly that will look like is still under consideration. We will connect with experts in this area to identify best practices for providing an engaging experience for our targeted K-12 audience.
4. **RISE Small Grant Program** – Pending funding from the STEM departments, we intend to offer this program again this year, with the potential of offering a call for proposals that test/identify best practices for remote STEM education, aligning with needs in the current pandemic.
5. **Workshops and Professional Development Events** – Since the Authorship Ethics workshop co-sponsored by the Office of Research Integrity was cancelled due to COVID-19 last April, we will offer it in November. We are also co-sponsoring a movie screening of [Picture A Scientist](#), a film that chronicles three women scientists and their academic journey, including brutal harassment and subtle slights. We are exploring other workshops or events that may be timely for our campus community.

In addition to the aforementioned items, we will continue to:

1. Advocate for the recruitment of STEM education and research faculty.
2. Support new STEM faculty through encouraging their involvement in grant opportunities, networking activities, mentoring, and linkages to other STEM related faculty.
3. Support the submission of grant proposals that increase our ability to attract and retain quality STEM research and education students, particularly women and underrepresented groups.
4. Facilitate preparation of interdisciplinary NSF, DOD, NIH, DOE, and foundation grant applications.
5. Serve as Advisory Board for funded activities promoting STEM Education, such as the STAMPS Program.
6. Facilitate UNCG's STEM funded programs, such as MARC U-STAR and NSF ADVANCE.
7. Continue to maintain and promote the RISE Network webpage and social media.
8. Support the University Teaching and Learning Commons (UTLC) to promote quality STEM teaching and learning at UNCG.
9. Identify opportunities to collaborate with local businesses, community and state networks, JSNN, Gateway, and NCA&T to support STEM research, education, and outreach efforts; and identify leadership opportunities for UNCG in STEM research and education.
10. Provide additional connections to our Alumni for the purposes of highlighting STEM research and education at UNCG, making connections for internships, and promoting campus activities.

Connection with the UNCG Strategic Plan

RISE serves as a node within our broader campus network for the “Areas of Transformation” identified in our strategic plan. Current effort in the Student Transformation area is focused on experiential learning and co-curricular/extracurricular offerings, which is supported by RISE through our effort with STAMPS and MARC U-STAR Programs. University effort in this area is also being placed on enrolling and graduating students, for which support while enrolled is incredibly important. RISE meets these challenges by inviting undergraduate and graduate students to our Speaker Series, PKAL meeting, Science Everywhere, workshops, and professional development events. The Knowledge Transformation area is supported by RISE through our participation in STEM research and education initiatives (scientific evaluation of the STAMPS program, reviewing campus STEM grants) and translating research to practice via our workshops. Lastly, regional transformation is supported by RISE through our commitment to community events, such as Science Everywhere that includes outreach to underrepresented communities, and by running the PKAL meeting focusing on Equity, Diversity, and Inclusion in STEM that is open to attendees from all of North Carolina.



AREAS OF TRANSFORMATION

Transformation is conceived of as a pervasive and enduring process driving the University forward. Transformation is at the heart of higher education.



STUDENT TRANSFORMATION

Student transformation occurs when students acquire knowledge and develop skills and habits of mind necessary to be life-long learners, informed and engaged members of society, and successful in life and work.



KNOWLEDGE TRANSFORMATION

Knowledge transformation occurs when understanding is enhanced through research, creative activity, critical analysis, and translation of research to practice.



REGIONAL TRANSFORMATION

Regional transformation occurs when local economies are strong and well-aligned with current and future needs, and when equitable access is provided to a reasonable standard of living and quality of life for all.

RISE Network Advisory Board



Christopher K. Rhea, RISE Director,
Department of
Kinesiology



Tracey H. Howell, RISE
Associate Director,
Department of
Mathematics & Statistics



