

2020-2021 CASTLE Annual Report



**Collaborative Scholarship
Interdisciplinary STEM Ed Research
Pedagogical Programs
Mentoring Research Experiences**

RIT

College of Science
**Center for Advancing STEM Teaching,
Learning and Evaluation**

TABLE OF CONTENTS

AY 9/1/20 – 8/31/21

Message From the Director.....	2
Mission and Vision Statement.....	3
Research Initiatives.....	4
Research Activities.....	10
Flagship Programs.....	13
Faculty, Staff and Postdoctoral Researchers.....	30
Affiliated Personnel.....	32
Funding.....	33
Events.....	36
Publications.....	39
Presentations.....	41
Students Mentored.....	43
Notable Achievements.....	44
Website.....	45
Social Media.....	47
In The News.....	49



FROM THE DIRECTOR

A Challenging Year with Amazing Accomplishments

Scott Franklin
Director

Center for Advancing
STEM Teaching, Learning,
and Evaluation

What can I add to a reflection on **2020-21** that hasn't already been said? The COVID-19 pandemic forced us all into awkward compromises, whether it be hybrid classrooms, working from home and dealing with isolation and disruptions, or trying to maintain inclusive excellence and research programs through an uncertain landscape. We all showed remarkable flexibility, adaptability and communal empathy, and this allowed us to emerge from a very difficult year.

I want to give personal thanks to the CASTLE staff and faculty who worked so hard to maintain programming and operations when Institute policies were changing on a weekly, if not daily basis. The Learning Assistant, IMPRESS and Inclusive Excellence initiatives transformed to support faculty and staff in the new educational settings. CASTLE activities, workshops, seminars and brown-bag lunches were regularly well-attended, a testimony to the effective virtual marketing strategies that were developed and refined on-the-fly. Faculty developed new ways to collaborate with each other and their research students, and the DBER REU program is particularly noteworthy for the sense of community it fostered in a purely virtual experience.

Throughout, the CASTLE community persisted. SMERC journal clubs and research groups continued without missing a beat, and the weekly gatherings gave rise to new research projects, papers and grants. New faculty and staff joined the community, and we eagerly anticipate finally joining these new colleagues in person instead of behind a Zoom screen.

It has not been an easy year, and, yet, we found ways to continue the work that makes our Center special. For that, and for all the work you have done, I am very grateful.

Thank you.

A handwritten signature in black ink, appearing to read "Scott Franklin".

Mission Statement

The Center for Advancing STEM Teaching, Learning and Evaluation fosters rigorous, discipline-based STEM education research, providing infrastructure and opportunities for interdisciplinary collaboration. It supports both foundational scholarship of discovery and scholarship of pedagogy, teaching and learning, including transformational educational practices. CASTLE seeks to broaden participation in science, technology, engineering, and math communities through outreach, research, and programmatic innovations.

Vision Statement

CASTLE strives to create a vibrant community of discipline-based STEM education researchers in Schools and Colleges across RIT, working together to address issues of critical regional and national importance. CASTLE seeks to model interdisciplinary collaboration, developing partnerships across the disciplines necessary to address complex issues of teaching, learning, and inclusion in today's educational landscape. Above all, CASTLE embodies the aspirations of the community, supporting each other in scholarship endeavors.

Diversity, Equity, and Inclusion (DEI) Statement

CASTLE builds continuous awareness and growth toward the practice of social justice, equity, inclusivity, anti-racism, and diversity into its programs and research initiatives. The Center endorses the path toward equal recognition of those historically marginalized in science, technology, engineering, and math, welcomes faculty and students from all backgrounds and cultures and offers opportunities for faculty, staff, and students to work together to build an equitable future for our campus and beyond.

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 undergraduate 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, math education, and science/math communication. Many of the members also study diversity and inclusion in STEM.

I. Photonics and Optics Workforce Education Research (POWER) Dr. Ben Zwickl and Dr. 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 is providing additional research-based clarity that informs national discussion and policy around STEM workforce preparation. Findings have highlighted the importance of cross occupational communication (rhetorical/situational flexibility with groups distinct in background, training, and occupational role) in the optics and photonics workforce and now a replication study is being conducted with EMPOWER data to validate whether or not views about competent communication varies by industry.

II. Molecular Biology Education Group (MBER)

Dr. Dina Newman and Dr. 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. This year's projects focused on visual literacy in molecular biology and developing tools to improve student learning outcomes. Highlights are listed below.

1. An REU project from the past two years comparing student and expert conceptions of the terms “gene” and “gene expression” provided new insight into why students struggle with molecular genetics concepts. The students presented this work with an award-winning poster at the 2020 NABT Professional Development Conference. A manuscript is now in press (Newman, Coakley, Link, Mills and Wright, *CBE LSE* 2021).
2. Another successful REU student project is in final revisions for publication. The manuscript describes a new activity with a model co-developed with the Center for Biomolecular Modeling to teach the molecular basis of crossing over in meiosis (Wright, Cortez, Franzen and Wright, *Biochemistry and Molecular Biology* 2021).
3. A card sorting task that uses 5 different types of DNA visualizations to demonstrate 4 different molecular processes has been disseminated widely to much acclaim (Newman and Wright, *ASMCUE* 2021; Newman, *Undergraduate Genetics Education Network workshop* 2021; Newman, *University of Tokyo Global Faculty Development workshop* 2020). A manuscript describing the activity is in preparation.
4. The MBER team continued their examination of visual representations by developing the “DNA Landscape” to describe and analyze images of DNA. Examination of numerous textbooks and primary literature has revealed interesting differences in how different subfields depict DNA (Wright and Newman, *ASMCUE* 2021). A manuscript is in preparation.
5. An REU student built on the DNA Landscape idea to develop a Protein Landscape, finding important differences between how concepts are illustrated in biology and biochemistry contexts. Work on this project will continue through the next academic year.
6. To continue the interactive video vignette project and improve on it, Newman and Wright submitted a \$300K IUSE grant proposal to NSF in collaboration with the BioQUEST Curriculum Consortium. The project will create a new suite of online open resources with a community of creators and users.

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) led the sixth cohort of participants 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). The Spring/Summer 2021 program session was led virtually with 11 students from around the country:

- Ella Bahr (Kansas State University)
- Grace Staes (Cornell University)
- Lydie Guercin (Emory University)
- Liliana Tinoco (Lewis University)
- Derek Dang (University of Alabama at Birmingham)
- Rebecca Verchimak (Coe College)
- Mark Flores (McDaniel College)
- Téa Pusey (University of California, Merced)
- Beck Tedeschi (New College of Florida)
- Matt Dunham (California State University)
- Emma Krofcheck (University of Pittsford)

We first established our multidisciplinary Discipline-Based Education Research (DBER) REU program at RIT in 2015 and have since mentored 6 cohorts of students (n=61, total). One of the great strengths of our REU is the multidisciplinary nature of the program; students interact with Biology, Chemistry, Physics and Math Education researchers and the students themselves come from a variety of STEM backgrounds. Due to the Covid-19 pandemic we ran our 2020 and 2021 programs using a virtual format. Regardless of implementation (in-person or virtual), our REU programs have been highly beneficial for participants and faculty mentors. Our REU alumni have gone on to graduate programs, have become Middle/High School science educators or have gone on to other STEM careers. Our program has enhanced the culture and prestige of STEM Education Research at RIT and has greatly advanced the research trajectories of the STEM Education Research faculty at our institution. In the past year REU students were coauthors on 5 conference presentations and 2 peer-reviewed papers, with 4 more in review.

IV. Graduate Admission and Retention Research Dr. Casey Miller

Former postdoc Lindsay Owens conducted interviews with 17 physics faculty from 4 institutions and focus groups with 54 graduate students from 23 institutions. Those interviews were analyzed for the ways in which faculty and students explained factors that cause graduate students to leave their PhD program. The analysis was assisted by DBER REU student Kelli Shar and has resulted in a manuscript “Exploring faculty and student perspectives on retention in physics graduate

programs: Student deficits versus sense of belonging” which is currently under review.

Mike Verostek, a graduate student from the University of Rochester and advised by Ben Zwickl, was supported by Dr. Miller’s NSF award 1633275 and 1834516. Mike’s quantitative analysis of admissions data (also mentioned under Zwickl Lab) resulted in a manuscript “Analyzing admissions metrics as predictors of graduate GPA and whether graduate GPA mediates PhD completion” which has been accepted to Physical Review Physics Education Research.

V. Franklin Physics Education Research Lab

Dr. Scott V. Franklin

Dr. Scott Franklin supervises a variety of physics education research projects. Current projects include novel statistical technique, including Markov chain and stochastic modeling, that better characterize students’ progression through their academic careers, qualitative research into students sense of how their careers “ought” to proceed, studying the interaction of student identities with the physics culture, and working with emerging education researchers to develop and refine effective research questions. [Read More](#)

VI. Zwickl Physics Education Research Lab

Dr. Ben Zwickl

The Zwickl PER Group has been very active in quantum education and PER over the past year. Dr. Ben Zwickl was a Co-PI and lead of Education and Workforce Development for RIT’s Quantum Leap Challenge Institute Conceptualization grant for a Quantum Photonic Institute (PI Don Figer, Future Photon Initiative). Ben collaborated with Heather Lewandowski and Michael Fox at CU-Boulder to study workforce needs in the quantum industry, which was published in [Physical Review PER](#) and received attention from [APS Research News](#) and [Communications of the ACM](#). Ben also participated in the Kavli Quantum Smart Workforce meeting at UCLA in November 2019 and co-authored part of the report on [Achieving a Quantum Smart Workforce](#), published in the journal Quantum Science and Technology. Ben also co-organized and chaired a Focus Session at the 2021 American Physical Society March Meeting in conjunction with the APS Division on Quantum Information entitled “Teaching Quantum Information at All Levels” and is organizing a similar session for the 2022 APS March meeting as well. Locally at RIT, Ben is leading the development of a new minor in Quantum Information Science and Technology.

In March 2020, at the start of the coronavirus shutdown, Dr. Dina Zohrabi Alaei joined the Zwickl Lab as a postdoc on Ben’s NSF CAREER Award studying Learning in Context-Rich Environments. Dina recently completed her PhD in Physics at Kansas State University under Ellie Sayre and has made an immediate impact. She planned and carried out a large multi-week study of physics majors participating in remote NSF-funded REU programs, which is a model both for the depth of data

collected, but also in a unique environment forced by coronavirus. Dina conducted weekly interviews (94 in all) covering all aspects of the research experience, including how students approach learning within the REU, their mentoring and social network, and the impact of the experience on their career plans. Dina has developed a new model of how undergraduate research experiences develop students' sense-of-belonging, identity, and career decision-making. A conference proceeding analyzing the experience of one student has been accepted and a longer paper is currently under review.

During most of the 2020-21 academic year, graduate student Mike Verostek conducted new analyses of graduate admissions metrics as predictors of graduate GPA and whether graduate GPA mediated PhD completion. An analysis of 1,955 physics graduate students from 19 PhD programs shows that undergraduate grade point average predicts graduate grades and PhD completion more effectively than GRE scores. Students' undergraduate GPA (UGPA) and GRE Physics (GRE-P) scores are small but statistically significant predictors of graduate course grades, while GRE quantitative and GRE verbal scores are not. We also find that males and females score equally well in their graduate coursework despite a statistically significant 18 percentile point gap in median GRE-P scores between genders. Overall the results indicate that among commonly used quantitative admissions metrics, UGPA offers the most insight into two important measures of graduate school success, while posing fewer concerns for equitable admissions practices. The paper is currently available on the [arXiv](#), but will be appearing in published form in late August 2021. At the 2021 Physics Education Research Conference, four researchers from the Zwickl lab presented their work: Dina Zohrabi Alaei (postdoc), Mike Verostek (graduate student), Pedro Cardona (capstone student), and Molly Griston (2020 DBER REU student). During the summer of 2021, six undergraduate researchers worked with the Zwickl Lab on various projects including quantitative analyses of time-to-completion, computational literacy in science courses, analysis of physics majors' career decision-making, and help-seeking behaviors and career support of undergraduate STEM majors.

VII. Reformed Experimental Activities (REActivities)

Principal Investigator: Christina Goudreau Collison, Dina Newman, Douglas Tusch, Jeremy Cody

Dr. Tina Goudreau Collison leads a collaborative effort focused on a reformed chemistry curriculum for teaching undergraduate organic chemistry laboratories using a guided inquiry approach. Reformed Experimental Activities (REActivities) incorporates inclusivity, continuity, and engaged student learning in early chemistry experiences. [Read More](#).

