



## SPRING 2018 NEWSLETTER

### IN THIS ISSUE

- Highlights from the Year
- News from the Canadian Journal of Science, Mathematics and Technology Education
- SMT Meeting Presentations
- Faculty News and Activities
- SMT Guest Speakers Series
- Recent Awards and Grants
- Congratulations to SMT Doctoral Graduates
- Members' Corner
- Upcoming Events

### DIRECTOR'S MESSAGE

What a productive year we have had in the SMT Centre community! I want to thank our past Director, Clare Brett, whose leadership promoted and supported a vibrant collective of faculty, students, alumni, and affiliates working together to share research ideas and developments. This year, the momentum has been maintained and we have welcomed members and friends to our various meetings and events. Our member meetings on the first Friday of every month have been popular venues to pitch research ideas, gain feedback on ongoing projects, and report on studies that have been completed. In 2017-2018 there were two Centre-funded collaborative research projects emerging from these meetings. In addition, our various Guest Speaker Presentations have been lively spaces of scholarly engagement. Our focus on improving SMT education remains steadfast and our members are doing some amazing work, a taste of which is presented in this newsletter. I hope that you had a chance to participate in some of our activities and discussions over the past year, and I invite you to continue to build the Centre with us into the future.



Carol-Ann Burke, Director, Centre for Science, Mathematics and Technology Education

### OUR MISSION

We are a Centre for excellence in science, mathematics, and technology (SMT) education: Undertaking research, development, and teaching that promote critical understanding, inclusion, diversity, equity, personal wellbeing, creativity, and social and environmental justice.

## HIGHLIGHTS FROM THE YEAR

### *Centre Research: Essential Characteristics of Interfaculty Collaboration*

As a result of various research and teaching collaborations, the Centre has developed a research study to explore the characteristics of interfaculty/interdepartmental collaborations. The study focuses on existing joint initiatives being undertaken between OISE's Department of Curriculum, Teaching and Learning, and the Faculty of Applied Science and Engineering. The first phase of the research examines the processes and perspectives associated with the various ways in which the different academic groups present the engineering component of the STEM education construct.

### *Centre Research: STEM Education*

A group of six OISE professors were selected to produce a research report on STEM Education for the Ontario Ministry of Education. The contract was procured through a proposal submitted by the SMT Centre Director on behalf of the research team: Michelle Dubek, Rebecca Hughes, Sheliza Ibrahim Khan, Christina Phillips, Mary Reid and Lesley Wilton.

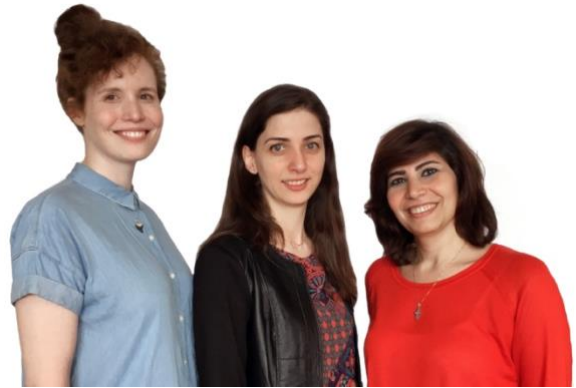
### *STEM Master of Teaching Workshops*

Faculty members from the SMT Centre and the Master of Teaching program worked alongside graduate students from OISE and the Faculty of Applied Science and Engineering, to prepare two STEM workshops for students in primary/junior and junior/intermediate divisions of the Master of Teaching program. These workshops provided an introduction to the field of Engineering, sharing examples of activities that the future teachers could offer to their K-12 students. The first workshop helped teacher candidates understand what engineering is, what engineers do, and what engineering could look like in the classroom. The second workshop focused on robotics and coding for K-12 learners. Both workshops were well-received by our Master of Teaching students. We wish to thank the workshop leaders: Stacy Costa, Alan Fong, Darlee Gerrard, Albert Huynh, Rubaina Khan, Ahmad Khanlari, and Majd Zouda. Thanks also go to faculty mentors Jane Forbes and Michelle Dubek.