Amy Adamson,
College of Arts and
Sciences Office of
Research



Malcolm Schug,
Department of Biology



Omari Dyson,
Department of Peace
& Conflict Studies



Bob Henson, School
of Education Office
of Research



Lynn Sametz, Department
of Geography,
Environment, and
Sustainability



Victoria Jacobs,
Department of
Teacher Education &
Higher Education



Esther Leerkes,
School of Health
and Human
Sciences Office of
Research



Jing Deng,
Department of
Computer Science



Promod Pratap,
Department of Physics



Talia Fernós,
Department of
Mathematics &
Statistics



Jerry Walsh,
Department of
Chemistry &
Biochemistry



Edna Tan, Department
of Teacher Education
& Higher Education



Jeff Milroy,
Department of
Public Health
Education



Jeff Patton, Department
of Geography,
Environment, and
Sustainability



Lee Phillips,
Undergraduate
Research, Scholarship,
and Creativity Office

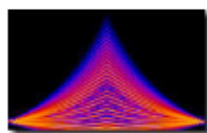


Jared McGuirt,
Department of
Nutrition



Daniel Herr, Department
of Nanoscience

Appendix 1: RISE Speaker Series Flyers and Itineraries



RISE Network
Promoting research and instruction in STEM education

SAVE THE DATE

Dr. Danielle Speller
Postdoctoral Associate
Department of Physics
Yale University

January 27, 2020

Reception: 3:30-4:00 with Cookies and Coffee

Talk: 4:00-5:00pm

Petty Room 136

Free and Open to the Public

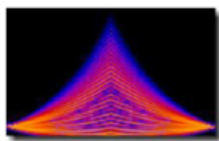
From Darkness to Light: The Search for Axions and other New Physics

The illusive nature of dark matter has puzzled physicists and astronomers for decades. Scientists around the globe are actively searching for the undiscovered, invisible matter that seems to comprise over 85% of the mass density of the observable universe. The most prominent candidates for particle dark matter generally arise from attempts to extend the standard model of particle physics. These attempts often result in predictions of new, stable, massive particles or particle families that barely interact with the type of matter that we see every day.

Axions are an increasingly popular dark matter candidate that originally arose as part of an effort to address the surprising preservation of charge-parity symmetry in some particle physics interactions. The proposed solution predicts a new type of particle that could be produced in large enough numbers to account for the undetected mass in the universe. Recently, the number of experiments searching for axions has increased dramatically and includes a wide variety of techniques. In this talk, we will discuss the search for axions, some of the questions that they address, and the exciting role of new technologies in the search for new physics.



Dr. Danielle H. Speller is a postdoc in experimental physics at Yale University, working at the intersection of astrophysics, particle physics, nuclear physics, and cosmology. After graduating from NC State University as a Park Scholar, she completed her Ph.D. at UC Berkeley under the supervision of Bernard Sadoulet in WIMP dark matter direct detection with the SuperCDMS collaboration. She joined the Maruyama group at Yale as a postdoc in 2017. Her focus is using low-temperature, rare event searches to look for new physics. Her current work includes searching for lepton number violation through neutrinoless double-beta decay with the CUORE experiment and searching for axion dark matter with the HAYSTAC experiment. She is fascinated by the interplay of physics at very small and very large scales and is particularly interested in searches for physics beyond the standard model. She will be joining the faculty of Johns Hopkins University as an Assistant Professor of Physics at the conclusion of her postdoc in the summer of 2020.



RISE Network

Promoting research and instruction in STEM education

Itinerary for Dr. Danielle Speller

Postdoctoral Associate
Department of Physics
Yale University

Sunday, January 26th

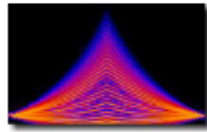
- 2:48pm Arrive on American Airlines (AA4968 from Philadelphia) in Greensboro
- 5:30pm Informal dinner with STAMPS students at Jeff Patton's house (1300 Double Oaks Road, Greensboro, NC)

Monday, January 27th

- 9:15am Pick up from Double Oaks B&B
- 9:30-10:30am Meet with Physics Faculty (Ron Belmont & Joel Shaw)
- 10:30-10:50am Meet with the Physics 291 course
- 11:00-12:00pm Meet with the Society of Physics Students
- 12:00-2:00pm Lunch and meet with the STAMPS and MARC-U STAR students
- 2:00-3:30pm Down time to prep for talk
- 3:30-4:00pm Reception
- 4:00-5:00pm RISE Speaker Series presentation
- 5:45-7:00pm Dinner at Lucky 32

Tuesday, January 28th

- 10:12am Departure flight on American Airlines (AA5242 to DC)



RISE Network

Promoting research and instruction in STEM education

SAVE THE DATE

Dr. Nick Stergiou

Distinguished Community Research Chair and Professor, Department of Biomechanics
Director, Biomechanics Research Building and Center for Research in Human Movement Variability
University of Nebraska at Omaha

