

Transforming COS...Transforming RIT



learning assistants



cross-campus STEM education research



research on learning



small group discussions on inclusiveness



international collaborations of researchers



college-wide discussions on equity

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The Center's Mission is to:

improve science and math education and outreach initiatives at RIT and foster collaboration between science and math educators and education researchers.

The Center's Vision is to:

- foster and grow a community engaged in rigorous, discipline-based STEM education research, providing infrastructure and opportunities for interdisciplinary communication and collaboration.
- support scholarship of pedagogy and teaching & learning, including transformational STEM educational practices.
- broaden participation in STEM through outreach, research and programmatic innovations.

RESEARCH INITIATIVES

Science & Mathematics Education Research Collaborative (SMERC)

Dr. Dina Newman (Director)

SMERC consists of a multidisciplinary group of Discipline Based Education Researchers (DBER), who study how students learn the STEM disciplines, apply science to problem solving, and become enculturated as scientists. This research advances fundamental knowledge of how people learn, and develops general theory that can be applied in practice. Individual projects include biology education, physics education, chemistry education, engineering education, and science/math communication. SMERC is the overarching team of researchers leading the following areas of research:

I. Photonics and Optics Workforce Education Research (POWER)

Drs. Ben Zwickl and Kelly Norris-Martin

POWER is a project led by Dr. Ben Zwickl. POWER unites higher education, discipline-based education research, and workforce development in order to investigate core aspects of typical undergraduate STEM programs: scientific content, mathematics, and communication. This project is funded through a National Science Foundation Education & Human Resources Core Research (ECR) grant DGE-1432578. In the Photonics Careers Project, the early careers of technicians, engineers, and researchers are being studied to better understand the transition from school to jobs. With perspectives drawn from employees and managers, PhD students and their supervisors, researchers are identifying key math, physics, technical and communication skills that are essential for success. This foundational research supports stronger bridges between school and work and between the industry advocates for workforce development and the academic communities focused on education research. The Photonics Careers Project will provide additional research-based clarity that informs national discussion and policy around STEM workforce preparation.

II. Molecular Biology Education Group (MBER)

Drs. Dina Newman and Kate Wright

MBER is a collaborative research lab co-led by Dr. Dina Newman and Dr. Kate Wright, faculty in the Gosnell School of Life Sciences at RIT. The team studies how students think about molecular biology concepts and develops tools for improving biology education. Areas of Interest include:

1. **Student mental models of molecular processes that involve DNA, and how novices differ from experts.** Much work has focused on student understanding of meiosis, which led to the development of a new framework, The DNA Triangle.
2. **How visual representations of molecular processes impact student understanding.** Prior work focused on the use of arrow symbols by experts and the interpretation of these symbols by learners. Current projects are examining how DNA is represented, on a continuum from the very concrete to the very abstract.

3. **How physical models can be used to improve student learning about molecular processes.** This work is done in collaboration with the Center for Biomolecular Modeling at the Milwaukee School of Engineering, where many 3-D models have been developed. These models provide the basis for activities that promote deep conceptual learning of processes that are not easy to observe directly.
4. **Development of assessments and activities for undergraduate instructors teaching molecular biology concepts.** Numerous activities have been developed based on research into student thinking of biology, many of which demonstrably improve learning for undergraduates at all levels. Research-based assessments are also developed to assess conceptual understanding.
5. **Interactive video vignettes for teaching key ideas that are difficult for students.** A suite of interactive, web-based activities have been developed to introduce or clarify key concepts and big ideas in biology. This project is funded by NSF (DUE-1432286, DUE-1432303) and involves a collaboration with Dr. Robert Teese (School of Physics and Astronomy at RIT) and Dr. Jean Cardinale (Alfred University).

III. Research Experience for Undergraduates (REU)

Dr. Dina Newman and Dr. Kate Wright

DBER REU is a program that brings students from all over the U.S. to learn about DBER and undertake cutting edge projects in the field (<https://www.rit.edu/science/smerc/reu>). SMERC members Kate Wright (PI) and Dina Newman (Co-PI) are leading the second iteration of the NSF funded REU program: **Research Experiences for Undergraduates in Model-based Reasoning in STEM Education at the Rochester Institute of Technology** (DUE 1757477). Spring/Summer 2019 the program enrolled 9 students from around the country:

- Carmen Carusone (The College of New Jersey)
- Aeowynn Coakley (San Jose State University)
- Paulina Cortez (San Diego State University)
- Grace Heath (Loyola University of New Orleans)
- Aimee Hernandez (University of Texas, El Paso)
- Ronald Quintero (Florida International University)
- Rebecca Ross (North Carolina State University)
- Kelli Shar (University of Tampa)
- Krystina Williamson (Barnard College)

IV. Graduate Admission and Retention Research

Dr. Casey Miller

The project focuses on holistic practices to increase diversity and retention in physics graduate programs. The team has studied current admission and retention across the United States, and offered targeted interventions and tools that aid programs in using more holistic measures. The goal of this project is to increase access to, and retention of, women and excluded identity groups in graduate physics programs.

1. Holistic Practice for Faculty. Short paper-based modules have been created to train groups of faculty on various holistic practices including the legal landscape of admissions, how to use GRE-scores, how to create a rubric for evaluation, how to identify non-cognitive qualities in graduate application and induction practices.
2. Non-Cognitive Assessment. Pilot testing is in progress to establish validity and reliability of this new instrument.
3. Interviews with faculty and students. The goal of these interviews is to determine faculty and student attitudes towards a variety of recruitment, admissions, and retention practices.
4. Presence of Homophily Within and Across Physics Departments. Comparisons of the educational backgrounds of physics faculty at academic departments shows a disproportional representation of faculty from elite institutions, particularly at the top ranked institutions themselves. This project is funded by NSF (NRT 1633275).

V. Franklin Physics Education Research Lab

Dr. Scott V. Franklin

Dr. Scott Franklin supervises a variety of physics education research projects. Past and current projects include characterizing how physicists embed conceptual meaning in mathematical formalism, visualizing the different routes students take to graduation (academic field switching), studying the interaction of student identities with the physics culture, and developing and characterizing effective mechanisms for bringing about faculty and institutional transformation. [Read More](#)

VI. Inclusive Excellence Research

Dr. Dina Newman, Dr. Scott V. Franklin

Under the HHMI Inclusive Excellence Initiative, research is being conducted on the motivation of faculty to participate in inclusion efforts, the incorporation of inclusive practices both in the classroom and in the lab, and on faculty's perceptions and actual implementation of inclusive practices in the classroom. [Read More](#). Two post-doctoral fellows are employed by the grant:

- Rita Margarida Almeida Quiñones de Magalhães
- Brittney Wyatt

RESEARCH ACTIVITIES

I. Interdisciplinary STEM Education Research Forum (ISERF)

<https://www.rit.edu/castle/interdisciplinary-stem-ed-research-forum>

In February of 2018, CASTLE, along with College of Engineering Technology formed an interdisciplinary collaboration forum. Under the direction of CASTLE faculty Dr. Dina Newman and Ben Zwickl, STEM education research groups across campus meet to present, share ideas, and further common research goals. Within little more than a year, this campus-wide scholarship community has grown focusing on removing silos of those researching STEM education scholarship. It has connected education research faculty, forming new partnerships, and encouraged working together on research themes and interests. In the 2018-19 academic year, associations grew to include:

- Golisano College of Computing & Information Sciences
- Kate Gleason College of Engineering
- College of Engineering Technology
- College of Health Sciences and Technology
- College of Liberal Arts
- National Technical Institute of the Deaf
- College of Science
- School of Individualized Study

2018-19 Forum Topics:

- Student Groups & Informal Learning Spaces
- Sharing Research Funding Ideas
- Sharing STEM Ed Research
- Focus on Computing

II. SMERC Journal Club

<https://www.rit.edu/castle/research/journal-club>

The RIT Science and Mathematics Education Research Collaborative (SMERC) runs a weekly journal club open to all, consulting with faculty interested in incorporating research-based methods and assessment into their classrooms. Twenty-two sessions were held in the AY2018. Run by Dr. Ben Zwickl, readings were selected by suggestion from a variety of publications led by rotating participant facilitation. Participants collaborated with the College of Engineering Technology (CET) who also holds a biweekly Journal Club on STEM Education Research.

III. Seminar Speaker Series

<https://www.rit.edu/castle/research/seminar-speaker-series>

This past year research faculty invited six guest seminar speakers from alternate colleges and universities to present to interested faculty, staff and students. Topics included research analysis, active learning, teaching practices, and cultural identity, to name a few. All were welcome to attend the seminars and workshops.

2018-19 Seminar Speakers

Jennifer Yates, University of South Alabama, September 5, 2018, 1pm-1:50pm
“Strategies for an Inclusive Classroom.”