REActivities website: www.reactivities.org

YouTube channel: <https://www.youtube.com/c/REActivities>

Facebook Page: <https://www.facebook.com/groups/1685322984913199>

Amazon: https://www.amazon.com/REActivities-Organic-Chemistry-Workbook-shrinkwrapped/dp/159399642X/ref=sr_1_1?dchild=1&keywords=reactivities+goudreau+collison&qid=1611154380&sr=8-1

Paper Published: Kaitlyn Clark, Asma Sheikh, Jennifer Swartzenberg, Ashley Gleason, Cody Cummings, Jonathan Dominguez, Michelle Mailhot, and Christina Goudreau Collison*

Sign Language Incorporation in Chemistry Education (SLICE): Building a Lexicon to Support the Understanding of Organic Chemistry

J. Chem. Educ. **2021**, XXXX, XXX, XXX-XXX

Publication Date: February 9, 2021

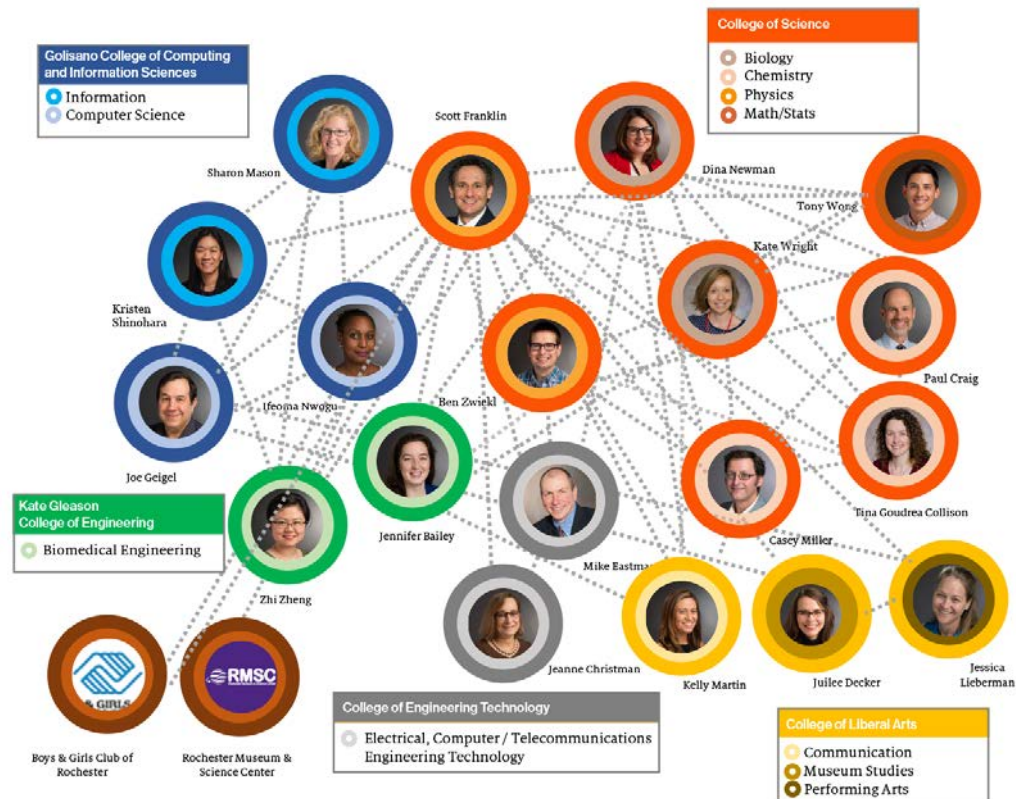
<https://doi.org/10.1021/acs.jchemed.oco1368>

RESEARCH ACTIVITIES

I. Institute for Research in STEM Education (IRiSE) Connecting | Building Community Across Campus and Beyond

Institute for Research in STEM Education (IRiSE)
Connecting | Building Community Across Campus and Beyond

A network of cross-campus faculty spanning RIT colleges and disciplines doing DBER education research. All are affiliated with the Center for Advancing STEM Teaching, Learning and Evaluation (CASTLE).



RIT

In February of 2018, CASTLE, along with College of Engineering Technology formed an interdisciplinary collaboration forum. Under the direction of the College of Engineering Technology (CET) Associate Dean Dr. Mike Eastman and CASTLE faculty Drs. Dina Newman and Ben Zwickl, STEM education research groups across campus met to present, share ideas, and further common research goals. Within just two years the campus-wide scholarship community grew, 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. The group also worked to support efforts in graduate education, e.g. the School of Physics and Astronomy's Ph.D. in physics.

During the academic year of 2020-21, grant proposal partnership grew to include key Rochester area educational institutions. Faculty from RIT's MAGIC Spells Studios, College of Liberal Arts, and Golisano College of Computing and Information Sciences partnered with the Rochester Museum & Science Center and Boys and Girls Club of Rochester on *Creating a Community, Academic and Museum Partnership for Informal STEM Learning Through Augmented Reality and Storytelling*, an NSF proposal for informal STEM learning centered around the 2024 eclipse. RIT math, biology, and physics faculty joined College of Science administration to propose *Integrating Stochastic Modeling and Real-time Experience Sampling Into Institutional Decision Making to Promote Student Success*, developing sophisticated new data collection and statistical analyses. COS and COLA faculty are collaborating on a new project researching ethical considerations and affordances STEM researchers (DBER and more traditionally disciplinary) bring to their research.

RIT Campus and Area Partnering Associations 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
- MAGIC Spell Studios
- Rochester Museum & Science Center
- Boys & Girls Club of Rochester

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, especially faculty interested in incorporating research-based methods and assessment into their classrooms. Twenty-eight sessions were held in the AY2020-2021. Run by Dina Zohrabi Alaei, readings were selected by the group of regular attendees and came from a variety of discipline areas (life sciences, chemistry, engineering, computer science, physics, social sciences) and journals. Typically, the discussion was facilitated by whoever suggested the article. The articles were announced weekly via a listserv with 65 members, and 7-10 people attended on a typical week.

III. SMERC Seminar Speaker Series

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

In AY 2020-21, SMERC hosted four guest seminar speakers. All seminars were held virtually; three of the four were collaboratively hosted, demonstrating cross-disciplinary interest. Topics ranged from research on pedagogy, cultural impacts on learning, to evaluation of learning outcomes and student experiences. All COS faculty, staff and students were welcome to attend the seminars and workshops.

SMERC 2020-21 Seminar Speakers



Dr. Benjamin Pollard

Postdoctoral Researcher
University of Colorado, Boulder
October 14, 2020, 1:25-2:15 p.m.

*MAPLE, The Modeling Assessment for Physics
Laboratory Experiments*

**Co-hosted by Science and Math Education
Research Collaborative and School of Physics
and Astronomy**



Dr. Adan Vela

Assistant Professor
University of Central Florida
November 30, 2020, 1:30-2:30 p.m.

*The Challenge of Estimating Graduation Rates for Small
Cohorts*

**Hosted by Science and Math Education
Research Collaborative**



Dr. M. Elizabeth Barnes

Assistant Professor
Middle Tennessee State University
February 24, 2021, 1:25-2:15 p.m.

*Using Religious Cultural Competence in Evolution
(ReCCEE)*

**Co-hosted by Science and Math Education Research
Collaborative and Thomas H. Gosnell School of
Life Sciences**



Dr. Andrea A. diSessa

Corey Professor Emeritus of Education

University of California at Berkeley
May 5, 2021, 1:30-2:30 p.m.

Computational Literacy: The Very Idea

**Co-hosted by Science and Math Education
Research Collaborative, School of Physics and
Astronomy, and School of Mathematical Sciences**

FLAGSHIP PROGRAMS

I. Inclusive Excellence – 2020-2021: A Year of COVID

One of the pillars of the Inclusive Excellence Initiative at RIT is the sense of community we build through our activities. The move to the online format affected the way in which community was built in one of our primary activities, the faculty cohorts. The experience of finishing the faculty cohorts in spring of 2020 via zoom demonstrated that the online environment would be a barrier for engagement, trust building, and ultimately community. We decided, therefore, to pause the offering of the faculty cohorts for Y4.

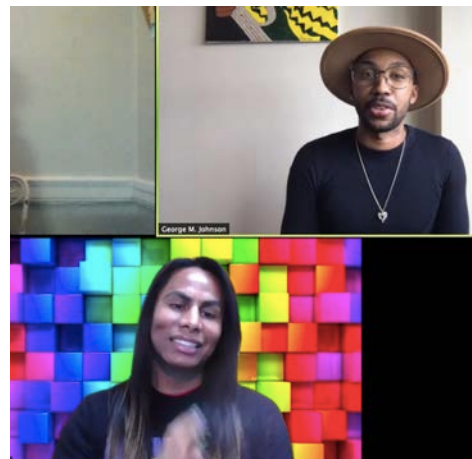
Another change in Y4 of the grant was the addition of a program coordinator. Concentrating the work on one person allowed for a more holistic view of the program, which translated in the modification of the Y4 format to adapt it to the needs of a COVID year, expansion of activities, fostering of collaborations, and the maturation of the sustainability plans for the future of the initiative.

Our Offerings & Activities

Despite all the changes that were necessary, we attempted to provide a sense of continuity too, by offering other activities that the College of Science (COS) has come to expect. We presented seven seminars during the college activity hour, with topics such as inclusive syllabi, student mental health, and the hidden curriculum. We reported the results of the staff survey, and from that session realized it was time to deploy the surveys again. These surveys, developed by the team, based on the available literature, were modified after receiving feedback from several groups, and are ready to deploy in Fall 2021.



Earlier than usual, we invited once again a distinguished speaker to our campus. Though virtual, Discussions with George M. Johnson was a raging success, engaging faculty, staff, and students from the entire RIT community. These events require fundraising and engage several community partners in guaranteeing its success. IE also partners with the RIT community for other such events, as was the case with the virtual talk given by Minda Harts, at the invitation of the Division of Diversity and Inclusion.

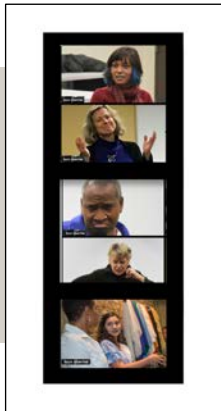


Given the absence of the faculty cohorts, and the need to provide opportunities for engagement and learning of topics of inclusion, the program expanded to include a Brown Bag Inclusion Conversations Series. Less formal than the seminars, the aim of this series was to bring to light inclusion topics of relevance for our community and to create another space for discussion and learning, for sharing and support. We offered seven different topics, including Black in STEM, Environmental Justice, and Food Insecurity. Several of the topics were offered in collaboration with partners from the RIT community, such as the FoodShare (Student Affairs), Title IX, Advance/RIT, and Women in Science (WISe).

Another source of collaboration was RIT's Counseling and Psychological Services (CaPS), through Jaime Castillo, a mental health therapist who is housed in COS. Together we ran a Listening Circle on Mental Health with students, for which we developed a survey. From the analysis of that survey we created a seminar to elevate the results and the conversation to the entire college.

We were also required to change the format of our Playback Theatre offerings, originally conceived as a cohort that unites faculty, staff, and students through live theater-based sessions. We wanted, nonetheless, to provide this unique platform for engagement, given how impactful it can be. We offered 3 separate workshops

throughout the summer/fall of 2020, and are in the process of reevaluating the aim and scope of this form of engagement.



Finally, we developed a series of documents about best practices, shared both stand-alone and as part of the seminars we conducted. We recognize the importance of providing information that participants can either take with them or access outside of workshops. To that effect, we have started a repository for the information we collate and develop for our activities, to facilitate engagement and access to information on topics of social justice, equity, and inclusion.



Despite the constraints of virtual gatherings, the Inclusive Excellence initiative held book discussions, lunchtime chats, Playback Theatre workshops, and current event sharing and debriefs. The Black Lives Matter Movement continued to have a strong presence world-wide.