February 10, 2020

Reception: 3:30-4:00 with Cookies and Coffee

Talk: 4:00-5:00pm

Room: MHRA 1214

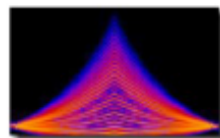
Free and Open to the Public

Talk Title: “Developing a World-class STEM Research and Education Program at a High Research Activity (R2) University”



Dr. Nick Stergiou is the Distinguished Community Research Chair in Biomechanics and Professor, as well as the Director of the Biomechanics Research Building and the Center for Research in Human Movement Variability at the University of Nebraska at Omaha. He is also appointed as the Assistant Dean and Director of the Division of Biomechanics and Research Development. He is the Founding Chair of the first ever academic Department of Biomechanics that graduates students with a BS in Biomechanics. His secondary appointment is as a Professor of the Department of Environmental, Agricultural, and Occupational Health of the College of Public Health at the University of Nebraska Medical Center. His research focuses on understanding variability inherent in human movement and he is an international authority in the study of Nonlinear Dynamics. He has published more than 200 peer-reviewed papers, has been inducted into the National Academy of Kinesiology, and as a Fellow to the American Institute for Medical and Biological Engineering and the

American Society of Biomechanics. Dr. Stergiou's research spans from infant development to older adult fallers, and has impacted the training techniques of surgeons, and the treatment and rehabilitation of pathologies, such as peripheral arterial disease. He has received more \$40 million in funding from NIH, NASA, NSF, the US Department of Education, and many other agencies and foundations. He has received the largest grant in the history of his University, a NIH P20 grant that was worth \$10.1 million. This grant allowed him to develop the Center for Research in Human Movement Variability. Recently, he was able to renew this grant by receiving another \$10.3 million. He also has several inventions and he procured a private donation of \$6 million to build the 23,000 square feet Biomechanics Research Building that opened in August of 2013. This is the first building dedicated to biomechanics research in the world. It is also the first building on his campus exclusively dedicated to research. He recently was able to procure another \$11.6 million in private donations to build a 30,000 square feet expansion to this building which opened in October of 2019.



RISE Network

Promoting research and instruction in STEM education

Itinerary for [Dr. Nick Stergiou](#)

Distinguished Community Research Chair and Professor, Department of Biomechanics
Director, Biomechanics Research Building and Center for Research in Human Movement Variability
University of Nebraska at Omaha

Sunday, February 9th

3:40pm Arrive on American Airlines (AA5522 from Omaha) in **Charlotte**

Monday, February 10th

8:30-9:30am Breakfast at Print Works Bistro (located at Proximity Hotel) with Dr. [Sherine Obare](#) (Dean of the Joint School of Nanoscience and Nanoengineering)

9:30-10:00am Transport to Campus

10:00-10:45am Meet with Drs. [Amy Adamson](#) (Associate Dean of Research, College of Arts and Sciences) and [Malcolm Schug](#) (Head, Department of Biology) in 100A Foust

10:45-11:00am Walk to Kinesiology Conference Room (272 Coleman Building)

11:00-11:45am Down time to check email (272 Coleman Building)

11:45-1:00pm Lunch with Drs. [Louisa Raisbeck](#) (KIN) and [Chris Rhea](#) (KIN) at Jack's

1:00-2:00pm Informal discussion at [Applied Neuromechanics Research Group](#) lab meeting (Anatomy Lab, 347 Coleman)

2:00-3:15pm Down time to prep for RISE lecture (124 Coleman)

3:15-3:30pm Walk to 1214 MHRA Building

3:30-4:00pm Reception with coffee & cookies in 1214 MHRA

4:00-5:00pm [RISE Speaker Series](#) lecture in 1214 MHRA

5:00-5:45pm Transition to dinner at Lucky 32

5:45-7:15pm Dinner – party includes Drs. Chris Rhea, [Tracey Howell](#) (Associate Director of the RISE Network and Senior Academic Professional, Department of Mathematics & Statistics), [Michael Hemphill](#) (Assistant Professor, Department of Kinesiology) and [Joseph Starobin](#) (Associate Professor, Department of Nanoscience)

Tuesday, February 11th

8:00-8:45am Breakfast with Chris Rhea at Proximity

9:15-10:00am Meet with Drs. [Valera Francis](#) (Director, Office of Sponsored Programs), [Rebecca Libera](#) (Assistant Director, Office of Sponsored Programs), [Aubrey Turner](#) (Associate Director of Proposal Development Services) and Ms. [Julie Voorhees](#) (Proposal Development Specialist) in 2714 MHRA