Heather Lewandowski, University of Colorado-Boulder, November 14, 2018, 1pm – 1:50pm
“Engaging Students in Authentic Scientific Practices in Physics Lab Courses.”

Martin Stein, Cornell University, January 22, 2019, 3:30-4:30 pm
“Measuring critical thinking during physics labs.”

Jason Wiles, Syracuse University, February 20, 2019, 1pm-1:50pm
“Explorations in Evolution Education and Equity and Inclusion in STEM.”

Michelle Smith, Cornell University, March 22, 2019, 1pm – 1:50pm
“A Data-Driven Approach to Helping STEM Undergraduate Students During Key Transitions.”

Mary Brydon-Miller, University of Louisville, May 1, 2019, 1pm – 1:50pm
“Community-based Research: Mobilizing Research for Social Change.”

Mary Brydon-Miller, University of Louisville, May 1, 2019, 2pm – 3pm
“The Methodology Candy Store: Finding New Research Approaches for Practitioner Inquiry.”

Rebecca Lindell, Tiliadal STEM Education Solutions, June 5, 2019, 2pm – 3pm
“Solving the Gender Fairness Issue on the Force Concept Inventory: Understanding the Roles of Validity, Reliability and Fairness.”

FLAGSHIP PROGRAMS

INCLUSIVE EXCELLENCE INITIATIVE

RESEARCH · COMMUNITY · CLASSROOM



Inclusive Excellence 5-Year Project Funded by a \$1M grant from Howard Hughes Medical Institute

The Inclusive Excellence 5-Year Project began in 2017 and has now completed two years of working toward a more inclusive environment across the College of Science. The program has directly involved 59 faculty, staff, and students in one or more cohorts in one of the three areas of focus: **Research, Classroom Practice, or Community**. Seventy additional faculty have attended at least one Inclusive Excellence event, ranging from reading groups and panel discussions, to award-winning films and internationally acclaimed speakers.

The initiative continues to work toward embracing perspectives, strengths and insights from individuals of varied backgrounds, lifestyles, economic statuses, nationalities and gender identifications. Year two engaged individuals from all Academic Units within the College of Science, building on the foundation begun by those in the natural sciences.

Campus-wide awareness of the efforts to create a more inclusive and welcoming environment for all students has increased through partnerships. Campus-wide and community events collaborating with the Office for Diversity and Inclusion's Division of Diversity and Inclusion brought internationally acclaimed Jane Elliott to campus with a filled auditorium. With the aid of RIT Marketing Communication, several spotlights and feature stories have extended campus-wide and city-wide via television and print outlets.

Intersections, RIT podcasts was suggested to RIT University Communications, highlighting conversations between STEM faculty mentors and student mentees in the Inclusive Excellence program. It was so well accepted, that it is now used campus-wide where podcasts appear on the RIT website for all to experience.

Year three plans continue to address the many ways of creating an inclusive and welcoming environment for students in the STEM fields. Strategies are in place to:

- recruit new faculty to participate in classroom practice and research mentoring cohort experiences
- continue Diversity Theater workshops with actors improvisational enacting of participants' personal stories.
- match and support additional pairs of faculty mentors and student mentees from a variety of underrepresented groups.
- embed faculty liaisons within academic units to reach more faculty and integrate the program's ideals into the departments
- increase support from the Institute's president and provost.
- track changes in perceived climate through faculty and staff surveys
- provide new engaging speakers, discussions, and other opportunities for the community to become educated about inclusivity issues
- partner with the Division for Diversity and Inclusion to develop a more supportive environment for students

This program is supported in part by a grant to RIT from the Howard Hughes Medical Institute through the Science Education Program.

[Read More](#)

[Watch the Video](#)

Learning Assistant (LA) Program

Dedicated to the transformation of STEM courses – the LA Program creates environments in which students can interact with one another, engage in collaborative problem solving and articulate and defend their ideas. Undergraduate LAs facilitate small-group or other interactions in the classroom. RIT's model is designed to: a) provide resources to help faculty implement pedagogical change in their classrooms, b) recruit and prepare talented STEM majors for teaching careers, c) engage faculty and departments in recruitment and preparation of future teachers and d) improve the quality of STEM education for all undergraduates.

During the Fall 2019 semester the program had 42 Learning Assistants working with 20 Faculty Mentors in four College of Science departments (Biological Sciences, Chemistry, Mathematics/Statistics and Physics) and two College of Engineering Technology departments (Manufacturing & Mechanical Engineering Technology, Electrical Engineering Technology). The American Sign Language and Interpreting Education department within NTID (National Institute for the Deaf) continued in 2018-19.

For the Spring semester there were 36 Learning Assistants working with 27 Faculty mentors within the same departments. Four Learning Assistants were placed in interpreting courses

mentored by NTID faculty (Interpreting II, Sign, Mime & Visual Theater, Intro. to Performing Arts and Women and the Deaf Community).

Two recruitment fairs were held (fall and spring semesters) to educate students on the Learning Assistant Program and provide them an opportunity to speak with past and current LAs about their experiences. The LA Program also hosted a teacher roundtable, bringing teachers from local schools on campus to speak with students interested in the teaching career path.

Summer Math Applications in Science with Hands-On (SMASH) Experience for Girls

The SMASH Experience for Girls is a summer program designed to increase middle-school girls' engagement and interest in STEM. In the summer of 2018 this unique program brought 39 rising eighth grade girls to RIT's campus from 13 different schools. Forty-nine percent of the participants were awarded need-based scholarships, the first year to come this close to the 50% goal. Participants spent a week working on mathematical modeling projects, designed to show the usefulness of mathematics in everyday life; self-affirmation activities created to build confidence in math; and daily recreational activities. This year the participants were hired by the Center for Disease Control and Prevention to look at an outbreak of bacteria contaminating our food. They were to develop a strategy to neutralize it.

The experience concluded with a hands-on event involving representatives from local companies demonstrating the role of STEM in their industries, and a parent symposium where participants present a problem plaguing their local community and how mathematics could be used to solve this problem. In preparation for the summer experience, RIT undergraduate and graduate students, with interests in K-12 STEM education, under the mentorship of a local teacher create, test, and then facilitate all SMASH activities.

Professional-development for Emerging Education Researchers (PEER)

This discipline-based education research program holds the promise of satisfying expectations of both scholarship, which is increasing at teaching-centric institutions, and teaching effectiveness, a concern at all institutions. Additionally, junior education researchers seek more diverse training in research methods and theories. Emerging education researchers need support as they develop their research programs and expand their theoretical and methodological expertise, and they benefit from the guidance of knowledgeable peers and near-peers.

In 2018-19 the PEER program expanded its international presence and now has a location in Vancouver, British Columbia, bringing the program now to five countries. This past year alone PEER held workshops in Rwanda, Cologne and Vancouver, and will, again hold a summer program at RIT. Participants include junior faculty, postdoctoral researchers and graduate students beginning their careers, as well as senior faculty looking to transition from traditional disciplinary research into STEM education research.

PEER-Rochester available projects include looking at the following questions:

- How do students collaborate within and among lab groups, and how does the nature of that collaboration change over the course of the summer experience? Network analysis is used to track collaboration within and among lab groups of 3-4 students.

- How do gender and ethnicity affect conversational equity in lab groups? Work is done in developing both quantitative and qualitative measures of equity, and comparing the measures among multiple groups.
- When former IMPRESS students return as learning assistants, how do their experiences in the program shape their interactions with students later on? The focus is on how learning assistant interactions with IMPRESS students change (or remain the same) as they move from participants to instructors.
- How does participation in the program affect student views of the nature of science and the role of experimentation? When students conduct experiments, researchers learn about ideas around what makes an experiment "good," and how table-top experiments are related to scientific practices.