Full list of Activities/Offerings

Seminars: 7

- Adapting Course-Based Research to Virtual Learning Environments to Make STEM Education Accessible to All Students (invited speaker Dr. Franco Delogu, Lawrence Tech)
- IE Staff Survey Results Discussion
- The Hidden Curriculum
- Inclusive Mentoring Practices
- Inclusive Classroom Practices: Keys to Success
- COS Student Mental Health: Survey Report and Discussion (with Jaime)
- How Inclusion is Communicated (or not) Through the Course Syllabus
-

Brown Bag Inclusion Conversations: 7

- Food Insecurity (with Sharon Kompalla-Porter)
- Environmental Justice
- Picture a Scientist (with ADVANCE/RIT and WISE)
- The Accusation: Unpacking Perceptions and Realities of the Title IX Process at RIT (with Title IX office)
- Black in STEM
- How Have You Contributed to Inclusion and Belonging This Year?
- 21-Day Racial Equity Challenge Debrief

Invited Guest Speakers: 2

- George M. Johnson (Award-winning journalist, consultant, activist)
- Minda Harts (Best-selling author, workplace and equity consultant; with DDI)

Playback Theatre: 3

- Shared Holiday Experiences: Stories of Inclusion, Exclusion, Cultural Awareness, and Traditions
- Community Building During Physical Distancing
- Community Understanding and Healing: Stories of Discrimination and Progress

Listening Circle with students: 1 (on Mental Health, with Jaime Castillo, Nov 11 2020)

Collaborations: 6

- CaPS (Jaime Castillo)
- ADVANCE/RIT (Betsy Dell)
- WISe
- DDI (Stephanie Paredes)
- Title IX (Stacey DeRoy and Darci Lane)
- FoodShare (Sharon Kompalla-Porter)

Handouts: 10

- What's in a name? (issues relating to dead names, changing it on SIS, etc.)
- Inclusive Syllabi
- The Hidden Curriculum
- Inclusive Mentoring Practices
- Quick Guide to Accessible Materials
- Classroom Response Systems
- Coping strategies identified by COS students in the Mental Health Survey
- Day 1: Welcome to the First Day of the Semester – Classroom Practice edition
- Day 1: Welcome to the First Day of the Semester – Research Mentoring edition
- Being Inclusive Online – Blog posts (3) in collaboration with TLS/Rebecca Johnson (<https://www.rit.edu/academicaffairs/tls/blog>)

Collaborations

For the first three years of the grant, the IE initiative sought to bring in the expertise of several collaborators from across the RIT campus into our activities (Q center, NTID, Residence Life, ITS, etc.), primarily as invited facilitators for the Faculty Cohort Workshops and with Diversity Theatre (DDI). And while some of these collaborators were recurring, we would consider most of them visiting collaborations. The first embedded collaboration was with DDI, through Diversity theatre and by the continuous presence of a DDI person in our Advisory Council. In year 4 we sought to expand the types and the scope of our collaborations, by connecting with other people and spaces within RIT in a truer collaborative manner.

These collaborations, listed below, led to co-organizing events, co-writing articles, and planning/discussion of how the IE model can be expanded beyond COS.

In Y4 we were able to generate two peer-reviewed papers from the work accomplished with the faculty cohorts, published one article, and presented the IE work at several regional and national venues and conferences.

- 2 peer-reviewed papers published:
 - Wyatt, B. N., de Magalhães, R. M., Michel, L. V., & Newman, D. L. (2021). Development of a Faculty Learning Community to Foster Inclusive Research Mentoring. *Journal of Faculty Development*, 35(2), pp. 44-49.
 - Magalhães, R. M. & Hane, E. N. (2020). Building Inclusive Classroom Practices: A Curriculum for Faculty Learning Communities Based on Metacognition. *Journal of Faculty Development*, 34(3), pp. 124 - 131.
- 1 magazine article published:
 - Chapman DaCosta, T. Sharing Our Stories are Important During Physical Distancing and Protests. *Insight Into Diversity*, July/August 2020
- 6 presentations:
 - Niagara University Invited Talk, Jan 13 2021 (Inclusive Syllabi)
 - Massachusetts PKAL, Jan 7 2021 (Playback Theatre)
 - AAC&U STEM Conference, Nov 6-7 2020 (1 talk on Playback Theatre, 3 posters on Inclusive Syllabi, Faculty Perceptions of Inclusive Classroom Practices, and Classroom Practice Cohort Curriculum)

We recognize that while individual change has its own difficulties, enacting broad culture change at the institution level can be a much more involved and lengthy process. Over the course of the last four years the work that has been done in COS, involving over 60% of the faculty and 70% of the staff, places COS in the “early majority” category of change, where we consider that initiatives on DEI are coordinated and inspired by IE (see figure). Y4 saw the Dean continue to take ownership over DEI work by adding 2 questions on DEI to the student evaluation system (S-RATE) and by agreeing to transfer the responsibility of this work onto the Dean’s office, in the form of embedding the Program Coordinator at the end of the grant.

Looking to the future - Y5

With the specter of COVID mostly behind us, the plan for the last year of the grant is to resume some of the activities that were suspended in Y4. As such, we will have recruited faculty, both incoming and veterans, to participate in the Research Mentoring and the Classroom Practice cohorts. Playback Theatre will play a different role in Y5, pivoting from a traditional cohort to faculty and staff training on DEI, and moving those activities into the College while providing a more context-dependent training.

We will continue to provide those in COS with opportunities to engage in DEI work through seminars and brown bag conversations, enlisting the participation of previous and new partners across the institution. Through the work of the Advisory Council, IE will also continue its efforts in both increased participation in DEI work and moving COS closer to final stages of culture change.

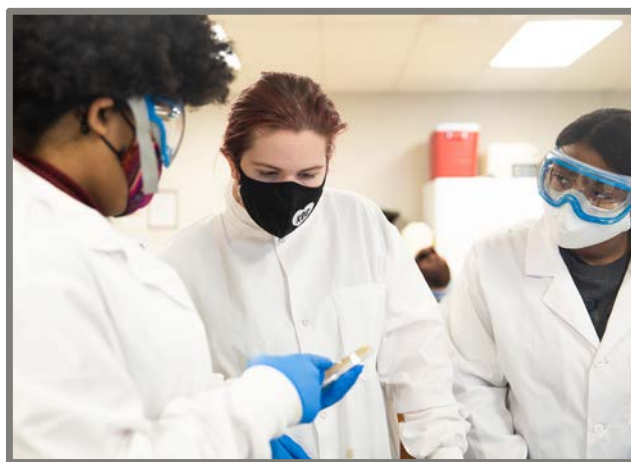
This program is supported in part by a grant to RIT from the Howard Hughes Medical Institute through the Science Education Program.

[Read More](#)

[Watch the Video](#)

Learning Assistant (LA) Program

<https://www.rit.edu/castle/programs/learning-assistants/overview>



Learning Assistant Alea Wrightstone interacting with class participants in Biochemistry (left); Vanessa Baker (center in photo) interacting with Introduction to Biology students within small group lab discussion (right).

The **Learning Assistant (LA) Program** is a leader among national LA Programs across the country. This year, more RIT schools assumed a greater share of the cost of the program, showing a clear commitment and appreciation of the benefits to faculty and students alike. Despite the schools' assuming more of the cost, the College of Science saw an increased number of learning assistants. Courses transitioned to online and blended classroom models, with help from the LAs in designing course delivery using multiple modalities. Despite the challenge of navigating a virtual means of connecting, student LAs continued to support the goals of their faculty mentors through peer-to-peer small group facilitation and resourceful ways of connecting one-on-one. Active learning materials and out-of-class peer-learning sessions continued as in years past. LAs utilized skills and

training, gained from the pedagogy class, that allowed them to reflect on classroom learning, make meaning from that reflection, and provide insight and ideas to work collaboratively with faculty to improve outcomes. In this way the program is uniquely different from traditional classroom support.



Orientations and end of semester wrap-ups were held virtually.

During this academic year, 80 learning assistant positions were filled, preparing them to assist in classroom instruction, peer-to-peer problem solving, and strengthen leadership skills while articulating and defending their ideas. These LAs supported campus-wide classes in the Gosnell School of Life Sciences, School of Mathematical Sciences, School of Chemistry and Materials Science, School of Physics and Astronomy, National Technical Institute for the Deaf (both American Sign Language and Interpreting Education and Cultural and Creative Studies), Electrical Engineering Technology, and Mechanical Engineering Technology. Through this process, LAs gained self-confidence utilizing this vehicle as a way to practice professionalism in the work place.



More than 80 Learning Assistants supported campus-wide classes in AY 2020-21.

Program Coordinator, Dr. Emily Mehlman led a team of seven cross-campus talented and dedicated faculty, the Learning Assistant Program Committee, with new members joining each year. The Committee focused on continuing to build a stronger and more inclusive program for students while supporting teaching goals of classroom faculty mentors.

As the program has grown, some students were LAs in more than one classroom, just as some faculty mentored LAs in two, three or four classrooms. For courses with a larger number of students (>100), two or more LAs were assigned.

During the Fall Semester 2020, the program had 39 learning assistants working with 29 faculty mentors in the four College of Science schools (GSoLS, SCMS, SMS, and SoPA), and 2 College of Engineering & Technology (Manufacturing & Mechanical Engineering Technology, Electrical Engineering Technology). The American Sign Language and Interpreting Education department and Performing Arts Department within NTID (National Institute for the Deaf) also had LAs and mentors in Fall Semester 2020.

During the spring semester of 2021, the mentors and LAs persevered with the challenges of virtual classroom connections and Zoom fatigue. There were 39 learning assistants working with 26 faculty mentors within the same College of Science schools. Additionally, 6 learning assistants were placed in the Interpreting Department of NTID, adding new NTID faculty to the program. We were pleased to welcome a faculty member from the School of Mathematical Sciences during this semester as well.

The pedagogy course, an important component of the LA Program, was taught both semesters by program coordinator, Emily Mehlman, and provided training to 39 students (21 fall, 18 spring) focusing on helping practice facilitating small group discussion, carrying out pedagogical research, and supporting student engagement in the classroom through active learning. The program provided a resource to help faculty implement and sustain pedagogical change in their classrooms, while LAs gained experience teaching, to assess whether this is something they may be interested in pursuing as a career.

The image displays three promotional posters for the Learning Assistant Pedagogy Brown Bag Series. Each poster features a central illustration of a brown paper bag with a pencil and a book. The posters are arranged horizontally and contain the following information:

- Poster 1 (Left):** Titled "Brown Bag #1 Classroom Culture" on February 18, 2021, from 12-1 p.m. The text asks, "How does your classroom culture impact learning? How can a Learning Assistant impact classroom culture? Join your fellow Learning Assistants and Mentors for a lunch-hour conversation about classroom culture. Discuss ways to create an inclusive space and transform with your LA/Mentor partner on how to actualize these ideas in your classes." It includes a "Register Today!" button and the RIT logo.
- Poster 2 (Middle):** Titled "Brown Bag #2 Student Motivation" on March 17, 2021, from 12-1 p.m. The text asks, "We made it to mid-semester! Starting to feel a bit tired? Feeling a bit less motivated? Have you tried any of these things in your classes? Join your fellow Learning Assistants and Mentors for a lunch-hour conversation about student motivation. Learn ways to help students stay motivated and to align them with your LA/Mentor partner on how to actualize these ideas in your classes." It includes a "Register Today!" button and the RIT logo.
- Poster 3 (Right):** Titled "Brown Bag #3 Formative Classroom Assessment" on April 15, 2021, from 10-11 a.m. The text asks, "How are students doing? How can you gauge where students are at without just relying on homework quizzes? The answer is... Formative Assessment! Join your fellow Learning Assistants and Mentors for a lunch-hour conversation about formative classroom assessment techniques. Discuss different forms of assessment and collaborate with your LA/Mentor partner on how to actualize these ideas in your classes." It includes a "Register Today!" button and the RIT logo.

A pilot test of an LA Pedagogy Brown Bag Series ran for 3 sessions. These lunchtime discussions were available virtually for current student LAs and faculty mentors. Topics included Classroom Culture, Student Motivation and Formative Classroom Assessment. Links to reading materials were given ahead of time to enrich the discussions. Each discussion began with a short presentation by the LA program coordinator, followed by discussions and shared experiences. These sessions were attended by a mix of both faculty and student learning assistants.

A special zoom meeting was held for all faculty and students interested in learning about the benefits of the Learning Assistant Alliance, providing links to helpful resources for those even considering joining the program. Both current and prospective faculty attended this session.

Two recruitment fairs were held (virtually in both the fall and the spring) to inform interested mentors and students on the Learning Assistant Program and provide them an opportunity to speak with past and current LAs and mentors about their experiences. In spring, the fair included an interactive session using the virtual engagement platform gather.town wherein individuals can visit a virtual space and chat with each other via avatars. This allowed for more socialization and informal conversation despite the challenges of a virtual environment.

A virtual symposium was held prior to the close of the spring semester in which a group of learning assistants participated in presenting their posters derived from their pedagogy course understanding and findings. The poster session was held in gather.town, where viewers can walk up to the posters, discuss with the creator and others in a virtual space. Following the poster session, a symposium was held whereby awards and certificates were given to those learning assistants of high integrity and dedication to the program, recognizing their outstanding contributions. Due to the outstanding performance of the learning assistants throughout the pandemic year, three additional awards were created to recognize these students performance. These awards recognized an Outstanding Veteran Learning Assistant, an Outstanding First Time Learning Assistant, and an Outstanding Senior Learning Assistant in addition to our previous award, the Learning Assistant Program Recognition of Excellence.

The LA Program [website](#) remains updated with clear and precise information for both student LAs and faculty mentors. An [Additional Resources Page](#) on the Faculty Mentor Information section of the website continues to provide publications, podcasts, videos and website links as resources to support student learning assistants, faculty working with LAs, or anyone interested in learning more about the LA Program or related pedagogies.