10:15-11:00am Down time to check email (KIN Conference Room)

11:00-11:45am Meet with some of Chris' PhD students (Ruth Stout – 5th year, Chanel LoJacono – 4th year, and Krista Meder – 1st year) in the KIN Conference Room

12:00-1:00pm Meet with Dr. [Kim Littlefield](#) (Associate Vice Chancellor for Research and Engagement)

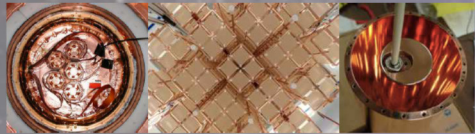
1:00-2:00pm Lunch with Chris and Louisa's PhD students (Mackenzie Pierson – 3rd year, John Palazzolo – 2nd year, Lauren Higgins 2nd year) at Old Town

2:00-3:00pm Wrap up meeting with Chris Rhea

4:50 Departure flight on Delta (DL 857 to ATL)

Pictures from Dr. Speller and Dr. Stergiou's talks

FROM DARKNESS TO LIGHT: THE SEARCH FOR AXIONS AND OTHER NEW PHYSICS



Danielle H. Speller
Yale University
The University of North Carolina at Greensboro
January 27, 2020

Yale Wright Laboratory

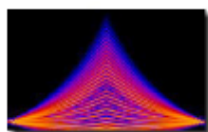
Yale

U | BIOMECHANICS

Developing a World-Class STEM Research and Education Program at High Research Activity (R2) University

By
Dr. Nick Stergiou





RISE Network

Promoting research and instruction in STEM education

SAVE THE DATE

Dr. Jerrod Henderson
Instructional Associate Professor
Cullen College of Engineering
University of Houston

March 19, 2020

Reception: 3:30-4:00 with Cookies and Coffee

Talk: 4:00-5:00pm

Room: SOEB 226

Free and Open to the Public

**Talk Title: Repairers of the Breach: A Conversation
about the 'Leaky STEM Pipeline'**



Dr. Henderson is currently an Instructional Associate Professor in the Cullen College of Engineering at the University of Houston after being a chemical engineering faculty member at the University of Illinois for six years. He has dedicated his career to increasing the number of students who are in the pipeline to pursue STEM careers. He believes that exposing students to STEM early will have a lasting impact on their lives and academic pursuits. He is a co-founder of the National Science Foundation, funded by the St. Elmo Brady STEM Academy (SEBA). SEBA is an educational intervention aimed at exposing underrepresented 4th and 5th-grade boys to hands-on, inquiry-based STEM activities. SEBA accomplishes its goals through an innovative educational curriculum and by engaging students' fathers and/or male mentors who learn STEM alongside them. He has been recognized by community organizations, the University of Illinois as a recipient of the Chancellor's Award for Excellence in Public Engagement, and most recently by INSIGHT Into Diversity Magazine as an Inspiring STEM Leader Award recipient and the North Carolina School of Science and Mathematics with the Chancellor's Award for Exemplary Service. He was recently appointed by the Dean of the College as the Director of the Program for Mastery in Engineering Studies (PROMES), a program aimed at increasing engineering student achievement, engagement, and graduation rates. His research interests are in engineering identity formation and persistence among underrepresented students, especially African American males.


Appendix 2: NIH Loan Repayment Program Workshop



National Institutes of Health Loan Repayment Program (NIH LRP) Workshop

Christopher K. Rhea, PhD
Department of Kinesiology
Director, Research and Instruction in STEM Education (RISE) Network

1



Student Loan Forgiveness Programs

- [Public Service Loan Forgiveness \(PSLF\) program](#)
 - [Why this program is challenging](#)
- [North Carolina student loan forgiveness programs](#)
- [NIH LRP](#)

2



NIH LRP

- Eligibility

- Must hold a doctorate
- At least 20 hr/week on research (50% of workload)
- Educational debt equal to or in excess of 20 percent of your institutional base salary at the time of award
- Work at a non-profit (universities count, corporations do not)

3



NIH LRP

- Repayment logistics

- Up to \$50,000/yr for up to 2 years, just increased from \$35,000/yr
 - Paid quarterly directly to your loan servicer
 - They also pay the taxes associated with this award in your name to the IRS
 - But not your state taxes!
- Can be renewed
- Amount is based on your debt-to-income ratio