PEER World Locations

Rochester, NY, USA

Cologne, Germany

Kibungo, Rwanda

Monterrey, Mexico

Vancouver, BC

CASTLE CORE MEMBERS – Managing CASTLE Programs & Projects



Scott Franklin
Director, CASTLE and
Professor, School of
Physics and Astronomy



Dina Newman
Director, SMERC and
Associate Professor, Thomas H.
Gosnell School of Life Sciences



**Rita Margarita Almeida
Magalhães**
Postdoctoral Researcher
RIT Inclusive Excellence
Center for Advancing STEM
Teaching, Learning & Evaluation



Jennifer Bailey
Senior Lecturer,
Kate Gleason College
of Engineering



Lindsay Owens
Postdoctoral Researcher
School of Chemistry and
Material Sciences



Kelly Norris Martin
Assistant Professor, School of
Communication



Susan Rothwell
Postdoctoral Researcher,
School of Physics and
Astronomy



Leslie Kate Wright
Associate Professor, Thomas H.
Gosnell School of Life Sciences

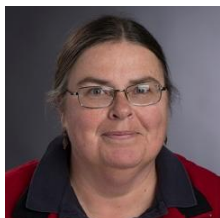


Brittney Wyatt
Postdoctoral Researcher
RIT Inclusive Excellence
Center for Advancing STEM
Teaching, Learning &
Evaluation



Benjamin Zwickl
Assistant Professor, School of
Physics and Astronomy

CASTLE AFFILIATED PERSONNEL – Contributing to CASTLE Programs & Projects



Linda Barton

Associate Professor, School of Physics and Astronomy



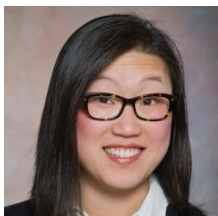
Kara Maki

Associate Professor
School of Mathematical Sciences



Elizabeth Cherry

Associate Professor, School of Mathematical Sciences



Lea Vacca Michel

Associate Professor, School of Chemistry & Materials Science



Jeremy Cody

Associate Professor, School of Chemistry & Materials Science



Casey Miller

Associate Dean for Industrial Partnerships and
Associate Professor, School of Chemistry & Material Sciences



Paul Craig

School Head and
Professor, School of Chemistry & Materials Science



Robert Teese

Professor, School of Physics and Astronomy



Mike Eastman

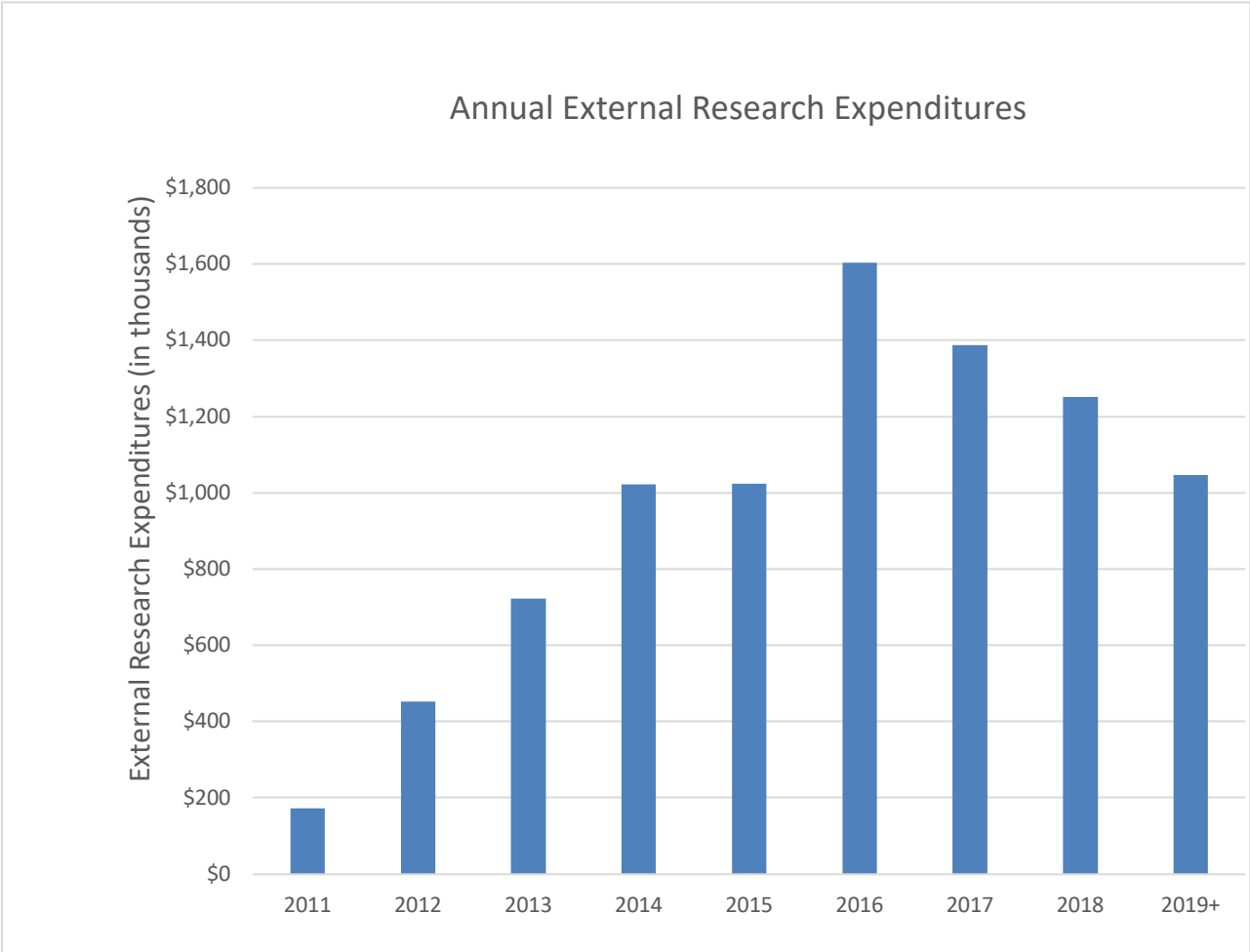
Associate Dean and Professor,
College of Engineering Technology



Christina Goudreau Collison

Professor, School of Chemistry & Materials Science

RESEARCH FUNDING



During the 2018 – 2019 academic year CASTLE has led or collaborated on 24 different grants that total more than \$8.0 million.

Current CASTLE Funding

Dates	Total Funding	Funding Details	Personnel
6/2013-8/2019	\$899,907	Metacognition: A Transformative Approach to Retaining Deaf/HoH and first generation STEM Majors; NSF- National Science Foundation	PI Scott Franklin, Co-PI Elizabeth Hane
7/2013-6/2017	\$199,980	Collaborative Research: Transforming the Organic Chemistry Experience: Development, Implementation and Evaluation of Studio-Based Modules; NSF-National Science Foundation	PI Christina Goudreau, Co-PI Thomas Kim
9/2014-8/2018	\$399,309	Transfer of Math, Physics, and Communication Skills Into the Entry-level Photonics Workforce; NSF- National Science Foundation	PI Benjamin Zwickl, Co- PI Kelly Norris Martin
9/2014-8/2018	\$372,580	Collaborative Research: Development and Assessment of Interactive Video Vignette Modules for Biology Teaching; NSF-National Science Foundation	PI Robert Teese, Co-PIs Leslie Kate Wright and Dina Newman
10/2014-9/2018	\$339,825	REU Site: Model-Based Reasoning and Representations in STEM Learning at the Rochester Institute of Technology; NSF- National Science Foundation	PI Leslie Kate Wright, Co-PI Dina Newman
5/2015-4/2020	\$615,969	CPS: Frontier: Collaborative Research: Compositional, Approximate, and Quantitative reasoning for Medical Cyber-Physical Systems	PI Elizabeth Cherry
6/2015-6/2018	\$111,002	Collaborative Research: Role of Undergraduate Biochemistry Education in Protein Function Assignment; NSF- National Science Foundation	PI Paul Craig, Co-PI Herbert Bernstein
9/2015-8/2018	\$270,225	The Access Network: Supporting Retention and Representation in Physics through an Alliance of	PI Scott Franklin

		Campus-Based Diversity Programs; NSF-National Science Foundation	
5/2016-5/2020	\$649,626	Collaborative Research: Exploring factors that shape education and workplace training on essential 21 st Century Competencies: A translational study in Four High-STEM Job Regions; NSF- National Science Foundation	PI Benjamin Zwickl, Co- PI Kelly Norris Martin
9/2016-8/2019	\$419,284	Collaborative Research: Transforming the Organic Chemistry Lab Experience: Implementation and Evaluation of a Reformed Organic Lab Curriculum Across Institutions; NSF-National Science Foundation	PI Christina Collison, Co- PI Dina Newman
9/2016-8/2019	\$299,982	Collaborative Transformation through Faculty Triads; NSF- National Science Foundation	PI Scott Franklin, Co- PI Sophia Maggelakis
9/2016-8/2019	\$428,022	Collaborative Research: NRT-IGE: Deploying Holistic Admissions and Critical Support Structures to Increase Diversity and Retention of US Citizens in Physics Graduate Programs; NSF- National Science Foundation	PI Casey Miller, Co- PIs Ben Zwickl, Scott Franklin
9/2016-8/2019	\$73,740	Collaborative Research: The PIPELINE Network; NSF-National Science Foundation	PI Linda Barton, Co-PI Ben Zwickl
10/2016-9/2018	\$18,072	NSF Includes: A National Network for Access and Inclusion in Physics Graduate Education; NSF-National Science Foundation / APS-American Physics Society	PI Casey Miller
1/2017-4/18	\$99,680	Integrated Photonics Workforce Needs Assessment for New York State; DOD – Department of Defense	PI Ben Zwickl, Co-PIs Anne Leak, Kelly Martin
7/2017-6/2020	\$253,052	Collaborative Research: Data Integration in Undergraduate Mathematics Education; NSF-National Science Foundation	PI Paul Wenger, Co-PIs Matthew Hoffman, Carl Lutzer