2020–21 Undergraduate Learning Assistants:

Nana Aikins, Evan Altieri, Vanessa Baker, Kelsey Beers, Jojo Bensa, Gage Blackwell, Brandon Bogner, Anton Bogovik, Haven Chady, Collen Cole, Victoria Covell, Lacey Dallum, Steven Dang, Aniya DeBride, Daniel DiMartino, Erika Doroshenko, Timothy Forst, Ian Freezman, Austin Frey, Zachary Gazzillo, Nadia Gunderson, Eugene Ham,

Brianna Hicken, Dennis Houlihan, Seth Jones, Maha Khokhar, Jordan Kiel, Elizabeth Knisley, Ashley Lasko, Jonathan Lutzer, Emily Mahoney, Olivia Martin, Ashley Martsen, Jessica McNeely, Celia Mercovich, Nadia Moore, Anna Neuenschwander, Nikolas Nguyen, Katherine O’Neill-Knasick, Kristen Patten, Samara Patterson, Lexi Pyke, Matthew Race, Irtaza Razvi, Makayla Reed, Brayden Renslow, Molly Roesch, Jack Ryan, Lauren Sabatino, Benjamin Sander, Julia Steele, Joseph Testa, Nasheett Usman, Dominick Velez, Gabriel von Kessel, Abigail Von Plinsky, Jacob Was, Peter Wengert, Andrew Weston, Alea Wrightstone, Emalee Wrightstone, Kelsey Zelaya

2020–21 Learning Assistant Mentors:

Alla Bailey, Dawn Carter, Michelle Chabot, Tony Chirico, Steven Ciccarelli, Matt Copenbarger, Mary-Anne Courtney, Paul Craig, Elizabeth DiCesare, Kristina Driscoll, Andrew Ferrante, Scott Franklin, Michael Gleghorn, Josh Green, Ed Hach, Kathleen Holcombe, Marc Holland, Jeyhan Kartaltepe, Geo Kartheiser, Prema Kumar, Joseph Lanzafame, Jason Listman, Charlie Lusignan, Louis McLane, Samantha Moore, Shahla Nasserar, Dina Newman, Sheth Nyibule, Suzanne O’Handley, Mark Olles, Shima Parsa, Michael Pierce, Lisa Prinzi, Michael Savka, Hyla Sweet, Greg Trayling, Ben Zwickl



**Learning Assistant Program
Recruitment Fair for Fall Semester**

All Faculty and Students are Welcome!

Friday, April 2, 10–11:30 a.m.

10-11 a.m. Info session and LA student panel Q&A
11-11:30 a.m. Virtual informal mingle sessions with faculty

Learn how the program provides teaching and leadership skills, while supporting the teaching goals of faculty mentors.

- Learn how LAs support virtual and in-person classrooms
- Review the application process
- Hear from LAs about their peer-to-peer small group facilitation
- Enter virtual breakout rooms to chat informally with faculty

**Students receive up to \$1,875 per semester
No minimum GPA requirement**

Questions? Contact Emily Mehlman at ekmsps@rit.edu
To request interpreting services visit myaccess.rit.edu

Register For Link



The LA Program hosted two recruitment fairs, one in the Fall semester (November 13, 2020) and one in the Spring semester (April 2, 2021)—both held virtually, video recorded, captioned and posted to the CASTLE website.

Both recruitment fairs started with a presentation by program coordinator, Emily Mehlman, providing details on the program, including expectations and commitments. After a Q & A session a student panel of current learning assistants spoke about their experiences and the benefits of the program.

Learning Assistant Program Faculty Committee Members:

The AY 2020-21 brought new faculty members to the organizing committee from areas of the College of Science, and National Technical Institute for the Deaf (NTID). Committee members consisted of the following:

- Emily Mehlman (CASTLE LA Program Coordinator)
- Scott Franklin (School of Physics and Astronomy)
- Dawn Carter (Thomas H. Gosnell School of Life Sciences)
- Liz Bremer (Office for Diversity and Inclusion)
- Nate Barlow (School of Mathematical Sciences)
- Andrew Ferrante (School of Physics and Astronomy)
- Daniel Maffia (Department of ASL and Interpreting Education, National Technical Institute for the Deaf)

IMPRESS PROGRAM | ACCESS NETWORK



Metacognition classes engaging in self-reflection and small group discussion.

Integrating Metacognitive Practices and Research to Ensure Student Success (IMPRESS) incorporates metacognition into the study of science, technology, engineering and mathematics (STEM) studies. It is based on the awareness and understanding of one's own thought process.

In the past, the IMPRESS program has consisted of a summer bridge program for pre-freshman and a course in metacognition for first year students (ITDS 150: Metacognitive approaches to scientific inquiry). The IMPRESS program has adapted to changing funding sources and now consists of the first year metacognition course (two sections offered in fall) and a student run social group called Get Meta! (founded by 4 veteran IMPRESS students in Spring 2021). In fall 2020, two sections of the metacognition course were taught by Dr. Emily Mehlman in an entirely virtual platform, enabling multiple students in each class to participate virtually from locations outside of Rochester (44 students total; one section of 20 and one of 24 students). IMPRESS continues to evolve and expand its programming to meet the needs of RIT and its students with plans to increase the number of sections offered in order to support a College of Science-wide cohort building experience.

Summer 2021, for the first time, offered a course through the First Class Academy (FCA) entitled *Thinking About Thinking About Science: Metacognition*, which allowed 27 pre-freshman students to examine their own learning through written self-reflection, active learning during synchronous zoom meetings, and investigation of different perspectives through collaborative analysis of case studies—while fulfilling the ethical perspective requirement or a general education elective of 3 credits. The course was taught by Drs. Emily Mehlman and Rita Margarida Magalhães.



The new student group Get Meta! was founded by 4 veteran IMPRESS students with the hopes of spreading metacognitive skills and ideas throughout RIT. They also hope to provide networking opportunities and host socials to bring together students from across disciplines and colleges. Anyone can join the Get Meta! group, not just IMPRESS associated students. Already in spring 2021, even prior to official as a student group, these students hosted informal socials to recruit members to Get Meta! and share their passion for metacognition. Fall plans that have already been discussed include more socials such as a start of the year RIT campus scavenger hunt, off-campus “field trips” to Rochester venues such as The Memorial Art Gallery, and a fundraiser. This group is advised by Dr. Emily Mehlman, IMPRESS Coordinator.

IMPRESS is part of the Access Network, which consists of nine university-based programs co-working with graduate and undergraduate students across the country towards a vision of a more diverse, equitable, inclusive, and accessible STEM community. The core values of the network align with the IMPRESS program giving students a voice and ownership in their education, while providing authentic science practices and professional development. Between 4 and 6 IMPRESS students are selected for fellowships with the Access Network each year. Two main fellowship roles are offered: Assembly Fellows and Network Fellows. 1-2 Assembly fellows are selected from the RIT IMPRESS cohort per year. Assembly Fellows (AFs) collaborate with other AFs from Access sites across the country to plan and put on a springtime event called the Access Network Assembly. At the Assembly, fellows and affiliates of Access gather to network, share resources, engage in education about diversity, equity, inclusion, and social justice, and collaborate to support the success of individual Access site programs, such as IMPRESS. The AF role is a unique opportunity for students to gain experience in networking, collaboration, professional development, and planning a professional event similar to a conference. In 2021, the Assembly was held virtually allowing these fellows the opportunity to reinvent prior year sessions for a virtual platform and incorporate attendees from a wider range of sites without consideration for travel costs. The AF from RIT for 2020 and 2021 was Mikayla Bulson.

In addition to the AF role, 2-4 Network Fellows (NFs) are also selected from the cohort of RIT IMPRESS students each year. NFs meet on bi-monthly video conference calls with other NFs from Access sites across the country to network, share resources, and support both the Access Network as a whole and the programs of individual sites. In past years, NFs would travel to other Access sites, but with COVID preventing safe inter-site travel, NFs developed novel ways to interact including hosting network wide virtual socials, establishing an Access newsletter, crafting blog posts on the Access Network website, establishing an Alumni database, and more. In January 2021, a cohort of NFs planned and hosted a virtual workshop on the practice of grant writing. This multi-day virtual workshop served to inform undergraduate and graduate students on the process of grant writing with the overall goal of demystifying how science is funded. The 2020 NFs were Kylie Johnson and Sydale John Ayi. The NF for 2021 was Merone Delnesa. These cohorts of NFs were mentored by Dr. Emily Mehlman (a Core Organizer [CO] of Access and the IMPRESS Coordinator at RIT) along with two other non-RIT Access COs.

During the COVID-19 pandemic, members of the Access Network noticed an increased and disproportionate financial, emotional, and social impact on AALANA students. To address this need, the Network established an emergency fund based on direct giving. The emergency fund ran for a total of 7 cycles and redistributed more than \$33,000.00 to 40 unique individuals. The fund was intentionally guided by a set of Network defined principles to ensure equitable disbursement of funds. Reasons given for requesting financial support from the fund included paying for basic life needs (food, rent, etc), tuition, home mortgages due to parental loss of jobs, and medical bills/funeral costs. Dr. Emily Mehlman and Dr. Scott Franklin worked

with a subset of Access Network leaders to collaboratively run the emergency fund. The Network is currently in discussion over the future of the emergency fund as it is currently inactive.

Over the past year, the Access Network has submitted two grants to the NSF soliciting further funding for the organization. One of these grants was funded to support the continuation of Network activities such as the mentoring of AF and NFs and the execution of the annual Assembly. Efforts are currently underway to seek additional funding to expand the Network and incorporate new sites, with a focus on Minority Serving Institutions. Dr. Emily Mehlman and Dr. Scott Franklin participate in grant preparation and general support of the Network as a whole.

As the IMPRESS program grows and evolves at RIT, more opportunities for RIT students to get involved with the Access Network will be made available. Inter-site travel will once again be safely possible and with a larger cohort of IMPRESS students, more RIT students will have the opportunity to network with other visiting NFs from Access. Pending funding, the Network will continue to grow and incorporate new sites, adding additional networking opportunities for RIT students.

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. Unfortunately, during the summer of 2020 the program was cancelled due to the health risks posed by COVID-19.

In the past, this unique program has brought 36-40 rising eighth grade girls to RIT's campus from 10-12 different schools in the Rochester area. Almost half of the participants were awarded need-based scholarships. 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.

The experience always concludes 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)

<https://www.rit.edu/castle/programs/peer/about>

This year PEER offered virtual workshops, continuing to serve emerging education researchers interested in expanding their theoretical or methodological expertise, as well as senior faculty looking to transition from traditional disciplinary research into STEM education research.

A workshop was held with the University of Cologne (Germany) in March, 2021, and an extended series of workshops with math faculty kicked off in February, with three 2-hour cohort sessions following in May and June. The experience closed with a weekend meeting June 25-27.

A University of Manchester field-school is currently scheduled for Ambleside, UK in September, 2022.

PEER continues to expand, with the recent grant award for a field school in Kazakhstan awarded by the Embassy of the United States of America in Kazakhstan—American Council for International Education.

Scott Franklin, professor in the School of Physics and Astronomy and director of RIT's Center for Advancing STEM Teaching, Learning and Evaluation (CASTLE), received funding to help establish a PEER field school in Kazakhstan. The grant was awarded by the Embassy of the United States of America in Kazakhstan, by the American Council for International Education. Franklin and PEER co-director, Eleanor Sayre of Kansas State University, together with others in the program, will improve STEM faculty members' pedagogical knowledge in English and prepare STEM faculty to measure student learning and development.