4



NIH LRP

- Repayment logistics
 - See [Repayment Calculator](#) to estimate the amount of your award
- Personal story
 - Graduated with \$170,000 in student loan debt
 - Initial NIH LRP awarded for 2015-2017 (\$35,000/year)
 - Renewal awarded for 2017-2019 (\$35,000/year)
 - 2nd renewal awarded for 2019-2021 (\$22,103/year)
 - Student loan debt reduced to ~\$18,000 by the end of 2021

5



NIH LRP

- Programs supported by the LRP
 - [Extramural](#)
 - Clinical, Pediatrics, Health Disparities ([recently expanded](#)), Contraception & Infertility, Clinical Research for Individuals from Disadvantaged Backgrounds
 - [Intramural](#) (only if you work for NIH)
 - AIDS, Clinical, General, General ACGME

6



Find your way here

NIH LRP

- Application window
 - Only one deadline (as opposed to the standard 3 NIH due dates)
 - Extramural New and Renewal Awards
 - November 15th traditionally
 - Intramural New and Renewal Awards
 - March 15th traditionally
 - You can apply as many years in a row as needed, it took me 5 years to get funded!
 - No Summary Statement provided after the review

7



Find your way here

NIH LRP

- Application types
 - Independent Researcher (i.e., faculty)
 - Mentored Researcher (i.e., postdoc)

8



Find your way here

NIH LRP

- Elements of the application
 - Research Activities (8 pages)
 - Career Development Plan (2 pages)
 - Research Environment (1 page)
 - Personal Statement (1 page)
 - NIH Biosketch (5 pages)
 - 3-5 letters of recommendation
- Research Accomplishments (2 pages, only for renewals)
- Training and Mentoring Plan (2 pages, Mentored Researchers only)

9



Find your way here

Feel free to contact me with any follow-up questions

Christopher K. Rhea, PhD
Department of Kinesiology
ckrhea@uncg.edu

10

Appendix 3: Science Everywhere Flyers and Challenge Grant Proposal

Flyer distributed to the public in English



UNCG  **#UNCGscifest**
SCIENCE
Everywhere

CELEBRATE SCIENCE

SATURDAY, APRIL 25
12-4 P.M.
UNCG CAMPUS
scienceeverywhere.uncg.edu

FREE AND OPEN TO ALL AGES

Become a scientist for the day as you create your own DNA necklace, measure the iron in a Cheerio, program a robot, pet a reptile and much more!

- Engage with more than 70 hands-on science activities
- Take home prizes, projects, T-shirts and other items
- Enjoy food from local food trucks or on-campus dining

Free parking in all parking decks.
Science Everywhere is a North Carolina Science Festival event.



UNC GREENSBORO
Find your way here



Flyer distributed to the public in Spanish

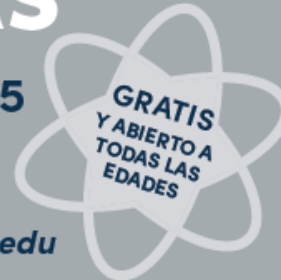


CELEBRA LAS CIENCIAS

SÁBADO, ABRIL 25
12-4 P.M.

UNCG CAMPUS

scienceeverywhere.uncg.edu



¡Conviértete en un científico por el día mientras creas tu propio collar de ADN, mides el hierro en un Cheerio, programas un robot, acaricias un reptil, y mucho más!

- Participa en más de 70 manualidades científicas
- Llévate a casa premios, proyectos, camisetas, y otras cosas
- Disfruta comida de camiones de comida locales o en el comedor del campus

Estacionamiento gratis en todos los parqueaderos cubiertos.

Science Everywhere es un festival de ciencias en Carolina del Norte.



UNC GREENSBORO

Find your way here



Flyer distributed to the UNCG community requesting their participation



UNCG 
Science
Everywhere

APRIL 25, 2020

 **SCIENCEEVERYWHERE.UNCG.EDU** 
#UNCGSCIFEST

Sign up for an Activity

All Disciplines are welcome to participate

create a nature collage or DNA necklaces, identify different musical tones, touch a fossil, and more!