9/2017-8/2022	\$1,000,000	HHMI USE Inclusive Excellence 2017; HHMI-Howard Hughes Medical Institute	PI Scott Franklin, Co-PIs Jennifer Connelly, Elizabeth Hane, Lea Michel, Dina Newman
9/2017-8/2020	\$97,372	Collaborative Research: Using protein function prediction to promote hypothesis-driven thinking in undergraduate biochemistry education; NSF-National Science Foundation	PI Paul Craig, Co-PIs Herbert Bernstein, Jeffery Mills, Suzanne O'Handley
8/2018-7/2021	\$234,989	Collaborative Research: Developing a quantitative three-dimensional understanding of cardiac arrhythmias	PI Elizabeth Cherry, Co-PI Matthew Hoffman
9/2018-8/2021	\$134,491	Collaborative Research: Expanding Access: Furthering a network of diversity- focused programs in the physical sciences	PI Scott Franklin
10/2018-9/2021	\$290,104	Collab: Interactive Video-Enhanced tutorials on problem solving in Physics	PI Robert Teese, Co-PI Michelle Chabot
9/2018-8/2023	\$115,714	Collaborative Research: NSF Includes Alliance Graduate Education Network	PI Casey Miller
2/2019 -1/2024	\$524,692	CAREER: A computational approach to the study of behavior and social interaction	PI Ben Zwickl
5/2019-4/2024	\$ 486,124	CAREER: Learning to solve problems in context rich environments	PI Ifeoma Nwogu

Pending CASTLE Funding

Dates	Total Funding	Funding Details	Personnel
6/2020-5//2025	\$968,640	Critical Mass of Engineering Technology Scholars – Second Edition (CoMETS 2.0) - NSF	PI Jeanne Christman, Co-PIs Betsy Dell, Mike Eastman, Jennifer O’Neil, Maureen Valentine
9/2019 – 8/2022	\$499,795	Testing Predictions of Institutional Change Theories for Programs Focused on Improving Inclusion - NSF	PI Scott Franklin
9/2019 – 8/2024	\$238,334	Collaborative Research: The PIPELINE Community: Fostering the Growth of a Networked Improvement Community for Physics Innovation and Entrepreneurship Education – APS; NSF	PI Ben Zwickl

CENTER EVENTS

1. The 6th Annual CASTLE Symposium

The 6th annual CASTLE Symposium was held on Wednesday, May 8, 2019 in the Center for Integrated Manufacturing Studies (CIMS Conference Room). The symposium began with a poster session that showcased more than 20 student and faculty research projects focused on improving STEM education. More than 50 people attended to celebrate together the research being done in STEM education by faculty and students. College of Science Dean Sophia Maggelakis and Provost Ellen Granberg provided opening remarks. An award ceremony followed honoring recipients of the 5th “Science and Math Education Research Special Honor Award” and recognition of the 2018 – 2019 academic year Undergraduate Learning Assistants, Learning Assistant Mentors and Inclusive Excellent cohort members.

2019 Science and Math Education Research Special Honor Award Recipients:

- Sam Cammarata 4th year student, IMPRESS, Learning Assistant
- Stacey Davis NTID Science and Mathematics Support Coordinator
- Mike Eastman Associate Dean, College of Engineering Technology
- Debra Jacobson CASTLE Marketing Specialist

2018 – 2019 Undergraduate Learning Assistants:

Lucas Berens, Julia Biehler, Diksha Biswa, Nicholas Blachowicz, Brandon Bogner, Kyle Buohl, Lauren Burr, Sam Cammarata, Anna Capria, Aaric Celeste, Regina Chartier, Jessica Chellino, Devon Christman, Leah Coleman, James Denkenberger, Isaac Deppen, Daniel Devor, Oluwatosin Femi-Lawal, Eilleen Figueroa, Victoria Gazzillo, Sydney Geidel, Diamond Guy, Justin Harverlick, Miranda Hebert, Gretchen Horst, Niaya Jackson, Melody Kabbai, Maha Khokhar, Darek LaBare, Brian Lake, Andre Lebron, Vina (James) Macias, Evan Manfreda-Schulz, Jordan McNaughton, Liam Megraw, Logan Melacam, Teriana Mewborn, Jennifer Meyers, Amanda Michels, Alana Moraes, Natasha Nigam, Paige Norris, Mike Nystoriak, Kristen Patten, Sophia Pizzola, Jacob Poirier, Thomas Quinn, Irtaza Razvi, Luke Reber, Kory Schimmelpfennig, Remi Schneider, Nicklas Smith, Rachel Taylor, Maddie Tebrugge, Adan Tobias, Ashley Tucker, Nasheett Usman, Carlos Vazquez, Ryan Wills, Emalee Wrightstone

2018 – 2019 Learning Assistant Mentors:

Alla Bailey, Amanda Bao, Susan Bateman, Liz Bremer, Dawn Carter, Michelle Chabot, Anthony Chirico, Steven Ciccarelli, Elizabeth DiCeare, Kristina Driscoll, Connie Fitch, Schott Franklin, Aditya Yechan Gunja, Ed Hach, Luane Haggerty, Andy Head, Karl Korfmacher, Premlata Kumar, Carrie Lahnovych, Joseph Lanzafame, Charlie Lusignan, Danny Maffia, Aaron McGowan, Louis McLean, Dina Newman, Sheth Nyibule, Mark Olles, Deana Olles, Niels Otani, Thomas Prevendoski, Anne Marie Ross, Deirdre Schlehofer, Joel Shore, Kaitlin Stack-Whitney, Robert Szalapski, Corinne Teravainen, Kate Wright

2. Learning Assistant Program Fall/Spring Recruitment Fairs

The LA Program hosted two recruitment fairs, one in the Fall semester (October 19) and one in the Spring semester (March 22), which were great opportunities for interested students. The recruitment fairs started with a presentation by the Program Director, Scott Franklin, providing more details on the program, including expectations and commitments. After the Q & A session a student panel of current learning assistants spoke about their experiences and the benefits of the program. Students were then encouraged to visit with a faculty mentor from the department for which they are interested in being an LA.

PUBLICATIONS

The CASTLE Center had 18 publications by core CASTLE members.

Bold = core CASTLE member, * = undergraduate student

Donahue CJ*, Adair AA*, **Wright LK** and **Newman DL** (2019). A Close-up Look at PCR. *CourseSource*. Vol(6),1-8. <https://doi.org/10.24918/cs.2019.3>

Franklin SV, Hane E, Kustus MB, Ptak C, Sayre EC (2018). Improving Retention Through Metacognition: A Program for Deaf/Hard-of-Hearing and First-Generation STEM College Students. *Journal of College Science Teaching* 48 (2), 21-27.

Henderson C, Connolly M, Dolan EL, Finkelstein N, **Franklin S**, Malcom S, Rasmussen C, Redd K, St. John K (2017). Towards the STEM DBER Alliance: Why we need a discipline-based STEM education research community. *International Journal of STEM Education* 4 (1), 14.

Kim T, **Wright LK**, Miller K* (2019). An examination of students' perceptions of the Kekulé resonance representation using a perceptual learning theory lens. *Chemistry Education Research and Practice*. DOI: [10.1039/C9RP00009G](https://doi.org/10.1039/C9RP00009G)

Leak A, Santos Z, Reiter E, **Zwickl B**, **Martin K** (2018). Hidden factors that influence success in the optics workforce *Physical Review PER*, **14**, 010136

Martin KN, Gaffney AL, Leak AE, Nelson J*, Cervantes AT*, Gardener KL, Clark B*, **Zwickl, BM** (2018). Spewing nonsense [or not]: communication competence and socialization in optics and photonics workplaces *Communication Education*, **67**, 414-437

Miller CW, **Zwickl BM**, Posselt JR, Silvestrini RT, Hodapp T (2019). Typical Physics PhD Admissions Criteria Limit Access to Underrepresented Groups but Fail to Predict Doctoral Completion. *Science Advances*

Newman DL, Stefkovich M*, Clasen C*, Franzen M, **Wright LK** (2018). Physical Models Can Provide Superior Learning Opportunities beyond the benefits of active engagement. *Biochem Mol Biol Educ*. 46 (5): 435-444. Doi: 10.1002/bmb.21159.

Owens L, **Zwickl BM**, **Franklin SV**, Miller CW (2018). Misaligned Visions for Improving Graduate Diversity: Student Characteristics vs. Systemic/Cultural Factors. *Proceedings of the 2018 Physics Education Research Conference*, Washington, DC.

Owens L, **Zwickl BM**, **Franklin SV**, Miller CW (2018). Graduate Admissions Training Modules for Physics Faculty. Partnered with APS. Current available modules: The Legal Landscape of Admissions, The Use of GRE Scores, Using Rubrics in Admissions, and New Graduate Student Induction.