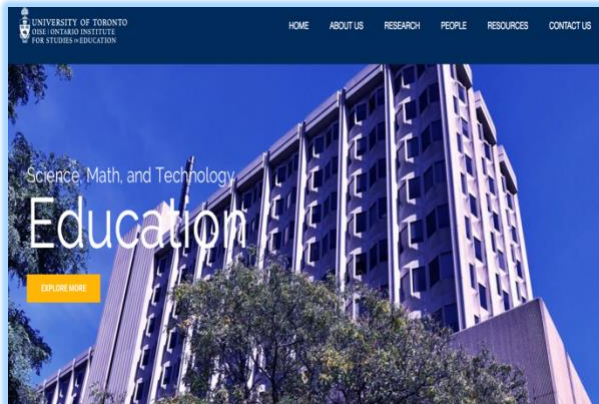


## *Student-Led Group: Café in Theory*

Starting as friendly, but critical, conversations at conferences and cafés, the idea of *Café in Theory* was born to expand these collegial discussions by involving graduate students at the University of Toronto in thinking about difficult philosophical ideas in a fun and relaxing café-style atmosphere. With support from the SMT Centre, Café in Theory was established by three Ph.D. students Kristen Schaffer, Sarah El Halwany and Majd Zouda (from left to right). The Café holds monthly meetings to discuss philosophical concepts related to science, research and education. If you would like to join the group, write to: [café.in.theory@gmail.com](mailto:café.in.theory@gmail.com)



## *A Sneak Peek at the New SMT Website*



The Centre has been busy updating its Information Technology infrastructure to align with the new vision for OISE web presence. Three volunteers: Paul Alexander, Renato Carvalho, and Joel Wiebe co-designed a striking new website that will be officially launched in the Fall of 2018.

In Winter of 2018, the Centre also spent time updating member information in order to provide better communication to students, faculty, and affiliates of the Centre on our new web platform.

## **E-MAIL LISTSERV**

During the winter term of 2018, the Centre made the necessary efforts to update and improve the subscription lists for its various listservs (student, faculty, alumni, and affiliate). These updates align the Centre with the necessary privacy legislations that govern the University of Toronto. These changes to the listserv memberships will be reflected when the Centre resumes activity in September of 2018. If you have not done so already, we invite you to sign up for our distribution list. You can do so [here](#).

## NEWS FROM THE CANADIAN JOURNAL OF SCIENCE, MATHEMATICS AND TECHNOLOGY EDUCATION (CJSMTE)

For almost 18 years, CJSMTE has been the flagship research publication of the SMT Centre. Founded by Derek Hodson, Gila Hanna, and Jacques Désautels, the journal has grown to become one of the major international voices in STEM education. After 10 successful years with Routledge/Taylor & Francis, the journal has changed publishers, and is now with Springer, one of the leading international publishing houses. We are very excited by this new development and are looking forward to a productive relationship with the new publisher. We will continue in our role as the journal of record for Canadian research in the field, as well as a bridge between national and international developments. We are also proud of our role in publishing research in both national languages, English and French. Please visit the journal's website (<https://www.springer.com/education+%&+language/science+education/journal/42330>) for more information, including submissions and subscriptions.

John Wallace (Editor-in-Chief)  
and the Editorial Team



**Canadian Journal of Science, Mathematics and Technology Education**  
Editor-in-Chief: J. Wallace

- ▶ One of the leading international journals in STEM education
- ▶ In its 18th year of publication
- ▶ Offers coverage of STEM education practices in Canada and internationally
- ▶ Publishes original research in a variety of styles
- ▶ Published in both English and French
- ▶ High quality and peer reviewed
- ▶ Listed in the Web of Science (Emerging Sources Index)

The *Canadian Journal of Science, Mathematics and Technology Education* is one of the leading international journals in the field of science, mathematics and technology education. Now entering its 18th year of publication, the journal offers high quality, peer reviewed articles covering a variety of topics in the field of STEM education, including indigenous education, environmental education, activism, nature of science, research competencies, mathematical giftedness, informal education, citizenship education, and engineering education. The journal is listed in the Web of Science and welcomes contributions in a variety of styles including research investigations, reviews of the literature, and position papers.

General correspondence should be addressed to the Editorial Assistant/Pour la correspondance d'ordre général/adresser au directeur adjoint Ontario Institute for Studies in Education of the University of Toronto/Institut d'études pédagogiques de l'Ontario de l'Université de Toronto 252 Bloor Street West, Toronto, ON, M5S 1V6, Canada

Email/courriel: [cjsmte@utoronto.ca](mailto:cjsmte@utoronto.ca)

Follow CJSMTE on Twitter at <https://twitter.com/cjsmte>

On the homepage of **Canadian Journal of Science, Mathematics and Technology Education** at [springer.com](https://www.springer.com) you can

- ▶ Sign up for our Table of Contents Alerts
- ▶ Get to know the complete Editorial Board
- ▶ Find submission information



4 issues/year

**Electronic access**

- ▶ [link.springer.com](https://link.springer.com)

**Subscription information**

- ▶ [springer.com/librarians](https://springer.com/librarians)

## SMT MEETING PRESENTATIONS

The Centre hosted several members' presentations between September 2017 and April 2018. The presenters included faculty, students, and affiliates of the Centre. A selection of the talks and presenters is listed below and we continue to invite members (particularly students completing thesis degrees) who wish to share ideas, or friends who would like to solicit feedback, to use the academic support available through the SMT Centre.