The PEER program continues to have an international presence with workshops on research life, ethics, getting started with research design, analysis methods, research communication, teaching, and colloquium-style talks. [View available workshop topics here.](#)

PEER Publications and Presentations

A compiled list of publications and presentations by individuals across the PEER host sites is available showing individual and collaborative research. [View list here.](#)

PEER World Locations

Rochester, NY, USA

Cologne, Germany

Kibungo, Rwanda

Monterrey, Mexico

Vancouver, BC

Kazakhstan

FACULTY, STAFF AND POSTDOCTORAL RESEARCHERS Managing CASTLE Programs and Projects



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Senior Lecturer
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Matthew Sayre
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Associate Professor
Thomas H. Gosnell
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Benjamin Zwickl
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AFFILIATED PERSONNEL

Managing or Contributing to CASTLE Programs or Projects



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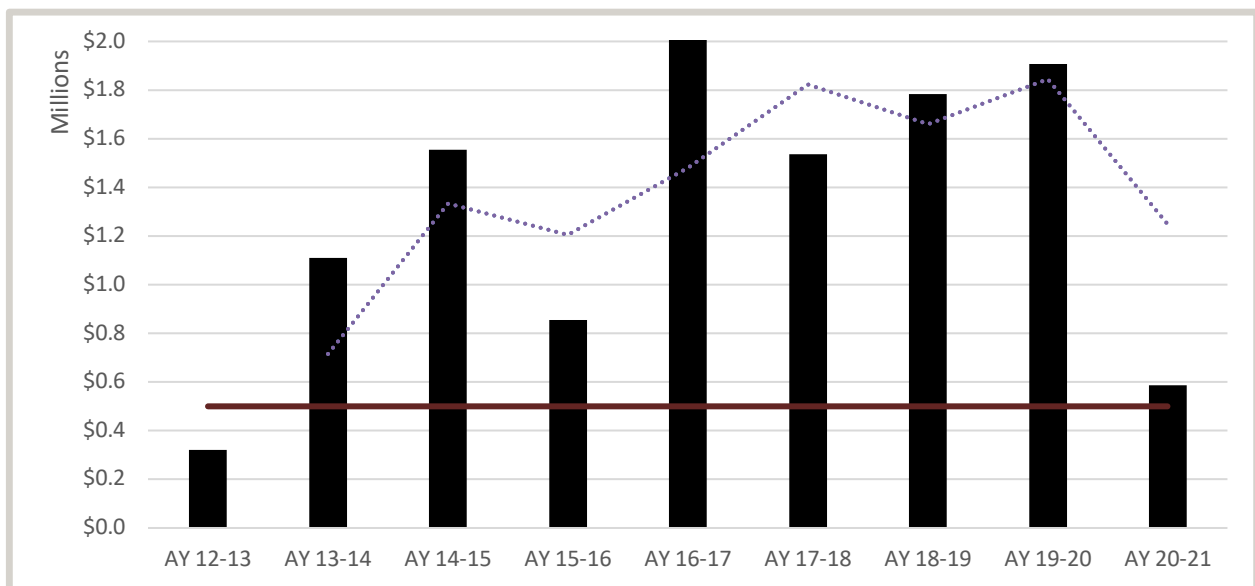
Kristen Shinohara
Assistant Professor
Golisano College of
Computing and
Information Sciences



Elizabeth Hane
Associate Professor
Thomas H. Gosnell School
of Life Sciences

RESEARCH FUNDING

Many of CASTLE’s larger affiliated grants ended this past year making it challenging during a year of COVID. The pandemic had a direct and negative impact on obtaining new funding. However, the new grants we did receive continue to support CASTLE’s mission and goals of professional development, discipline-based STEM research, and interdisciplinary collaboration with a focus on scholarship of pedagogy. We hope to pursue new award opportunities as support for the academic field gears back up.



CASTLE Active Awards

School or College	2020-2021 (\$8M)	2021-2022 (proj: \$5M)
SoPA	\$2,440,321	\$1,257,241
COS-Multi	\$2,472,919	\$1,315,679
SMS	\$781,224	\$0
CET	\$999,889	\$999,889
SCMS	\$555,284	\$781,248
GCCIS	\$524,692	\$365,432
GSoLS	\$336,993	\$336,993
CLA	\$0	\$25,000

2020-2021 New CASTLE Affiliated Grants

BCSER: Collaborative Research: Professional Development for Emerging Education Researchers: PEER Field Schools

This Institutes in Research Methods (BCSER: IRM) project extends the impact of the Professional development for Emerging Education Researchers (PEER) field school model to more than 750 emerging education researchers through a multi-pronged approach, thus building individual and community capacity for high-quality STEM education research. PEER field schools are flexible, responding to the needs of individual faculty and local communities, as well as deeply experiential and community-based. The project consists of gateway workshops to attract and motivate participants, 6-10 day introductory workshops - both residential (at Rochester Institute of Technology) and regional (at host institutions) - to give researchers extended time applying the fundamentals of education research to problems of individual interest, and advanced institutes that explore quantitative and qualitative methodologies in depth. Web resources, including curated repositories of research tools (e.g. surveys, observation and interview protocols) and "How To" articles, will be developed using the extensive user-design research that has resulted in the nationally established PhysPort repository for physics pedagogical resources.

Key Personnel:

Scott Franklin – PI

Funding:

\$529,578 (Project 32583)

\$57,750 (Project P2583)

RIT Cornerstone: Analytic and Expressive Communication

This proposal responds to Rochester Institute of Technology's unique heritage and character with initiatives that both satisfy students' career-related needs and helps equip them to be civically engaged, empathically attentive thinkers. We propose the creation of and implementation of "Analytic and Expressive Communication" (AEC) tiered options – immersion, minor, and an 18-credit certificate -- with clusters of course tracks informed by STEM faculty, a public advocacy presentation or exhibit, and the involvement of activities in our Expressive Communication Center in all AEC courses. A common intellectual experience will occur in the Civic Engagement and Voice / Public Speaking course which is required for all students to take (for the immersion, minor, and certificate). This course will be designed so that all sections of Civic Engagement and Voice / Public Speaking have a very similar curriculum.

Key Personnel:

Kelly Norris Martin – PI

Katie Terezakis – Co-PI

Funding:

\$25,000

Collaborative Research: Access Expansion: Growing a network of equity-focused programs in the physical sciences

Supporting equity in physics is of critical importance, as the representation of women and underrepresented minority students has stagnated. These have been attributed to aspects of academic culture such as harsh educational practices and gatekeeping attitudes. Efforts to recruit and retain women and underrepresented minority students often work toward identifying gaps in student preparation and knowledge and ameliorating those deficits. Within departments, students and faculty have made progress toward creating communities that enact these alternative cultures. The Access Network formed in 2015 to connect six such programs and provide them with resources, expertise, and knowledge related to equity work, institutional change, and STEM education. Access provides its participants with a new model for physics culture that values equity, student leadership, and holistic support. This proposal seeks to increase the number of Access sites while maintaining and improving existing activities.

Key Personnel:

Scott Franklin – PI

Funding:

\$43,698 (32674)

\$92,100 (P2674)

ANNUAL SYMPOSIUM

The 8th Annual CASTLE Symposium



The graphic features the text "8th Annual CASTLE Symposium" in a bold, black font. Below the text is a horizontal orange bar with the words "CASTLE Symposium" in white. Underneath the bar is a collage of four images: a woman speaking at a podium, a person in a lab coat, a Zoom meeting grid, and a person presenting at a whiteboard.

8th Annual CASTLE Symposium

A Virtual Celebration of Our...

- Discipline-based Education Research
- Learning Assistant Program
- Inclusive Excellence Program Achievements
- CASTLE Collaborations and Highlights

The 8th Annual CASTLE Symposium was held virtually on Thursday, May 6, 2021. Forty eight people participated online to acknowledge, thank, and honor so many for their contributions and accomplishments during a most challenging year.

The Symposium began with a poster session on gather.town, allowing individuals to walk up to the posters and discuss research in a virtual space. The session showcased student research projects focusing on pedagogy and STEM education.

The symposium then moved to Zoom, where CASTLE director Scott Franklin, Provost Ellen Granberg, and College of Science Dean Sophia Maggelakis provided welcoming remarks. The symposium theme was “Gratitude,” and the remarks honored those who have delivered programs, seminars, research and discussions that built community and support to the College of Science and across campus.

CASTLE’s Inclusive Excellence Initiative played a major role in both enabling discussions to address issues of inclusion and equity and providing long-term strategic input into the College of Science’s Diversity, Equity, and Inclusion Plan.

CASTLE's Learning Assistant program was recognized, and this year brought further institutionalization with College of Science schools assuming a greater share of the cost. The program continued to provide opportunities for undergraduates to build leadership skills, test the waters of teaching, and strengthen their discipline knowledge base.

The Center maintained a high level of research activity in labs, journal clubs, guest speakers, and a highly successful summer 2020 SMERC REU virtual program.

An award ceremony followed honoring recipients of the Science and Math Education Research Special Honor Award, CASTLE Special Honor Award, and Inclusive Excellence Special Honor Award. Additionally, the Undergraduate Learning Assistants were presented with special awards and recognitions for their outstanding dedication to the program, helping transform classrooms utilizing a peer-to-peer small group method of learning.



CASTLE Awards:

During each annual celebration, CASTLE awards are given to a select few who have impacted the growth and success of the Center. This year's award recipients are:

Eli Borrego, Assistant Professor
Thomas H. Gosnell School of Life Sciences
Inclusive Excellence Initiative Recognition of Excellence

Dina Zohrai Alae, Postdoctoral Associate
School of Physics and Astronomy
Science and Math Education Research Special Honor

Rita Margarida Magalhães, Inclusive Excellence Program Coordinator
CASTLE Recognition of Excellence

Emalee Wrightstone, College of Science Learning Assistant
Learning Assistant Program Recognition of Excellence

The following additional learning assistant students were acknowledged with gratitude for outstanding dedication and service and were delivered certificates.

Seth Jones
Certificate of Outstanding First Time Learning Assistant

Anna Neuenschwander
Certificate of Outstanding Senior Learning Assistant

Aleea Wrightstone
Certificate of Outstanding Veteran Learning Assistant

Nana Aikins
Certificate of Honorable Mention

Ashley Martsen
Certificate of Honorable Mention

Vanessa Baker
Gage Blackwell
Daniel DiMartino
Erika Doroshenko
Tim Forst
Nadia Moore
Katie O'Neill-Knasick
Kristen Patten
Makayla Reed
Certificates of Honorable Mention
Introduction to Biology Team

PUBLICATIONS

The CASTLE Center had **25** publications by core CASTLE members.
Bold = core CASTLE member, Underline = undergraduate student

Newman DL, Coakley AJ, Link A, Mills K, **Wright LK** (2021). Punnett Squares or Protein Production? The Expert-novice Divide for Conceptions of Genes and Gene Expression. *CBE-Life Sci Education*, *accepted pending revisions*.

Wright LK, Cortez P, Franzen M, **Newman DL** (2021). Teaching Meiosis with the DNA Triangle Framework: A Classroom Activity that Changes How Students Think about Chromosomes. *Biochem Mol Biol Educ*, *accepted pending revisions*.

Wyatt BN, **Magalhães RM**, Michel LV, **Newman DL** (2021). Development of a Faculty Learning Community to Foster Inclusive Research Mentoring. *J Faculty Dev* 35(2):44-49.

Griston M, Botello J, Verostek M, **Zwickl BM** (2021). When the Light Bulb Turns On: Motivation and Collaboration Spark the Creation of Ideas for Theoretical Physicists, *Proceedings of the 2021 Physics Education Research Conference* (accepted).

Alaee DZ, **Zwickl BM** (2021). A Case Study Approach to Understanding a Remote Undergraduate Research Program, *Proceedings of the 2021 Physics Education Research Conference* (accepted).

Miller CW, **Zwickl BM**, Verostek M (2021). Time to PhD Completion is No Different Between Men and Women Despite Score Gap on Physics GRE., *Proceedings of the 2021 Physics Education Research Conference* (accepted).

Cardona P, Alaee DZ, **Zwickl BM**(2021). Access to Opportunities Affects Physics Majors' Interest and Choice of Methods Specialization. *Proceedings of the 2021 Physics Education Research Conference* (accepted).

Johnson R, **Magalhães RM** (2021). Helping Students Provide Better End-of-Semester Feedback. Teaching and Learning Services Blog, Rochester Institute of Technology, Rochester, NY. <https://www.rit.edu/academicaffairs/tls/helping-students-provide-better-end-semester-feedback>.

Aiello CD. et al. Authors include **Zwickl BM** (2021). Achieving a Quantum Smart Workforce, *Quantum Science and Technology*, 6, 030501.

Martin KN, **Zwickl B**, Ross R, Kronimus K (2021). Contributor to Communications Skills, in A Guide to Effective Practices for Physics Programs

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Elliot K, Eljalafia N, **Newman DL**, **Wright LK**, Mosier A (2021). Drawing as a Learning and Instructional Tool in Microbiology Education. Submitted to the *International Journal of STEM Education*.

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Newman DL, Cardinale JA, **Wright LK** (2020). Interactive Video Vignettes (IVVs) to help students learn genetics concepts. *CourseSource* Vol 7. doi: 10.24918/cs.2020.27.

Martin KN (2020). Merging Communication Across Disciplines: Communication competence, socialization, and cultures. 107th National Communication Association Communication across Disciplines Preconference, Virtual Conference.

Martin KN, Barnes S (2020). Will Things Ever be the Same Again? Imagining the Past in Post-Normal Times. Panel presentation 107th National Communication Association Communication across Disciplines Preconference, Virtual Conference.

Martin KN, Worrell T (2020). Culture and Visual Proficiency: An examination of the relationship between image ratings and perceived design expertise. 107th National Communication Association Communication across Disciplines Preconference, Virtual Conference.

Magalhães RM, Hane EN (2020). Building Inclusive Classroom Practices: A Curriculum for Faculty Learning Communities Based on Metacognition. *Journal of Faculty Development*, 34(3), pp. 124 - 131.