Owens L, Zwickl BM, Franklin SV, Miller CW (2019) Identifying Qualities of Physics Graduate Students Valued by Faculty. *Proceedings of the 2019 Physics Education Research Conference*, Provo UT.

Pelaez N, Anderson TR, Gardner SM, Yin Y, Abraham JK, Bartlett EL, Gormally C, Hurney C, Long TM, **Newman DL**, Sirum K, Stevens MT (2018). A Community-building Framework for Collaborative Research Coordination Across the Education and Biology Research Disciplines. *CBE-Life Science Education*. 17 (2):es2, 1-10. Doi:10.1187/cbe.17-04-0060.

Teese R, Koenig K, Jackson D (2018). Interactive Video Vignettes for Teaching Science, Active Learning in College Science: The Case for Evidence-Based Practice, 1st Edition, *Springer Nature*, Berlin, Germany.

Terrell CR, Franzen MA, Herman T, Malapati S, **Newman DL, Wright LK** (2019). Physical Models Support Active Learning as Effective Thinking Tools. Bussey T, Cortes K, Austin R, eds. *Biochemistry Education: Discussions of the Classroom and Laboratory Environments*. ACS Books, *in press*.

Wright LK, Dy GEC*, **Newman DL** (2019). Undergraduate Textbook Representations of Meiosis Neglect Essential Elements. *Am. Biol. Teacher*, *in revision*.

Wright LK, Cardenas JJ*, Liang P*, **Newman DL** (2018). Arrows in Biology: Lack of Clarity and Consistency Points to Confusion for Learners. *CBE-Life Sci Educ*. 17 (1):ar6, 1-13. Doi:10.1187/cbe.17-04-0069.

Young NT*, Santangelo B*, **Martin KN**, Leak AE, **Zwickl BM** (2018). Models of Math Use in Non-Academic Workplace Settings (pp. 452-455). 2017 Physics Education Research Conference Proceedings. Retrieved from <https://www.compadre.org/per/items/detail.cfm?ID=14667>.

Zwickl BM, Chen K*, Deslongchamps J*, Leak AE, **Martin KN** (2018). Characterizing analytical and computational mathematics use during PhD research (pp. 476–479). 2017 Physics Education Research Conference Proceedings. Retrieved from <https://www.compadre.org/per/items/detail.cfm?ID=14674>

PRESENTATIONS

The CASTLE Center had 48 presentations by core CASTLE members.

Anderson J, **Newman DL**, Edelbach B, Collison CG, Cody J (August, 2018). Gauging the Impact of Organic Chemistry REActivities at a four-year and a two-year institution. Oral presentation at the *Biennial Conference on Chemical Education*, South Bend, IN.

Carusone C*, **Zwickl BM** (August, 2019). Impact of Industry Experience on Faculty Teaching Practices in STEM. Poster presented at the RIT Undergraduate Research Symposium, Rochester, NY.

Cervantes, A*, & **Martin, KN** (October, 2018). Some People Are Just Naturally Good at That: Values and Beliefs towards Communication in Photonics and Optics. McNair Conference at the University of Maryland-College Park.

Coakley A*, **Newman DL**, **Wright LK** (August, 2019). Communicating Ideas in Molecular Biology: Novice vs. Expert Representations. Poster presented at the RIT Undergraduate Research Symposium, Rochester, NY.

Cortez P*, **Wright LK**, **Newman DL** (August, 2019). Development and testing of a new method to teach meiosis with 3D models. Oral presentation at the RIT Undergraduate Research Symposium, Rochester, NY.

Dy GEC*, **Wright LK**, **Newman DL** (July, 2018). Visual Representations of Meiosis in Biology Textbooks Fail to Provide Important Conceptual Information. Poster presented at the *Society for the Advancement of Biology Education Research 8th Annual Meeting*. Minneapolis, MN.

Gallagher V, **Martin KN** (November, 2018). Visual and Material Wellbeing in Urban and Healthcare Contexts National Communication Association, Salt Lake City, UT.

Gardner SM, Pelaez N, **Newman DL**, Abraham JK, Beck C, Anderson TR, Yin Y (July, 2018). Development and Testing of Competencies for Experimentation in Biology. Oral presentation at the *Society for the Advancement of Biology Education Research 8th Annual Meeting*. Minneapolis, MN.

Gomez-Bera M*, **Franklin SV** (August, 2019). Mapping Student Frames in Upper-Level Electricity and Magnetism. Poster presented at the RIT Undergraduate Research Symposium, Rochester, NY.

Hernandez A*, **Wright LK**, **Newman DL** (August 2019). Improving Teacher Understanding and Classroom Practice about Meiosis. Poster presented at the RIT Undergraduate Research Symposium, Rochester, NY.

Heath G*, **Franklin SV** (August, 2019). Identifying Epistemic Frames in Student Problem-Solving. Oral presentation at the RIT Undergraduate Research Symposium, Rochester, NY.

Hora MT, Smolarek, BB, **Norris Martin K**, Scrivener L (April, 2019). Exploring the Situated and Cultural Aspects of Communication in the Professions: Implications for Teaching, Student Employability, and Equity in Higher Education. *American Educational Research Journal*. pp. 1–41 DOI: 10.3102/0002831219840333

Howard J*, **Wright LK**, **Newman DL** (April, 2018). Conceptualizing Information Flow: from Concrete to Abstract. *26th Annual C-STEP Statewide Student Conference*. Bolton Landing, NY.

Leak AE, Santos Z*, Reiter E, **Martin KN**, **Zwickl B** (June, 2018). Hidden factors that influence success in the optics workforce. *Physical Review Physics Education Research*, 14.

Leak AE, Rothwell SL, Olivera J*, **Zwickl B**, Vosburg J*, **Martin KN** (June, 2017). Examining problem-solving in physics-intensive PhD research. *Physical Review Physics Education Research*, 13 (2).

Macias V*, **Rothwell S**, **Zwickl BM** (August, 2019). Transferability and specialization: analyzing students' perspectives. Poster presentation at the RIT Undergraduate Research Symposium, Rochester, NY.

Magalhães RM, **Newman DL**, Hane EN, Michel LV, Connelly J, **Franklin SV** (July, 2018). Inclusive Excellence: A Three-Pronged Approach to Increasing Diversity and Retention in Science. Poster presented at the Society for the Advancement of Biology Education Research 8th Annual Meeting. Minneapolis, MN.

Magalhães RM, **Wyatt, BN**, **Newman DL**, **Franklin SV** (June, 2019). We Talk the Talk, but Do We Walk the Walk? What Factors Keep Faculty from Implementing Inclusive Teaching and What are the Keys to Success? Gordon Research Seminar & Conference, Bates College, Lewiston, ME.

Martin K, Cervantes, A*, **Zwickl B** (November, 2018). Communicative mindsets: How perceptions of entry-level employees' natural communication ability impact learning opportunities. National Communication Association, Salt Lake City, UT.

Martin KN, Gaffney, ALH, Leak, AE, Nelson J*, Cervantes, AT*, Gardner KL, Clark B L*, **Zwickl BM** (August, 2018). Spewing Nonsense [or not]: Communication competence and socialization in optics and photonics workplaces. *Communication Education*, 67(4), 414-437.

Michel LV, **Newman DL**, **Magalhães RM**, **Wyatt BN** (March, 2019). Developing an Inclusive Workshop Series for Faculty Mentoring Diverse Research Students. Poster presented at the *American Society of Biochemistry and Molecular Biology Conference*. Orlando, FL.

Newman D. (February, 2019). “Microaggressions.” College of Science, Rochester Institute of Technology. Rochester, NY.

Newman D, Dougherty M (October, 2018). “Conceptual Foundations of Gene Editing.” American Society of Human Genetics Undergraduate Faculty Genetics Education Workshop. San Diego, CA.

Newman D (October, 2018). “Web Tools and Analysis of Assessment Data for Biology Education Research.” Interdisciplinary STEM Education Research Forum, Rochester Institute of Technology, Rochester, NY

Newman DL, Connelly J, Hane E, Michel LV, DaCosta TC, **Magelhães RM, Wyatt B, Franklin SV** (November, 2018). Fostering Inclusivity and Equity: a Three-Strand Approach for Research, Classroom and Community. Poster presented at the American Association of Colleges & Universities and Project Kaleidoscope’s *2018 Transforming STEM Higher Education Conference*. Atlanta, GA.

Newman DL, Spector H*, Steele J*, Wrightstone E*, **Wright LK.** (July, 2019). The DNA Illustration Spectrum: The Variety of Ways in which DNA is Represented to Biology Learners. *Society for the Advancement of Biology Education Research 8th Annual Meeting*. Minneapolis, MN.

Newman D, Wright K (July, 2018). “Meiosis: A Play in Three Acts.” Center for Biomolecular Modeling, Milwaukee School of Engineering, Milwaukee, WI.