- John Percy: Connecting SMT to the Outside Universe
- Marlene Scardamalia: Knowledge Building Course Development
- Chirag Variawa: Engineering Education – First-year to Faculty
- Ana Maria Navas Iannini: Public Engagement with Critical Exhibitions – Insights from a Brazilian and a Canadian Science Museum
- Allison Ritchie: Participation, Positioning, and Power in a University Kinesiology Classroom
- Ronald Soong: Collaboration on STEM and Accessibility

## SMT GUEST SPEAKER SERIES

Throughout 2017/2018, we continued the tradition of hosting a number of invited guest presentations on contemporary issues in science, mathematics, and technology education. These presentations are summarized below.

**Speaker:** Martha Marandino, Associate Professor Faculty of Education, University of São Paulo, Brazil

**Presentation Title:** A Framework for Exploring Scientific Literacy in Museums

**Summary:** In this presentation, Martha introduced a theoretical tool for exploring scientific literacy in museums. Drawing from various theoretical approaches, the tool is composed of four indicators (scientific, institutional, social interface, and interaction) to explore science didactic/pedagogy in museums. The tool was developed by Martha and her Research and Study Group for Informal Education and Science Communication ([www.geenf.fe.usp.br](http://www.geenf.fe.usp.br)), at the Faculty of Education, University of São Paulo, Brazil.







**Speaker:** Mahtab Nazemi, Assistant Professor Thompson Rivers University

**Presentation Title:** Mathematics Education at the Intersection of Racial and Linguistic Identities - Challenges of Learning Mathematics in a Neo-Liberal Era

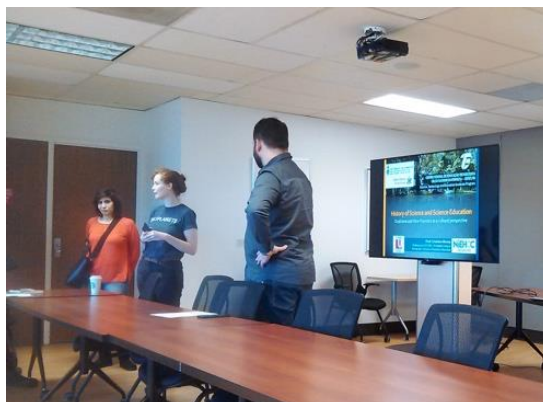
**Summary:** Mahtab's talk brought together sociocultural theories of learning and identities with critical race theory to uncover and demonstrate ways in which female students of colour negotiate and navigate their various intersecting identities while learning

mathematics. Students' experiences were examined against the larger social context of institutional racism and neoliberalism. Her talk concluded with a discussion around important implications for teachers and teacher educators, such as inquiring into the salience of race and racism for mathematics teaching and learning and engaging with students in conversations around race and racism, including assumptions regarding ability, as well as meritocratic and race-neutral discourse around success.

**Speaker:** Cristiano Moura, Professor of Science Education and Chemistry at the Federal Centre for Technological Education of Rio de Janeiro

**Presentation Title:** Seminar for Master of Teaching Science Students – History of Science and Science Education

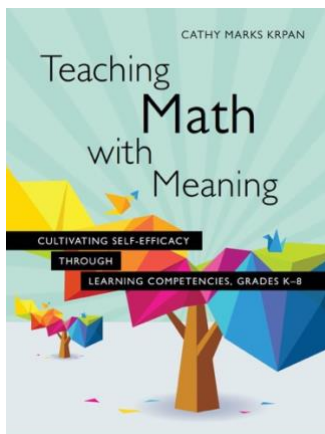
**Summary:** Co-hosted by the Café in Theory group, this seminar was presented for Master of Teaching students. Cristiano led the seminar by inviting teacher candidates to reflect on the purpose of teaching science in schools and the need for more socially conscious science education. He shared some cases and examples from science classrooms in Brazil, illustrating various ways that teaching about history and philosophy of science with relevance to students' lives might facilitate greater civic engagement.