SIGN UP: [HTTPS://FORMS.GLE/P4YR1PR1P2VAIVSK9](https://forms.gle/p4YR1PR1P2VAIVSK9)

Deadline: February 7th, 2020

**Challenge Grant submitted the NC Science Festival / UNC System to partially support the
UNCG Science Festival**

Application for UNC System Challenge Grant for the North Carolina Science Festival

Applicant: Christopher K. Rhea, UNCG on behalf UNCG and the RISE Network

Event: UNC Greensboro's Science Everywhere event on the main campus and at the Moss Street Partnership Elementary School

Amount Requested: \$2,500 and \$2,500 in match funds

Organizer's Statement (250 word max):

UNCG's 2020 proposal maintains our expansive footprint that includes our signature Science Everywhere event on UNCG's campus, as well as a lead-in event at the Moss Street Partnership Elementary School (MSPS). The MSPS is operated by UNCG in partnership with Rockingham County Schools in Reidsville, NC. All activities are free and open to the public. The event at MSPS is on Thursday, April 23rd and it will lead into the Science Everywhere event on UNCG's main campus on Saturday, April 25th.

The 2020 theme of "The Future" will be incorporated in two ways. First, "The Future" can be defined as future leaders and professionals of STEM. Our main campus and MSPS events cater primarily to K-12 students, with the intention of inspiring these students to appreciate STEM in our everyday life and potentially consider STEM careers. Engagement at an early age is a key pathway in the development of a STEM workforce pipeline. Second, "The Future" can be defined as the future of STEM. What better way to show the future STEM by including futuristic demonstrations, such as using virtual reality for medicine or how to grow plants in outer space.

At UNCG's 6th annual Science Everywhere event, families engage in new and interesting scientific ideas, have access to labs and will interact with science experts in many fields. The science activities are coordinated by UNCG's Research and Instruction in STEM Education (RISE) Network—a coalition of STEM educators and researchers, faculty, and students.

Event Proposal (500 word max):

Our two-event schedule will kick off with a lead-in event at the Moss Street Partnership School from 5:00 to 7:00 p.m. on Thursday, April 23, 2020. The Partnership School event will be an extension of UNCG's Science Everywhere, bringing engaging STEM activities to the K-5 elementary school and broader Reidsville, NC community. To provide an integrated learning experience, during the week of the event, students will engage in a unit of study aligned with the 2020 NC Science Festival theme that provides an interdisciplinary exploration of various STEM topics of interest. Students will showcase their STEM projects in a school-wide Expo during the MSPS Science Everywhere event. Additionally, we will host more than a dozen STEM activities provided by Duke Energy Science Kits and those developed by our teachers in collaboration with UNCG faculty and staff (e.g. coding, making, 3-D printing). Other partners include Reidsville High School (MSPS feeder school) students who will provide demonstrations and STEM activities for the elementary students. Local businesses and community members will be invited to participate in the Expo.

Our signature event will be the Science Everywhere event hosted on UNCG's main campus on Saturday, April 25th. The 6th annual Science Everywhere event will provide STEM activities to all who wants to discover new ideas and unlock their imagination. It poured rain all day last year during our event and we still have over 3000 attendees. In previous years, we had nearly 5000 attendees; a number we expect to hit with nicer weather this year. All activities will connect experts to the public through hands-on science activities, promote career awareness in STEM, and engage a diverse community of learners. Activities will highlight "The Future" where applicable. STEM Alumni who are involved in

educating future STEM professionals or who are doing futuristic work will be invited to offer activities and participate as volunteers. We will also again welcome scientists who are a part of the IMPACTS program, which trains scientists how to communicate to the public and then creates opportunities for them to practice and hone their skills in science communication. We are happy that Science Everywhere can provide an opportunity for the IMPACTS scientists to engage with the public. All visitors will walk away with a bag of takeaways to remind them of the STEM knowledge they gained and their experience on a university campus. Our intention is to infuse young people with a sense of the exciting and interesting applications of STEM, encouraging them to open their imagination to pursuing education and/or a career related to STEM.

Our events address all four of the major points for the Festival Program and engage multiple partners and diverse community audiences while expanding the Festival's overall footprint. This is an outstanding opportunity for faculty and graduate students to practice communication skills by teaching what they do to people of all ages. This is a highly collaborative event! All marketing will acknowledge the NC Science Festival.

Innovation (250 word max):

For the first time, our event will utilize UNCG's mobile app. The app is free to the public and currently hosts university-related information. A special section of the app will be built for Science Everywhere that will host event information and station descriptions/locations. This is an innovate way for our attendees to interact with our event, which affords us the opportunity to provide more digital information to attendees about particular STEM stations if they choose. We will take our app for a test drive this year for this event and continue to refine the app/event experience in future years. We will also have the app developers run a station at the event so students can learn how STEM helps create apps, which is a nearly everyday interaction touchpoint for most students and parents these days.