Newman DL, Dy GEC*, Jan M*, **Wright LK** (October, 2018). How is Meiosis Taught in High School? A Critical Gap for Students. Poster presented at the *American Society of Human Genetics Annual Meeting*. San Diego, CA.

Newman DL and **Wright LK** (July, 2018). How to Get More Out of Conceptual Assessments. Oral presentation at the *Society for the Advancement of Biology Education Research 8th Annual Meeting*. Minneapolis, MN.

Owens L, Mekker J*, **Zwickl B, Franklin S,** Miller C (July, 2019). “Implications for Graduate Student Advising Based on Faculty Hiring Data.” Presented as an oral presentation at the AAPT International Conference hosted by the American Association of Physics Teachers, Provo, UT.

Owens L, Zwickl, B, Franklin, S, Miller C (July, 2019). “Role of Elite Universities in Improving Diversity Among Physics Faculty. Presented as an oral presentation at the PERC. Conference, Provo, UT.

Owens L, Zwickl B, Miller C. (March, 2019). Homophily—What’s The Message? Presented as an oral presentation at Cornell University, Ithaca, NY.

Poirier J*, **Rothwell S, Zwickl BM.** (August, 2019). Preventative and Exploratory: Two workplace problem-solving cultures. Poster presentation at the RIT Undergraduate Research Symposium, Rochester, NY.

Powell L*, **Zwickl BM** (August, 2019). The Unique Benefits of a Physics Degree in STEM and Non-STEM Jobs. Oral presentation at the RIT Undergraduate Research Symposium, Rochester, NY.

Quintero R*, **Bailey J** (August, 2019). Protocol Development for Spatial Visualization. Poster presentation at the RIT Undergraduate Research Symposium, Rochester, NY.

Ross R*, **Zwickl BM, Martin KN** (August, 2019). Improving Communication Competency in Higher Education and STEM Industries. Poster presentation at the RIT Undergraduate Research Symposium, Rochester, NY.

Rothwell S (October, 2018). Investigating Question Asking Behavior of STEM Undergraduates. RIT's Interdisciplinary STEM Education Research Forum).

Shar K*, **Zwickl BM, Miller CW, Owens L** (August, 2019). Student and Faculty Perspectives of Retention in Physics Graduate Programs. Oral presentation at the RIT Undergraduate Research Symposium, Rochester, NY.

Trumpore L*, Hernandez A*, **Newman DL, Wright LK** (August, 2019). Using the DNA Triangle to Uncover Gaps in High School Teaching of Meiosis. Poster presented at the RIT Undergraduate Research Symposium, Rochester, NY.

Williamson K*, **Zwickl BM** (August, 2019). Students' Perspectives of Social Impact in the Physics Discipline. Poster presentation at the RIT Undergraduate Research Symposium, Rochester, NY.

Worrell T, **Martin KN** (May, 2018). *Measuring Design Principles: Comparing the Perception of Two Cultures*. 68th Annual ICA conference Prague, Czech Republic.

Wright LK, Newman DL (July, 2018). High school teacher conceptions and lessons about meiosis reveal a critical gap in the biology curriculum. Oral presentation at the *Society for the Advancement of Biology Education Research 8th Annual Meeting*. Minneapolis, MN.

Wright LK, Newman DL, Dy GE* (June, 2019). A Critical Gap: High school teacher conceptions and lessons about meiosis reveal a gap in the biology curriculum. Poster presented at the *Gordon Research Conference on Undergraduate Biology Education Research*. Lewiston, ME.

Wyatt B (April, 2019). Are You a Scientist? Exploring Science Identity in a Structural Biology Outreach Program. Session: Exploring Biochemistry Teaching and Learning, *American Society for Biochemistry and Molecular Biology Annual Meeting*.

Zwickl B (December, 2018). Physics education for career preparation: Lessons from optics and photonics, Physics Colloquium at Kansas State University, Manhattan, KS.

Zwickl B (October, 2018). Physics education for career preparation: An opportunity and vision for the future, University of Colorado Boulder Physics Education Research Seminar, Boulder, CO.

Zwickl B (August, 2018). Measurement: A rich and ubiquitous context for mathematization in physics, Poster at the 2018 Physics Education Research Conference, Washington, DC.

Zwickl B (July, 2018). Epistemic Modeling Games within Physics-Intensive Workplaces, Talk at the 2018 AAPT Summer Meeting, Washington, DC.

STUDENTS MENTORED

The SMERC group plays a large role in mentoring Rochester Institute of Technology undergraduate students, as well as undergraduate students from other universities, to support experiential learning. SMERC members' consistent involvement with student-centered research aligns with RIT's strategic plan of becoming a student-centered research university.

Dina Newman and Kate Wright (Co-mentors)

Grace Elizabeth Dy (REU 2018, University of Washington)

Anna Neuenschwander (medical illustration)

Hannah Spector (1st year biotech)

Julia Steele (1st year biotech)

Lauren Trumpore (2nd year biotech, COS SURF 2019)

Tony Wen (1st year biotech)

Emalee Wrightstone (2nd year biotech)

Aeowynn Coakley (REU 2019, San Jose State U)

Paulina Cortez (REU 2019, San Diego State U)

Aimee Hernandez (REU 2019, U Texas El Paso)

Scott Franklin

Manuel Gomez-Bera (3rd year Physics)

Grace Heath (REU 2019, Loyola University New Orleans)

Ben Zwickl

Christopher Webster (RIT, physics)

Vina Macias (RIT, physics)

Jacob Poirier (RIT, physics)

Jessica Hathaway (REU 2018, East Carolina State University)

Latrell Powell (RIT, physics)

Krystina Williamson (REU 2019, Barnard College)

Carmen Carusone (REU 2019, The College of New Jersey)

Lindsay Owens

Jacob Makker (RIT, physics)

Kelli Shar (REU 2019, University of Tampa)

Sue Rothwell

Jacob Poirier, Undergraduate Research Assistant (3rd year Physics/Math minor)

Vina Macias, Undergraduate Research Assistant (3rd year Physics)

Kelly Martin

Alexandria Cervantes (REU 2018, University of California Monterey Bay)

Rebecca Ross, (REU 2019, North Carolina State University)

Grace Osytek (RIT School of Communication)

Kaleb Kronimus (RIT School of Communication)

Jes Nelson (RIT School of Communication)

Jessica Oates (RIT School of Communication)

NOTABLE ACHIEVEMENTS

Dina Newman

- 2019 Senior Editor for CourseSource
- 2019 Nominated for RIT Eisenhart Award for Outstanding Teaching Award
- 2018-2019 College of Science Distinguished Scholarship Award
- 2018-2019 College of Science Faculty Leader for Diversity and Inclusion
- 2018 Nominated for Isaac L. Jordan, Sr. Faculty Pluralism Award

Kelly Martin

- 2018-19 Martin, K.N. & Mandell, H. 2018 – 2019 Recipient of the RIT Provost's Innovative Teaching with Technology Award.

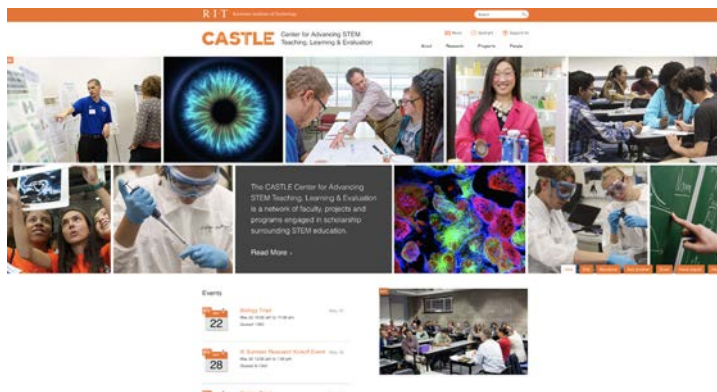
Ben Zwickl

- 2018-19 **(PI)** CAREER: Learning to solve problems in context-rich environments: A naturalistic study in STEM workplaces, research labs, project-based courses, and lab courses, National Science Foundation, DGE-1846321, 5/1/2019-4/30/2024, Funded \$486,124.