Magalhães RM, Johnson R (2020). Designing Inclusivity into Your Course. Teaching and Learning Services Blog, Rochester Institute of Technology, Rochester, NY. <https://www.rit.edu/academicaffairs/tls/designing-inclusivity-your-course>.

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Wilson EC, **Franklin, SV** (2020). Who Goes where: Patterns in Academic Field Switching of Successful College Graduates. 2020 *Physics Education Research Conference Proceedings*, 587.

Ryan QX, Del Agunos D, **Franklin SV**, Gomez-Bera M, Sayre EC (2020). Question Characteristics and Students' Epistemic Framing. *Physics Education Research Conference Proceedings* 442.

Wright LK, Dy GE, **Newman DL** (2020). Undergraduate Textbook Representations of Meiosis Neglect Essential Elements. *American Biology Teacher*. Vol 82(5). <https://doi.org/10.1525/abt.2020.82.5.296>.

Fox MFJ, **Zwickl BM**, Lewandowski HJ (2020). Preparing for the Quantum Revolution: What is the Role of Higher Education? *Physical Review Physics Education Research*, 16, 020131.

Owens LM, **Zwickl BM**, **Franklin SV**, Miller CW (2020). GRE Requirements Create Uneven Playing Field for Graduate Applicants, Physics, *Proceedings of the 2020 Physics Education Research Conference*, Grand Rapids, MI.

PRESENTATIONS

The CASTLE Center had 19 presentations by core CASTLE members.
Bold = core CASTLE member, Underline = undergraduate student

Magalhães RM, **Newman DL**, **Franklin S**. How Inclusion is Communicated (or not) through the Course Syllabus. Niagara University, January 12, Invited talk (2021).

Zwickl BM. Session organizer and session Chair for 2021 APS March Meeting Session, Quantum Information Education (2021).

Glaser R, **Newman DL**. Inverting the Genetics Curriculum: Making Genetics More Accessible and Inclusive. Microbrew (talk) presented at the 2021 American Society for Microbiology Conference for Undergraduate Educators (ASMCUE). Online. (July 1, 2021).

Wright LK, **Newman DL**. The DNA Landscape: A tool for communicating processes and concepts related to DNA. Microbrew (talk) presented at the 2021 ASMCUE. Online. (June 30, 2021).

Newman DL, **Wright LK**. A card sorting task that gives insight into student thinking about DNA. Microbrew presented at the 2021 ASMCUE. Online. (June 29, 2021).

Wright LK, **Newman DL**, Zohrabi Alae D, Dancy MH. The DBER REU Program at the Rochester Institute of Technology: A Model for Virtual Research Experiences. Poster presented at the X-DBER 2021 Conference. Online, hosted by University of Nebraska – Lincoln. (March 3, 2021).

Newman DL, Wrightstone E, Trumpore L, **Wright LK**. The DNA Landscape: A Novel Framework for Teaching and Learning Molecular Genetics Concepts. Talk given at the X-DBER 2021 Conference. Online, hosted by University of Nebraska – Lincoln. (March 1, 2021).

Newman DL. Connecting Concepts from Molecules to Chromosomes: Where is the Missing Link for Students? Undergraduate Genetics Education Network 1st Annual Workshop. Virtual Format. Invited. (January 7, 2021).

Glaser R, **Newman DL** (co-chairs). Pedagogy of a Pandemic. Undergraduate Genetics Education Network Virtual Workshop. Lead/Organized Workshop, (January 7, 2021).

Magalhães RM, **Newman DL**, **Franklin S**. How Inclusion is Communicated (or not) through the Course Syllabus, AAC&U STEM Conference (virtual), November 6, Poster (2020).

Hane EN, **Magalhães RMQ**, Nguyen E, **Franklin SV**. Lateral Transfer Maps as a Metacognitive Tool in First Year STEM Courses. (2020). CourseSource. <https://www.coursesource.org/courses/lateral-transfer-maps-as-a-metacognitive-tool-in-first-year-stem-courses>

Zwickl BM. Integrating Computation, Experimentation, Projects, and Human-centered Applications in Lab Course. Invited Presentation to the 2020 Summer Meeting of the American Association of Physics Teachers (2020).

Link AP, Coakley AJ, Mills K, **Newman DL**, **Wright LK**. Student Ideas about Gene Expression: Making Proteins vs. Punnett Squares. Poster presented at the 2020 NABT Professional Development Conference. Online. (November 7, 2020).

Magalhães RM, Wyatt B, **Newman DL**, **Franklin S**. Challenges and Keys to Successfully Implementing Inclusive Teaching. Poster Presented at the AAC&U 2020 Virtual Conference on Transforming STEM Higher Education. (November 6, 2020).

Magalhães RM, **Newman DL**, **Franklin S**. How Inclusion is Communicated (or not) Through the Course Syllabus. Poster Presented at the *AAC&U 2020 Virtual Conference on Transforming STEM Higher Education*. (November 6, 2020).

Newman DL, Spector H, Trumpore L, Neuenschwander A, Miller A, **Wright LK**. A Card Sorting Task Provides Insight into Student Understanding of Genetic Concepts. American Society of Human Genetics 2020 Virtual Meeting. (October 26, 2020).

Newman DL. Exploring Research Trajectories in Biology. University of Tokyo College of Arts and Sciences Global Faculty Development Initiative. Online. Invited. (November 18, 2020)

Newman DL. Integrating Research into Teaching. University of Tokyo Global Faculty Development Online Workshop. Led/Organized Workshop, (November 18, 2020).

Valentine H. The Genetics Research Workforce & Barriers Part 1: Experiences of Black, Latino, Indigenous and all Underrepresented Scientists of Color (Early-Career Focus). Moderators: Hanchard N, **Newman DL**, Acktins K. American Society of Human Genetics (ASHG). Virtual session (Aug 25, 2020).

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)

Deanna Abid (Inclusive Excellence fellowship, RIT, biotechnology & molecular biosciences)

Ella Bahr (REU, Kansas State University)

Lydie Guercin (REU, Emory University)

Derek Dang (REU, University of Alabama at Birmingham)

Liliana Tinoco (REU, Lewis University)

Hannah Spector (RIT, biotechnology & molecular biosciences/biomedical sciences)

Emalee Wrightstone (B.S. RIT 2021 in biotechnology & molecular biosciences, starting ph.D. program at Cornell University)

Lauren Trumpore (B.S. RIT 2021 in biotechnology & molecular biosciences)

Anna Neuenschwander (B.F.A. RIT 2021 in medical illustration)

Jade Mullen (RIT, biotechnology & molecular biosciences)

Scott Franklin

Jack Ryan (RIT, physics)

Ollie Yakimow (RIT, physics)

Zhi Shi (RIT, applied mathematics)

Emma Krofcheck (REU 2021, University of Pittsburgh)

Beck Tedeschi (REU 2021, new College of Florida)

Ben Zwickl

Molly Griston REU 2020, University of Rochester)

Micah Campbell (RIT, physics, class of 2020)

Pedro Cardona (RIT, physics class of 2021)

Ridge Bennett (RIT, physics class of 2022)

Kayleigh Patterson (RIT, physics class of 2023)

Rebecca Verchimak (REU 2021, Coe College)

Mark Flores (REU 2021, McDaniel College)
Matthew Dunham (REU 2021, CSU Monterey Bay)
Michael Verostek (University of Rochester, non-matriculated RIT graduate student, Zwickl serving as dissertation advisor)

NOTABLE ACHIEVEMENTS

Jeanne Christman

2020-2025

Recipient of nearly \$1 million from NSF for S-STEM: Self-Determined Critical Mass of Engineering Technology Scholars (SD CoMETS). Funding scholarships for economically disadvantaged and academically-talented students and faculty development toward further enhancing engineering education.

Scott Franklin

2017-2021

American Physical Society Education Policy Committee, Chair

2020

Named American Physical Society Fellow

Leslie Kate Wright

2021-present

Research Editor for *Journal of Microbiology and Biology Education*

Ben Zwickl

2020-2021

Collaborating with Professor Qingxia Li at Fisk University on Dr. Li's recently awarded grant BCSEER: Investigating Factors that Influence African American Students' Selection of Computational Internships and Careers. Ben is senior personnel on the proposal and serves as an advisor and collaborator with Dr. Li.

Dina Newman

2019-2020

Promoting Active Learning and mentoring (PALM) Network Mentor

Jeanne Christman

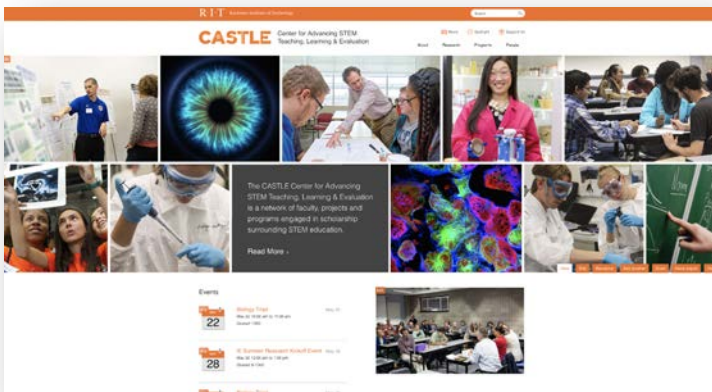
2020-2025

Recipient of nearly \$1 million from NSF for S-STEM: Self-Determined Critical Mass of Engineering Technology Scholars (SD CoMETS). Funding scholarships for economically disadvantaged and academically-talented students and faculty development toward further enhancing engineering education.

WEBSITE

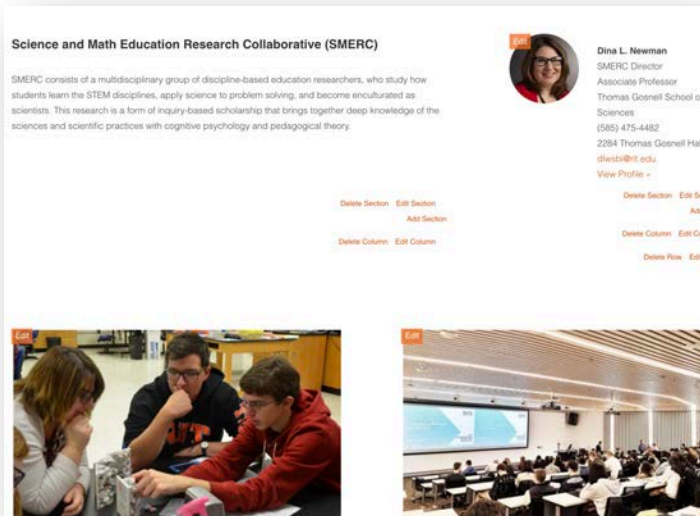
The CASTLE website functions as a collection of information on projects, research initiatives, and programs carried out by faculty, research associates, instructional service professionals, and communication experts engaged in scholarship surrounding STEM education.

Updated information is listed on the website pages with contact information for each specific area.



The **CASTLE** site serves as a home-base for all **CASTLE-affiliated programs, research and initiatives**. It houses a calendar on the home page highlighting past, current and upcoming events.

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



Science and Math Education Research Collaborative (SMERC) has several research group overviews, a journal club, and guest invited speaker listings with links to additional information. This is one of the main menu options on the site, as it is the overarching research arm of CASTLE.

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

Overview >

Faculty Mentor Info

Student Learning A Information >

Additional Resour

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Welcome 2021 Spring Learning Assistants!

Delete Section Edit Section

The **Learning Assistant Program** pages continue to expand with benefits to faculty mentors and student LAs. The program has grown and serves as a national leader among other LA Programs across the country. <https://www.rit.edu/castle/programs/learning-assistants/overview>

Overview >

People >

Strand 1: Res

Strand 2: Cla

Strand 3: Co

The **Inclusive Excellence Initiative** page links to events, workshops, and group discussions held throughout the year. The highly successful faculty mentor/student research summer program interviews are posted there as well. <https://www.rit.edu/castle/programs/hhmi/overview>

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About PEER

PEER is designed for emerging education researchers interested in expanding their theoretical or methodological expertise. Through peer and near-peer exchange, PEER helps faculty, postdocs and graduate students through field schools, intensive workshops, research projects, mentoring, and community involvement. Many continue on after taking the program, doing research in working groups, submitting papers for peer reviewed publication or designing research projects with others. PEER focuses on Discipline-based Education Research, advancing both scholarship and teaching goals that are valued at all types of academic institutions.

Who Benefits From the PEER Program?