Science Everywhere will partner with the Office of Alumni Engagement to attract alums who work in futuristic STEM areas to demonstrate the science behind these activities. Moreover, many of our UNCG scientists work in futuristic STEM areas and we will recruit them to have hands-on activities at the event, including using virtual reality for medicine and how to grow plants in outer space. All hands-on activities will create the opportunity for learners to understand that we all use science every day.

Expenditure of Funds (250 word max):

Both events are free of charge and open to the public. We anticipate more than 5000 community participants at Science Everywhere on UNCG's main campus. MSPS will involve the entire elementary school (395 students), high school students, family members and the community. We are targeting 525 attendees at MSPS.

Funds are requested to support:

- | | |
|---|----------------|
| • Partial support for supplies for activities at Science Everywhere | \$600 |
| • Partial support for t-shirts for volunteers at Science Everywhere | \$600 |
| • Honoraria for two herpetologists | \$800 |
| • Supplies, marketing, and consumables for "The Future" activities for MSPS | <u>\$500</u> |
| Total request | \$2,500 |

All funds requested directly support the events. The honoraria are based upon the amount we paid last year to support these live animal presentations.

University match is provided by the Provost's Office and will support the rental of university space, marketing, security for the day, media, tents, tables, and chairs totaling over \$10,000. Last year's Science Everywhere event cost approximately \$35,000 and we expect similar expenditures this year, which does not include personnel.

All UNCG faculty, student, and staff time at the two events is in-kind support. We had over 300 volunteers last year—inclusive of STEM professionals, faculty, graduate students, undergraduate students, and members of the Greensboro and greater Triad area—and we offered over 100 activities throughout campus. We continue to add faculty and students and to date, everyone asked has said YES.

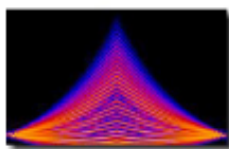
Branding Plan (250 word max):

UNCG's office of University Communications will handle the majority of the co-branding for our events. Additionally, UNCG Enrollment Management, College of Arts and Sciences, School of Health and Human Sciences, and School of Education, and MSPS are all marketing the event. UNCG Science Everywhere developed its logo during our first Science Everywhere festival five years ago. This logo now has name recognition in the community.

All advertising for all the events will use both the NC Science Festival logo and the Science Everywhere logo. Scientists from the IMPACT program will also help promote our event. Our branding plan includes flyers, t-shirts (volunteers and participants), tote bags, social media, billboards, web materials, and any other media used to promote events to the community. This is truly a collaborative UNCG event!



Appendix 4: RISE Small Grant Call for Proposals



RISE Network
Promoting research and instruction in STEM education

RISE (Research and Instruction in STEM Education) Small Grant Program

The RISE small grant program is designed to support any aspect of research that involves STEM education in any discipline at UNCG. The grant will fund innovative research that advances the RISE vision of promoting research and/or instruction in STEM education at UNCG. It is expected that these seed funds for research projects will lead to the development of external grant proposals

The RISE Small Grant Program includes:

- One Individual grant up to \$5000 to be expended in the 2019-2020 Fiscal Budget year ending June 30, 2020 (or smaller grants totaling \$5000)

Funds may be used for:

- Any research project that includes a component of STEM education or outreach
- Supplies or small equipment items for STEM-related research
- Travel to research conferences in STEM fields for faculty or students
- Stipend for faculty or students to conduct STEM-related research

Requirements: 1 page (maximum) non-technical proposal with budget that includes:

- Title
- Name and position at UNCG
- Description of proposed STEM education detailing the purpose of the project and activities
- Expected Results
- Proposed budget including personnel
- Statement about how the proposed research will translate into future external funding
- Need to present to the RISE Board in Fall 2020

The proposal should be submitted as a single .pdf to Nabeela Farhat at rise@uncg.edu. Format: 11-point font, 1 inch margins.

Final report on grant-funded accomplishments or work-in-progress due by September Board Meeting (TBA)

Proposal Deadline is November 27th, 2019 at 5pm and the award will be announced by December 13th, 2019. Questions may be addressed to RISE Director Christopher Rhea (ckrhea@uncg.edu). Proposals should be submitted through the [InfoReady](#) system.