Rita Margarida Almeida Magalhães

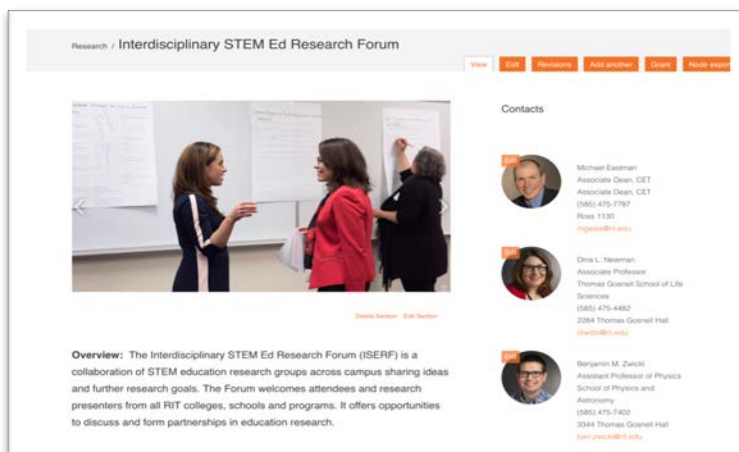
- 2018-19 Gordon Research Conference Travel Award (\$1,500)

WEBSITE



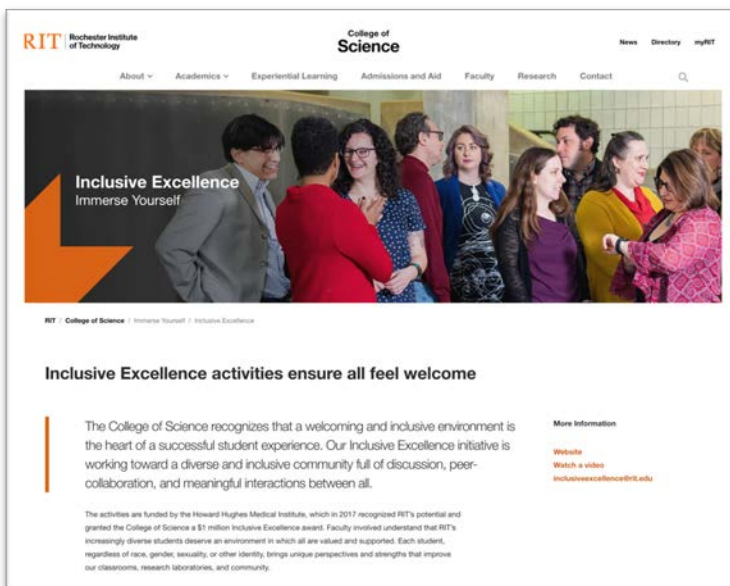
The CASTLE site serves as a home-base for all CASTLE-affiliated programs, research and initiatives.

<https://www.rit.edu/castle/>



Additional pages were added for a cross-campus Interdisciplinary STEM Education Research Forum.

<https://www.rit.edu/castle/interdisciplinary-stem-ed-research-forum>



The CASTLE Inclusive Excellence Initiative was chosen as one of the four main highlights on the College of Science new website homepage.

<https://www.rit.edu/science/immerse-yourself/inclusive-excellence>

In The News

Inclusive Excellence Cultivates Diversity (August, 2018) Research Fellowship Summer Program

<https://www.rit.edu/news/inclusive-excellence-cultivates-diversity?id=67634>

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RIT / News

August 27, 2018 by Susan Gawlowicz Follow @SGawlowicz

Inclusive Excellence cultivates diversity

Program focuses on biology, chemistry and physics



Elizabeth Lamark

The first cohort of Inclusive Excellence research fellows are Nasreen Jaft, Sofie Margaret Christie, Laurel Hunter, My'Keyzia King, Rebecca (RUBY) Zathang (in back), Jennifer Ptfaf and Ricardo Carrion. The College of Science students presented their research at the RIT Undergraduate Research Symposium in August.

DDI Newsletter Playback Theatre Story – by Debra Jacobson Read entire story...

<https://www.rit.edu/diversity/newsletter/december-2018/story/playback-theatre-experiences-expand-rit-inclusive-excellence-cohort>

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NEWSLETTER DECEMBER 2018 /

Playback Theatre Experiences Expand with RIT Inclusive Excellence Cohort Members

ARCHIVE

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Playback Theatre Experiences Expand with RIT Inclusive Excellence Cohort Members
By Debra A. Jacobson

Looking back for a moment... I am thankful to have taken part in the Playback Theatre workshop sessions. I was alongside such amazing people. We, as a group were willing to share, engage in dialog, support each other, and look deeply within at how difficult experiences strengthen us and provide opportunities to grow. What a great component of the Community Strand of the 5-year Inclusive Excellence initiative.

The RIT Inclusive Excellence Project ended year one of five with a September celebration at the home of

Listen to Audio Blog of Faculty Mentor and Summer Student Fellowship RIT *Intersections* audio blog on their conversation

<https://soundcloud.com/rittigers/intersections-the-rit-podcast-ep-5>



Ricardo Carrion

Mentor: Dr. Hans Schmitthenner
Major: Chemistry, 2nd Year
Home: Rochester, NY
Research: Detecting Prostate Cancer Through Synthesizing and Targeting Multi-Model Imaging Agents

Ricardo is an RIT Destler/Johnson Rochester City Scholar, and he wants to make a difference in other's lives who may have similar experiences growing up a minority with hardships. He hopes to go into politics, combining his scientific research and studies so as to offer educated options and perspectives pertaining to the health field and sustainability of the environment. With his mentor's guidance, he is creating peptide-based targeted molecular imaging agents (TMIA) useful for diagnosing and monitoring cancer, heart disease, or other diseases.

Inclusiveness: Expressing science through art

<https://www.rit.edu/news/student-spotlight-showing-artistic-side-science>

Rochester Institute of Technology


About Academics Experiential Learning Admissions and Aid Research RIT Life Athletics

RIT / News

March 6, 2019 by Felicia Swartzenberg

Student Spotlight: Showing the artistic side of science

Deirdre Cannon, first-year biotechnology and molecular bioscience student



Deirdre Cannon drew DNA "biology graffiti" in the atrium of the Gosnell building.

Deirdre Cannon is a first-year biotechnology and molecular bioscience student from Norfolk, Mass., who loves drawing. Cannon enjoys creating with all types of mediums, from oil painting to digital media to chalk. Recently, Cannon was able to combine her love for art and science to create "biology graffiti" to be used as a poster backdrop for RIT's Howard Hughes Medical Institute (HHMI) Inclusive Excellence initiative.

RIT's HHMI Inclusive Excellence initiative, made possible by a \$1 million grant from the

Topics

- art and design
- diversity
- health
- interdisciplinary studies

September, 2018 - RIT Spotlight



CASTLE hosts summer program to advance research methods

Scott Franklin, professor in the School of Physics and Astronomy, and faculty associates Eleanor Sayre (Kansas State University) and Mary Bridget Kustus (DePaul University) ran a two-week summer program through the Center for Advancing STEM Teaching Learning and Evaluation (CASTLE) titled "[Professional-development for Emerging Education Researchers \(PEEB\)](#)" on the RIT campus. Participants were from University of Rwanda, Georgia Southern University, University of Florida, University of Utah, NYU Abu Dhabi, University of Regina, Illinois State University and RIT. The goal of the conference was to develop a diverse research network who will continue to collaborate about research methods and theories via bi-weekly video conferences throughout the year.

October, 2018- RIT - Spotlight



Inclusive Excellence hosts Forum on Inclusion & Diversity

On October 24, the **Inclusive Excellence** group hosted a forum to discuss the results of their survey examining faculty perspectives about inclusion in the College of Science. You can see the survey questions here: <https://bit.ly/2DdiLFC>. Results will be shared at a later date.



Staff win Dean's professional development awards

Two College of Science staff members have been awarded funds to enhance professional development. **Narayan Wong**, research technician, GSoLS will receive funding to attend a two week Statistical Methods course at Cold Spring Harbor to build proficiency in computational analysis tools specific to Next Generation Sequencing. **Stephanie Livingston-Heywood**, staff assistant, CASTLE/Inclusive Excellence will receive funding to develop an ASL course for all COS faculty and staff to enhance the ability to understand and communicate with deaf and hard of hearing persons.



CASTLE hosts STEM Ed research forum

On October 30, the **Center for Advancing STEM Teaching, Learning, and Evaluation** hosted an interdisciplinary research forum on research in STEM education during which presenters shared ideas for funding research in this field. GSoLS professor, **Dina Newman** presented a talk on "Web Tools and Analysis of Assessment Data for Biology Education Research" and Life Sciences visiting assistant professor, **Katilyn Stack-Whitney** presented "Knowledge Flows: 'virtual water' as a case for understanding prizes' impact on STEM." The workshop also included small group discussions and feedback development of new collaborations.

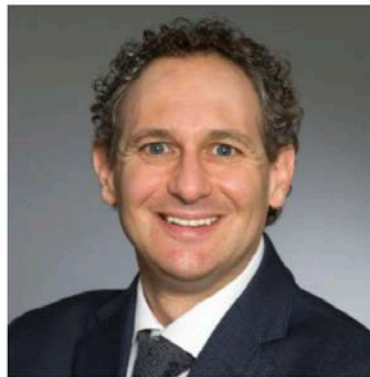
November, 2018 – RIT University News



Inclusive Excellence hosts anti-racism activist

Internationally acclaimed anti-racism activist, feminist, and educator Jane Elliott was the invited speaker for November's **Inclusive Excellence** event. Webb Auditorium was filled to capacity for Elliott's talk, titled "Power, Perception and Prejudice," held November 6.