PEER participants come from a wide range of science backgrounds and professions. Participants include:


- discipline-based education researchers looking to expand their methodological repertoire
- disciplinary faculty just getting started on the scholarship of teaching and learning
- education faculty looking to join a research group and access video-based data
- faculty development experts learning to mentor faculty through scholarship of teaching and learning (SoTL) projects
- grad students and postdocs who need mentoring and community support for their research projects
- undergraduate students who attend field schools with their advisors


Current PEER World Locations

Delete Section Edit Section

Contacts

 **Scott V. Franklin**
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 Astronomy, Kansas State University
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 2116 Carlson Building
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 **Eleanor Sayre**
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 Kansas State University
 (785) 532-2124
 esayre@phys.ksu.edu

 **Mary Bridget Kustusch**
 Associate Professor
 Department of Physics
 DePaul University
 (773) 325-0389
 mkustusch1@depaul.edu

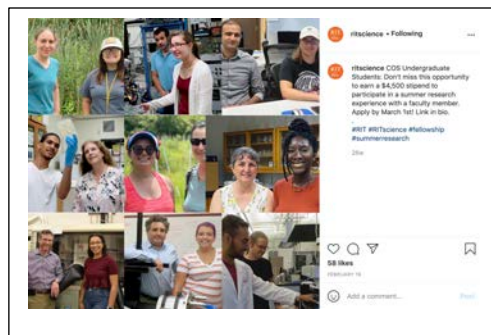
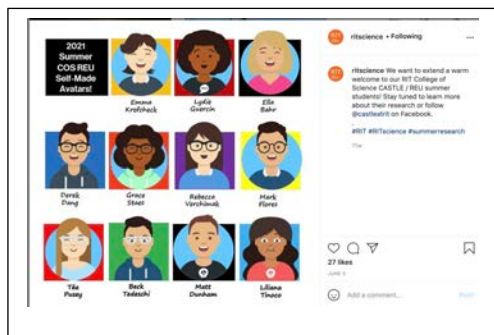
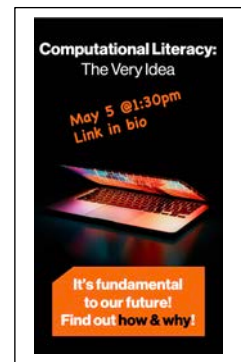
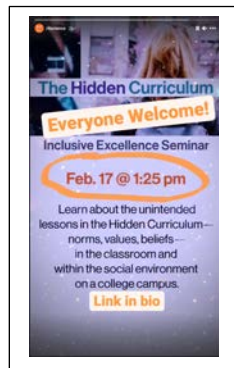
Professional-development for Emerging Education Researchers (PEER) continues to expand, with the recent grant award for a field school in Kazakhstan awarded by the Embassy of the United States of America in Kazakhstan—American Council for International Education. <https://www.rit.edu/castle/research/smmerc>

SOCIAL MEDIA

This past year CASTLE expanded its social media by partnering with the College of Science Instagram, Facebook, and Twitter to assure a larger reach. Instagram stories were seen by 1455 page visitors, while Facebook and Instagram posts totaled 9401 impressions.

CASTLE events and recruitment messages were designed for Instagram stories (as a way of reaching students). Facebook and Twitter were repeated on CASTLE’s pages. The following are just a few examples of posts, tweets, and stories this past year.

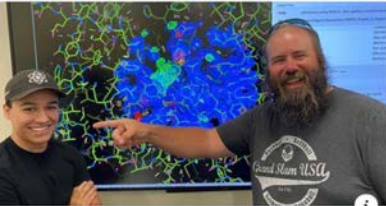
Instagram Stories (up for 24 hours with animation) and Posts (Examples):



Facebook Posts (examples):

RIT College of Science
August 11 at 12:00 PM · 🌐

Not your typical summer! Ryhi Charles was one of nine COS students who received funding to conduct research this summer through the HHMI Inclusive Excellence Summer Research Experience. Charles studied proteins that may cause pathogenic bacteria to remain dormant and immune to antibiotics.



RIT.EDU
RIT HHMI Inclusive Excellence program offers students an early chance to delve into research

RIT College of Science
April 22 · 🌐


Let's talk about food insecurity and how it's impacting our campus. Join the Inclusive Excellence Brown Bag Inclusion Conversation, facilitated by Sharon Kompalla-Porter, Associate Director, Center for Residence Life, and Rita Margarida Magalhães, Inclusive Excellence Program Coordinator on April 30, 1-2 pm. Register today! <https://bit.ly/3gw543>



Inclusive Excellence Brown Bag

RIT College of Science
May 27 · 🌐

Gain valuable student teaching and leadership skills, while supporting the teaching goals of faculty mentors. Students receive an hourly wage totaling up to \$1,875 per semester. No minimum GPA required. The deadline is right around the corner! Sign up today: <https://bit.ly/3T5KAPE>



Are you interested in the Learning Assistant (LA) Program in Fall 2021?

CASTLE at RIT
May 27 · 🌐

Don't miss the deadline to apply for the **RIT College of Science** CASTLE Learning Assistant Program! It has been **EXTENDED** to June 4!

This ever-growing program pr... See More

You Retweeted

RIT Photonics @RITPhotonics · Apr 23

Scientists including Ben Zwick (@RITscience), @mffox (@CU Boulder), & @NickVamvakas (@UofR) have a new accepted manuscript in @IOPublishing: "Achieving a quantum smart workforce" #RITPhotonics #QuantumEducation #WorkforceDevelopment [iopscience-iop.org.ezproxy.rit.edu/article/10.108...](https://science-iop.org.ezproxy.rit.edu/article/10.108...)



RIT CASTLE @RITCASTLE · Mar 29


Attend the @RITscience Learning Assistant Program Recruitment 2, 10-11:30am. Register today bit.ly/3cy1gaf. Learn how the prog provides teaching and leadership skills, while supporting the tea of faculty mentors.



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CASTLE at RIT
Published by Debra Jacobson · April 23 · 🌐

Ben Zwick, RIT College of Science physics professor and CASTLE member, is co-author of the published paper "Achieving a Quantum Smart Workforce." Read More <https://bit.ly/32Jajf>. #ResearchMatters #ritscience #RIT



Twitter Tweets (examples):

RIT CASTLE @RITCASTLE · Mar 3

Join the discussion of "Picture a Scientist," looking at the inclusion or exclusion of women in the field of science throughout the years. Register today for this @RITscience Brown Bag discussion on March 19 at 12pm. bit.ly/3reB758 #ritscience #RIT #WomeninSTEM



RIT CASTLE @RITCASTLE · Feb 24

How inclusive do @RITscience staff feel we are? Find out on March 10, 1:25 - 2:15pm and discuss together ideas and implementation moving forward. All COS faculty and staff are welcome. Register today! bit.ly/37KAh8y #Inclusiveness #inclusionmatters



EVENTS | IN THE NEWS

September 4, 2020
 Read More [Here](#)



RIT's College of Science awarded NSF grant to train emerging STEM education researchers

Latest News

September 4, 2020



André Hudson: Encouraging Tomorrow's Scientists, One Person and One Paper at a Time

Dr. André Hudson is well-known for training students in how to effectively communicate their scientific work, so his new role comes as no surprise. Beginning in January 2021, Dr. Hudson will join academics from universities like Harvard, MIT, and Yale on the Journal of Biological Chemistry (JBC) Editorial Board.

September 4, 2020



RIT collaborates with 13 other universities to understand climate change and ecosystems

RIT is one of 14 universities from around the globe that have collectively been awarded \$12.5 million from the National Science Foundation to launch a new Biology Integration Institute. It will focus on better understanding ecosystem and climate interactions—like the thawing of the Arctic permafrost—and how they can alter everything from the landscape to greenhouse gases.

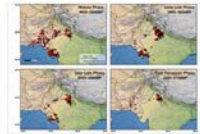
September 4, 2020



RIT's College of Science awarded NSF grant to train emerging STEM education researchers

The National Science Foundation awarded RIT's College of Science a three-year, \$587,000 Building Capacity in STEM Education Research grant. The grant is part of a \$1 million collaborative project that aims to extend the impact of the Professional development for Emerging Education Researchers (PEER) field school model to hundreds of emerging education researchers.

September 2, 2020



New mathematical method shows how climate change led to the fall of an ancient civilization

Nishant Malik, assistant professor in RIT's School of Mathematical Sciences, has developed a mathematical method that shows how shifting monsoon patterns led to the demise of the Indus Valley Civilization, a Bronze Age civilization contemporary to Mesopotamia and ancient Egypt.

September 21, 2020

RIT | School of
this week in COS

Week of September 21, 2020

Inclusive Classroom Practices: Keys to Success

Inclusive Excellence Seminar
 Wednesday, Sept. 23 @ 1:25 - 3:15 p.m.

EVENTS

Chemistry and Materials Science Seminar
Functional Metal Oxide Shape Design Using a Non-hydrolytic Sol-Gel Approach: Breaking Down That Inorganic-Organic Barrier
 Dr. Scott Williams
 Director
 Materials Science and Engineering MS Program, RIT

September 30, 2020
Read More [Here](#)

RIT Professor Scott Franklin named American Physical Society Fellow

Franklin elected upon recommendation of the APS Forum on Education



RIT Professor Scott Franklin has been elected a Fellow of the American Physical Society. Here he is pictured during the 2020 announcement of the Howard Hughes Medical Institute's Inclusive Excellence Initiative at RIT.

October 1, 2020
Read More [Here](#)

A screenshot of a web page from the Rochester Institute of Technology. The page title is "Diversity Theater Workshop for RIT Students". It features a large yellow banner with the text "Community Building During Physical Distancing" and "A Special Virtual Diversity Theater Workshop for All RIT Students". There are buttons for "Register Now" and "Add to Calendar". The page includes social media icons, a navigation menu, and an "Event Snapshot" section with details like "October 07, 2020" and "4:00 pm - 5:30 pm".

October 12, 2020

A graphic for "RIT College of Science this week in COS". It features an orange header with the RIT logo and "this week in COS" in white. Below, it says "Week of October 12, 2020". A section titled "Special Event Next Week" highlights "Discussions with George M. Johnson" with a small portrait of him. To the right is a book cover for "ALL BOYS" featuring a portrait of a young man with a crown of flowers.

Rochester Institute of Technology


About ▾ Academics ▾ Experiential Learning ▾ Admissions and Aid ▾ Research ▾ **RIT Life ▾** Athletics

RIT / News

October 14, 2020 by [Luke Auburn](#) Follow @lukeauburn

RIT to host virtual discussion with author, journalist, activist George M. Johnson

Inclusive Excellence program organized webinar with author of 'All Boys Aren't Blue' on Oct. 21



Author, journalist, and activist George M. Johnson will speak during a Zoom webinar from 1:30 to 2:30 p.m. on Wednesday, Oct. 21.

Rochester Institute of Technology's Inclusive Excellence program will host a virtual discussion with acclaimed author, journalist, and activist George M. Johnson. Johnson, whose work explores the

Topics

October, 2020

Newsmakers

Scott Franklin, a professor in the School of Physics and Astronomy and director of RIT's Center for Advancing STEM Teaching, Learning and Evaluation (CASTLE), received funding to help establish a **PEER** field school in Kazakhstan. The grant was awarded by the Embassy of the United States of America in Kazakhstan, by the American Council for International Education. Franklin and PEER co-director, Eleanor Sayre of Kansas State University, together with others in the program, will improve STEM faculty members' pedagogical knowledge in English and prepare STEM faculty to measure student learning and development.

November 11, 2020

Rochester Institute of Technology

About ▾ Academics ▾ Experiential Learning ▾ Admissions and Aid ▾ Research ▾ **RIT Life ▾** Athletics

College of Science Listening Circle on Mental Health

Register Now
Add to Calendar

RIT / RIT Life / Events / College of Science Listening Circle on Mental Health



Listening Circle on Mental Health

for College of Science Students

Listening Circle on Mental Health

Jaimie Castillo, Inclusive Excellence Team, and Women in Science
Center for Advancing of STEM Teaching, Learning, and Evaluation
Counseling and Psychological Services

Event Snapshot

When and Where
November 11, 2020
1:30 pm - 2:30 pm
Virtual
Room/location: See Zoom Registration Link

November 13, 2020

The screenshot shows the RIT website header with navigation links: About, Academics, Experiential Learning, Admissions and Aid, Research, RIT Life, and Athletics. The main heading is "Learning Assistant Program Recruitment Fair" with "Register Now" and "Add to Calendar" buttons. Below is a social media sidebar with icons for Facebook, Twitter, LinkedIn, YouTube, and Instagram. The main content area features a large graphic with the text "Learning Assistant Program Recruitment Fair" and the RIT logo. To the right, an "Event Snapshot" section provides details: "When and Where" (November 13, 2020, 10:30 am - 11:30 am), "Virtual", and "Room/Location: See Zoom Registration Link". A "Who" section is also present. A "Register Here for Zoom Link" button is located below the main heading.

November 16, 2020

The banner has an orange header with the RIT College of Science logo and the text "this week in COS". Below the header, it says "Week of November 16, 2020". The central focus is a brown paper bag labeled "Inclusive Excellence" and "Brown Bag Inclusion Conversations Series". To the right of the bag, the text reads "21-Day Racial Equity Challenge Debrief" and "Friday 11/20 @ 12:00 p.m. Hosted by the Inclusive Excellence Initiative". At the bottom of the banner, the word "EVENTS" is written in bold.