Appendix 5: RISE Small Grant 2019-2020 Winning Proposal

Maia Popova, Assistant Professor, Department of Chemistry & Biochemistry

Chemistry Instructors' Beliefs and Practices Toward Developing Student Representational Competence

Proposed Project: Learning and communicating with representations is an essential component of chemistry instruction.¹⁻⁵ The process of successfully using multiple representations in order to think about, communicate, and create meaning for a phenomenon defines representational competence (RC).² Although a wide body of literature has focused on exploring chemistry students' RC skills,⁶⁻¹⁰ no studies have examined chemistry instructors' practices toward developing student RC. The goal of this study is to fill this gap by pursuing the following *objectives*: a) to explore chemistry instructors' pedagogical content knowledge (PCK)¹² and beliefs¹³ toward developing student RC (*Study 1.1*), b) to investigate what strategies instructors use to develop and access RC in their courses (*Study 1.2*), and c) to identify the alignment between instructors' beliefs and practices (*triangulation of data from Study 1.1 and Study 1.2*).

Study 1.1: Interviews with Organic Chemistry Instructors. My graduate student will collect course artifacts and video observations of classroom practices of chemistry faculty ($N = 10$ to 15 from UNCG and other institutions in the US). Semi-structured, think-aloud interviews will be then conducted by me with these instructors. The interviews will consist of two phases: 1) questions to ascertain instructors' PCK and beliefs about developing RC in their classrooms and 2) presenting instructors with specific representations (such as dash-wedge models and Newman projections) to ask them to discuss conceptual difficulties they perceive students developing when learning about these representations, as well as what strategies they see as most effective to assist students in their ability to interpret and use these representations when discussing concepts and solving problems. The collected data will be inductively coded and examined for patterns in instructors' thinking using constant comparative analysis.¹⁴

Study 1.2: Analysis of Classroom Artifacts. The findings from *Study 1.1*, in conjunction with literature on best practices for developing RC in chemistry classrooms,^{2,4,11,15,16} will provide a framework for the development of a coding rubric to analyze video observations and course artifacts (syllabi, lecture notes, homework, quizzes, and exams). Analyses of video observations and classroom artifacts will allow us to understand how instructors teach students to interpret representations, whether they engage students to use and/or construct representations when explaining concepts or solving problems, and how they assess student development of RC. Subsequent triangulation¹⁷ of *Study 1.2* findings with findings from *Study 1.1* will allow for the analysis of alignment between instructors' beliefs and practices and will ensure the trustworthiness¹⁸ of the conclusions.

Expected Results/Future Funding: Knowledge of instructors' thinking and practices when teaching with visualizations will inform the development of effective instructional practices to assist students in developing their RC. It will also provide valuable insight into the current views of representational competence in chemistry curriculum in order to inform future professional development and research. In addition, the results of this study will serve as a pilot data for seeking future funding from the NSF Improving Undergraduate STEM Education: Education and Human Resources (IUSE: EHR) program. The IUSE: EHR supports "projects that have the potential to improve student learning in STEM through development of new curricular materials and methods of instruction."

Proposed Budget:

Travel to national conferences to recruit faculty participants and disseminate findings

Graduate Student	\$1,400/person/conference	\$1,400
Primary Investigator	\$1,400/person/conference	\$1,400

Technology to collect data

5 video cameras and tripods	\$300/unit	\$1,500
5 lapel microphones	\$68/unit	\$340
3 digital audio recorders	\$120/unit	\$360

Total \$5,000

Appendix 6: Units Integrated within RISE's Efforts

Alumni Association
College of Arts and Sciences Office of Research
Department of Anthropology
Department of Biology
Department of Chemistry & Biochemistry
Department of Computer Science
Department of Educational Research Methodology
Department of Geography, Environment, and Sustainability
Department of Kinesiology
Department of Mathematics & Statistics
Department of Nanoscience
Department of Nutrition
Department of Peace & Conflict Studies
Department of Physics and Astronomy
Department of Public Health Education
Department of Teacher Education and Higher Education
Division of Student Success
Event Planning
Joint School of Nanoscience & Nanoengineering
Moss Street Partnership School
Office of Admissions
Office of Intercultural Engagement
Office of the Provost
Office of Research and Engagement
Office of Research Integrity
Office of Sponsored Programs
School of Education Office of Research
School of Health and Human Sciences Office of Research
Teaching Resources Center/SELF Design Studio
Undergraduate Research, Scholarship and Creativity Office
University Advancement
University Communications