December, 2018 – RIT University News



How metacognition supports classroom inclusion

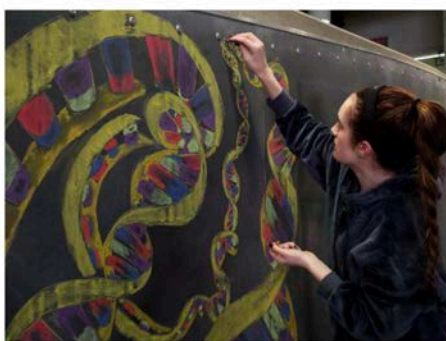
On December 5, **Inclusive Excellence** faculty members, **Elizabeth Hane**, associate professor, GSOLS and **Scott Franklin**, professor, SoPA led a panel discussion of IMPRESS students about their experiences of learning after taking a metacognition class. The discussion focused on techniques that promote metacognition and ideas to help instructors incorporate inclusive practices into the classroom. The event was hosted by the College of Science and sponsored by Inclusive Excellence.

January, 2019 – Local WROC TV Interview with Inclusive Excellence Community Strand | Diversity Theater Director, Tina Chapman DaCosta

<https://www.rochesterfirst.com/adam-interviews/adam-interviews-special-race-in-rochester/1714103240>



February, 2019 – RIT Spotlight with Two Inclusive Excellence Classroom Practice Faculty Cohort Members and Student Deirdre Cannon



Art in Science

First-year Biotechnology & Molecular Bioscience student, **Deirdre Cannon** works on bio graffiti as an HHMI Inclusive Excellence project being encouraged by Community Strand faculty liaisons **Beth VanWinkle**, lecturer, GSoLS and **Dawn Carter**, senior lecturer, GSoLS (l to r).

The incentive to create science in art forms opens up conversation, deepens inclusion, and engages students to communicate individual interpretations through a universal vehicle.



SoPA lecturer recognized for efforts to enhance diversity

Jennifer Connelly, SoPA lecturer, was named as the 2018-19 Isaac L. Jordan, Sr. Faculty Pluralism Award recipient. Jennifer is being recognized for significant contributions to enhance diversity in the university through a variety of channels, including her work with the HHMI Inclusive Excellence program. Award recipients will be honored with an awards ceremony at Ingle Auditorium on April 16, 2019.

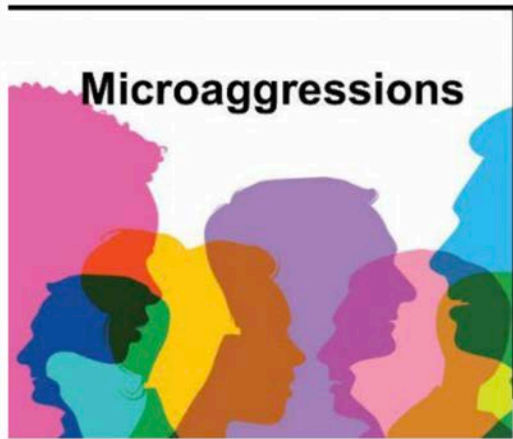
Our Stories and News



COS welcomes John Wiley Jones Distinguished Speaker for talks on research and faculty mentoring

The College of Science and the Thomas H. Gosnell School of Life Sciences welcomed Dr. Beronda Montgomery, Foundation Professor in the [Plant Research Laboratory](#) at Michigan State University as this year's John Wiley Jones Distinguished Speaker. In her lecture, titled "Seeing the Light: Plant Color Vision and Developmental Acclimation," Dr. Montgomery shared her research about the specific mechanisms of light mediation affecting the growth and development of plants. Although her studies are on the cellular scale, her findings are adding significantly to the knowledge of our natural world.

In addition to her significant research on plant development, Dr. Montgomery is also an expert on faculty development and mentoring. In this capacity, she was invited by the Inclusive Excellence Initiative to give a second presentation on that topic. Her workshop, "Lighting the Way: Building Bridges to Access and Success Through Progressive Mentoring," translated the lessons that have emerged from investigating the specific ways in which largely immobile organisms adapt their patterns of growth and development to fluctuations in external environmental parameters to increase their survival and productivity to mentoring and professional development interventions. These lessons are intended to inform practices that promote the success of participants in academic sciences.



Inclusive Excellence event: Microaggressions

The HHMI Inclusive Excellence Initiative hosted an event to educate COS faculty, staff, and students about Microaggressions. At the event held on February 13, attendees:

- discussed how language can inadvertently communicate negative messages with adverse effects on individuals of different identities,
- learned how microassaults, microinsults and microinvalidations affect our classrooms and campus community, and
- shared effective strategies for addressing microaggressions.

March, 2019 – Ben Zwickl Wins Federal Award


<https://www.rit.edu/news/rit-faculty-earns-federal-award-study-how-help-more-students-become-scientists-and-engineers>

RIT / News

March 26, 2019 by Luke Auburn Follow @lukeauburn

RIT faculty earns federal award to study how to help more students become scientists and engineers

Study will assess how experiential learning improves interest, retention and career preparation



Part of the five-year, \$485,124 grant will allow RIT to design and implement a project-based physics course for freshman physics majors, similar to the Imaging Science program's Innovative Freshman Experience class, pictured here.

Gabrielle Pucknette-D'Elia

The image shows three students in a laboratory setting working on a large, illuminated geodesic dome structure. The dome is made of a network of black rods forming a spherical shape, with some internal components glowing. The students are looking at the structure with interest.

CASTLE's Learning Assistant Makes RIT News

<https://reporter.rit.edu/features/castle-learning-assistants>

April 28, 2018 by **Susan Gawlowicz**  Follow **@SGawlowicz**

Graduating biotech major found enriching experiences at RIT



Ashley Adair, a graduating biotechnology major at RIT, is finishing her last semester on co-op at Vaccinex Inc., a biotech firm in Rochester, N.Y.

Topics

science

University Communications is highlighting a few members of the Class of 2018. See more commencement news at rit.edu/news/commencement.

REPORTER    

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CASTLE LEARNING ASSISTANTS

by **Salman Mustafa** | published Apr. 15th, 2018



Loryn Johnson, second year Biotechnology major and class learning assistant, helps Kenneth DeJesus, first year Biology major, in Introduction to Biology II in Gosnell Hall in Henrietta, N.Y., March 28, 2018. Photo by Daniel Vasta

May, 2019 – RIT Spotlight



Inclusive Excellence hosts two workshops

The **Inclusive Excellence** team hosted two workshops for peer institutions on April 12 and April 13. The HHMI Great Lakes Peer Implementation Cluster (PIC), which includes representatives from Oberlin College, Kenyon College and Lawrence Technical Institute, gathered at RIT on April 12. Attendees were lead through exercises conducted by the [Alan Alda Center for Communicating Science](#) to share ideas and develop strategies about communicating effectively with faculty, staff, students, and institute administrators.

On April 13, [Project Kaleidoscope](#) (PKAL) held its Upstate New York Regional Network meeting at RIT. This meeting attracted STEM faculty from all around the upstate New York area, including Syracuse, Cornell, Buffalo, Geneseo, and Alfred to discuss Faculty Development for Inclusive Excellence in STEM.

PEER Program in Rwanda - Read entire article. . .

<https://www.phys.ksu.edu/news/news-stories/2018/sayre.html>



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Physics faculty member conducts field school in Rwanda

Eleanor Sayre, associate professor of physics, led a field school in Rwanda August 13–15 with colleague Scott Franklin, Rochester Institute of Technology (RIT).

The field school "Professional-development for Emerging Education Researchers (PEER)" is the second of its kind to be conducted in Rwanda, and the first at the University of Rwanda (UR). Profs Sayre and Franklin led a PEER field school at the University of Kibungo last year. The PEER program fosters education research expertise in graduate students, postdocs, and faculty through intensive workshops and biweekly remote project meetings. The program is experiential: during the field school, participants work to clarify their research questions, design cutting edge research projects, and prepare for data analysis and publication.



"PEER is a great opportunity for new researchers to learn how to do education

May, 2019 – RIT Campus Spotlight: CASTLE 6th Annual Symposium

Rochester Institute of Technology

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Campus Spotlight

May 9, 2019



Photo by A. Sue Weisler

Jacob Mekker, a fourth-year student in the School of Individualized Study from Syracuse, N.Y., explains his research to Sheth Nyibule, a lecturer in physics. RIT's Center for Advancing STEM Teaching, Learning and Evaluation held its sixth annual CASTLE Symposium on May 8. The event celebrated faculty and student research and work focused on improving STEM education.