The event details are presented in a light gray box. It starts with the "Inclusive Excellence" logo and the event title "21-Day Racial Equity Challenge Debrief". The description reads: "Unwind from the week, bring a lunch, and share your experience with the Racial Equity Challenge. Build connections, share personal challenges, and gain new insights on working toward racial equity." The date and time are listed as "Friday, November 20 12:00pm to 1:00pm". A link for "Full Event Details" is provided. At the bottom, there is a blue button labeled "Zoom Registration Link".

December 2, 2020

The screenshot shows the RIT website with a navigation bar at the top. The main heading is "How Inclusion is Communicated (or not) Through the Course Syllabus". Below the heading are buttons for "Register Now" and "Add to Calendar". A large graphic in the center contains the title "How Inclusion is Communicated (or not) Through the Course Syllabus". To the right, there is an "Event Snapshot" section with "When and Where" information: "December 02, 2020".

January 6, 2021

The flyer features a large orange and black graphic on the left with the text "COS Student Mental Health: Survey Report and Discussion". On the right is a photograph of a student sitting on a couch using a laptop. Below the graphic, the date and time are listed as "January 6, 1:25-2:15pm". The facilitators are "Rita Margarida Magalhães, Program Coordinator, Inclusive Excellence" and "Jaime Castillo, RIT Student Affairs Mental Health Therapist (embedded in COS)".

January 20, 2021

The flyer is titled "Inclusive Excellence Initiative" with sub-headings "RESEARCH · COMMUNITY · CLASSROOM". The main title is "Inclusive Mentoring Practices" next to a photo of a lab. The date and time are "January 20, 1:25-2:15pm". The facilitators are "Lea Vacca Michel, Research Strand Lead, Inclusive Excellence" and "Rita Margarida Magalhães, Program Coordinator, Inclusive Excellence". A bulleted list of objectives includes: "Learn strategies that make the lab a more inclusive space", "Identify one strategy you can apply in your research group", "Discuss how to implement these strategies", "Share your tips for an inclusive lab", and "Develop a more reflective mentoring practice". A QR code and a "Please register here for your Zoom link" text are also present.

January, 2021

Scott Franklin, a professor in the School of Physics and Astronomy and director of RIT's Center for Advancing STEM Teaching, Learning and Evaluation (CASTLE), received funding to help establish a **PEER** field school in Kazakhstan. The grant was awarded by the Embassy of the United States of America in Kazakhstan, by the American Council for International Education.



Franklin and PEER co-director, Eleanor Sayre of Kansas State University, together with others in the program, will improve STEM faculty members' pedagogical knowledge in English and prepare STEM faculty to measure student learning and development.

February 12, 2021



Rochester Institute of Technology

About Academics Experiential Learning Admissions and Aid Research RIT Life Athletics

Black in STEM - Inclusive Excellence Brown Bag Inclusion Conversations Series

Register Now
Add to Calendar

RIT / RIT Life / Events / Black in STEM - Inclusive Excellence Brown Bag Inclusion Conversations Series



Black in STEM

Hosted by the Inclusive Excellence Initiative

Black in STEM

Discuss ways in which we can do effective allies and foster a sense of belonging for our Black students, staff and faculty.

Register Here for Zoom Link

Facilitated by Akele Mangena Maghiesse, Ph.D.
Inclusive Excellence Program Coordinator
Center for Advancing of STEM Teaching, Learning, and Evaluation

Event Snapshot

When and Where
February 12, 2021
12:00 pm - 12:50 pm
Virtual
Room/Location: See Zoom Registration Link

Who
Open to the Public

Interpreter Requested?

RIT College of Science
Inclusive Excellence

February 12, 12:00p.m. - 1:00p.m.

Black in STEM



February 17, 2021


Rochester Institute of Technology

About ▾ Academics ▾ Experiential Learning ▾ Admissions and Aid ▾ Research ▾ **RIT Life ▾** Athletics

Inclusive Excellence Seminar: The Hidden Curriculum

[Register Now](#)
[Add to Calendar](#)

RIT / RIT Life / Events / Inclusive Excellence Seminar: The Hidden Curriculum



The Hidden Curriculum
Learn about the untaught lessons in the Hidden Curriculum—norms, values, beliefs—in the classroom and within the social environment on a college campus.

[Register Here for Zoom Link](#)

The hidden curriculum refers to the lessons which are “learned but not openly intended” such as the norms, values, and beliefs conveyed both in the classroom and by the social environment.

Event Snapshot

When and Where
February 17, 2021
1:25 pm - 2:15 pm
Virtual
Room/Location: See Zoom Registration

Who
Open to the Public

February 23, 2021


Center for Advancing STEM Teaching, Learning & Evaluation (CASTLE)

Learning Assistant Alliance Information Session

Whether you are currently an LA or Mentor or just thinking about it—learn about the benefits of being an LA Alliance member and be a part of classroom transformation!

Tuesday, February 23
2:00pm to 3:00pm
[Full Event Details](#)

[Zoom Registration Link](#)



ritscience • Following

ritscience COS Undergraduate Students: Don't miss this opportunity to earn a \$4,500 stipend to participate in a summer research experience with a faculty member. Apply by March 1st! Link in bio.

#RIT #RITscience #fellowship #summerresearch

2d

57 likes
2 DAYS AGO

Add a comment... [Post](#)

February 26, 2021

Dina Newman, associate professor in the Thomas H. Gosnell School of Life Sciences, helped establish the Undergraduate Genetics Education Network (UGEN). Newman and co-chair Rivka Glaser from Stevenson University gathered together geneticists and education specialists from across the U.S. to organize this event aimed at faculty who teach genetics to undergraduates. The first virtual workshop was a success with more than 600 registrations for the event.

March 5, 2021


The screenshot shows a web page for an event titled "Unpacking Title IX at RIT". At the top left, it says "RIT" and "RIT Life / Events / Inclusive Excellence: Unpacking Title IX at RIT". There are social media icons for Facebook, Twitter, LinkedIn, YouTube, and Instagram. A brown paper bag icon is labeled "Brown Bag Inclusion Conversations Series". The main heading is "Unpacking Title IX at RIT" with the subtext "Hosted by the Inclusive Excellence Initiative". Below this, it says "IE Brown Bag Inclusion Conversations Series" and "The Accusation: Unpacking Perceptions and Realities of the Title IX Process at RIT". A short description follows: "This is your chance to unpack your own perceptions, ask questions, and learn the realities of the Title IX process at RIT." There is a "Register Here for Zoom Link" button. The "Facilitated by" section lists: Stacy DeRosier, Director of Title IX and Clery Compliance; Carol Lane-Williams, Assistant Director of Title IX and Clery Compliance; Kara Maki, Associate Professor, School of Mathematical Sciences; and Rita Margarita Magalhães, Inclusive Excellence Program Coordinator. On the right, an "Event Snapshot" section provides details: "When and Where" (March 05, 2021, 12:00 pm - 1:00 pm, Virtual, Room/Location: See Zoom Registration Link), "Who" (This is an RIT Only Event), and "Interpreter Requested?" (No). An "Add to Calendar" button is at the top right.

March 19, 2021

The screenshot shows a web page for an event titled "Picture a Scientist Open Discussion Presented by Inclusive Excellence". At the top right, there are "Register Now" and "Add to Calendar" buttons. The page header includes "RIT / RIT Life / Events / Picture a Scientist Open Discussion Presented by Inclusive Excellence". Social media icons are on the left. A brown paper bag icon is labeled "Brown Bag Inclusion Conversations Series". The main heading is "Picture a Scientist" with a subtext "Learn stories of inclusion and exclusion for women in the Science field throughout the years and among your own peers and associates." Below this, there are two images: one of a woman in a lab coat and another of a person in a white lab coat sitting on a stool. The text "Images courtesy of Uprising, LLC" is below the images. On the right, an "Event Snapshot" section provides details: "When and Where" (March 19, 2021, 12:00 pm - 1:00 pm, Virtual). A "Register Now" button is at the top right.

March, 2021

Presentations & Workshops




Dina Newman, associate professor in the Thomas H. Gosnell School of Life Sciences, presented "The DNA Landscape": A Novel Framework for Teaching and Learning Molecular Genetics Concepts" at the X-DBER 2021 online conference hosted by the University of Nebraska - Lincoln. Co-authors of the talk included **Leslie Kate Wright**, associate professor in the Thomas H. Gosnell School of Life Sciences, and fourth-year Biotechnology & Molecular Bioscience undergraduate students **Emalee Wrightstone** and **Lauren Trumpore**.

March, 2021

Learning Assistant conversations

The Center for Advancing STEM Teaching, Learning and Evaluation - CASTLE held a session of their Learning Assistant Brown Bag Lunch Conversation series for students and mentors involved in the Learning Assistant program. The March discussion focused on Student Motivation – ways to help students stay motivated and how to actualize these ideas in the classroom.



March 10, 2021

College of Science: How Inclusive Do Staff Feel We Are?

RIT / RIT Life / Events / College of Science: How Inclusive Do Staff Feel We Are?



COS Staff Survey:

How Inclusive Do Staff Feel We Are?

March 18, 2021



April 21, 2021

Adapting Course-Based Research to Virtual Learning Environments to Make STEM Education Accessible to All Students



Inclusive Excellence Invited Speaker
Franco Delogu, PhD
Associate Professor of Psychology
Lawrence Technological University

April 21, 1:25-2:15 p.m.

April 30, 2021

Inclusive Excellence: Food Insecurity

Register Now
Add to Calendar



Food Insecurity

Inclusive Excellence Brown Bag

April, 2021

Inclusive Excellence hosts discussion groups

The [Inclusive Excellence](#) initiative hosted three programs in the month of April:

On April 16, COS faculty, staff, and students were invited to participate in a conversation about **Environmental Justice**. Participants discussed the common aspects of environmental justice and how it impacts the community where we live.

And on April 21, invited speaker Dr. Franco Delogu, associate professor of Psychology at Lawrence Technological University, joined the COS community to share strategies for creating learning environments that make STEM education accessible to all students using the [Course-based Undergraduate Research Experience](#) (CURE) model. CURE is an effective pedagogical model to increase enrollment, retention and graduation of historically underserved populations of students. The CURE model makes research activity an integral part of a regular course, so all students enrolled in the course can be included in the intervention, eliminating selection and self-selection constraints to research accessibility.

The month concluded with a discussion about **Food Insecurity**, facilitated by [Sharon Kompalla-Porter](#), director of the [RIT FoodShare Program](#). The RIT FoodShare, based on the RIT campus, was created in 2015 to help meet the needs of RIT students.

April, 2021

Andy Gonzalez, a double major in physics and applied mathematics and a student research fellow in the Inclusive Excellence program, won a poster award at the Microfluidics and Energy Symposium 2021 for “Exploring the Limits of Dynamic Permeability Modifications in Porous Media.” Gonzalez worked with Assistant Professor [Shima Parsa Moghaddam](#) in the Inclusive Excellence research mentoring program.




May 5, 2021

Computational Literacy: The Very Idea

[Register Now](#)
[Add to Calendar](#)

RIT / RIT Life / Events / Computational Literacy: The Very Idea



**Computational Literacy:
The Very Idea**

SMERC, EMS, & SoPA Seminar
Computational Literacy: The Very Idea

Dr. Andrea A. Olivas
Corey Professor Emerita of Education
University of California at Berkeley

What is computational literacy? Learn about this transformative achievement and how it is fundamental to our future society.

[Register Now for Zoom Link](#)

Abstract:
My central claim is that achieving a new literacy with computation is the very best thing we can imagine for the future of computers and

Event Snapshot

When and Where
May 05, 2021
1:30 pm - 2:30 pm
Virtual
Room/Location: See Zoom Registration Link

Who
Open to the Public

Interpreter Requested?
No

May 6, 2021 Virtual

Rochester Institute of Technology

About ▾ Academics ▾ Experiential Learning ▾ Admissions and Aid ▾ Research ▾ **RIT Life ▾** Athletics ▾

8th Annual CASTLE Symposium

[Add to Calendar](#)

RIT / RIT Life / Events / 8th Annual CASTLE Symposium



**8th Annual
CASTLE Symposium**

8th Annual CASTLE Symposium

Event is by Invite Only.

A virtual celebration of CASTLE's 2020-2021:

- Discipline-based Education Research
- Learning Assistant Program
- Inclusive Excellence Program Achievements
- CASTLE Collaborations and Highlights.

Celebrate together virtually our shared education research and program highlights of the past year.

Event Snapshot

When and Where
May 06, 2021
2:30 pm - 4:00 pm
Virtual
Room/Location: By Invite Only

Who
This is an RIT Only Event

Interpreter Requested?
No

Topics
[diversity](#) [faculty](#) [research](#)