## FACULTY NEWS AND ACTIVITIES

### Book Releases

**Larry Bencze** edited the volume *Science and Technology Education Promoting Wellbeing of Individuals, Societies and Environments, STEPWISE* (Springer, 2017). The collection comprises contributions by graduate students, current science researchers, and educators continuously researching ways to advance science education for social justice and environmental sustainability.



**Cathy Marks Krpan's** book, *Teaching Math with Meaning: Cultivating Self-Efficacy through Learning Competencies, Grades K–8* (Pearson, 2017), is a researched-based resource intended for leaders and educators who want to ensure that students develop deep learning of critical mathematical content in tandem with the learning competencies that underlie all aspects of the curriculum. Student examples are used throughout the book to illustrate knowledge acquisition.

### Visiting Scholar Activities

In Winter and Spring 2018, **John Wallace** has been a visiting scholar at the University of Toulouse in France in his capacity as Editor-in-Chief of the Canadian Journal of Science, Mathematics and Technology Education, supported by his SSHRC funded Support for Scholarly Journals grant. During this time, he has been pursuing the goals of the grant, actively promoting and advertising the journal among the Francophone academic community, soliciting manuscripts from established and emerging scholars, and meeting with journal board members about journal policy and direction (France has the largest number of board members outside of Canada). He has also been talking to groups of faculty and students about some of the topics being raised in recent issues of the journal, and possible future topics in the European context. To this end, he has made presentations to faculty and students at the University of Toulouse, the University of Montpellier, as well as a regional academic seminar in Narbonne.

During the Winter and Spring of 2018, **Erminia Pedretti** was a visiting scholar at the University of Toulouse, France. While there she met with faculty and graduate students, continued her SSHRC-funded research focusing on science centres and controversy, and presented an invited address: *Controversy in science museums: Reimagining exhibition spaces and practice*. Another invited address was given at the University of Montpellier, France, entitled: *Communicating controversy: Production, consumption and the changing landscape of science museums*.



In Fall of 2017 and Winter of 2018 **Erminia Pedretti** hosted Associate Professor Martha Marandino (a visiting scholar from the University of São Paulo in Brazil). Martha's research interests include science teacher education, science museums, controversy, and exhibition practices. Martha participated in the activities of the Centre, met with graduate students, and presented her research to the larger community.

## RECENT AWARDS AND RESEARCH GRANTS

### Awards

**Ana Maria Navas Iannini** is recipient of the 2018 Canadian Science Education Research Group (SERG) Outstanding Dissertation Award. Her thesis is entitled: *Public engagement with critical exhibitions: Insights from a Brazilian and a Canadian science museum*.

Thesis Supervisor: Erminia Pedretti

**Mary Reid** is recipient of the OISE 2018 Award for Excellence in Initial Teacher Education.

### Research Grants

**Carol-Ann Burke** [on behalf of the SMT Centre]. (2018). *STEM Research to Inform Curriculum Refresh*. Ontario Ministry of Education Research Service Grant. \$24,986.

**Carol-Ann Burke** (2017-2019). *Engaging children and youth from low-income communities in science learning*. Council of Ontario Directors of Education. \$219,803.

**Sarah El Halwany** (2017-2018). *Towards supporting students' emotional sense-making on STSE issues*. Ontario Graduate Scholarship (OGS). \$15,000.

**Jim Hewitt & Clare Brett** (2018). *Academic Toolbox Enhancements for Pepper*. University of Toronto Instructional Technology Innovation Fund (ITIF). Support Stream Funding up to \$20,000.

**Ahmad Khanlari** (2017-2019). *Collaborative knowledge networks to facilitate knowledge building in robotics: A longitudinal study*. SSHRC Doctoral Fellowship. \$40,000.

**Gurpreet Sahmbi** (2017-2018). *Solving the equation: Investigating factors impacting student success in calculus in science and engineering programs*. Ontario Graduate Scholarship (OGS). \$15,000.










## CONGRATULATIONS TO 2017/2018 SMT DOCTORAL GRADUATES

Steven Paul EHRICK	<i>Building learning community in post-secondary large lecture courses: A blended approach to fostering communities of learners</i> Supervisor: James Slotta
Asal ASLEMAND	<i>Undergraduate social sciences students' attitudes toward statistics</i> Supervisor: Douglas McDougall
Ana Maria NAVAS IANNINI	<i>Public engagement with critical exhibitions: Insights from a Brazilian and a Canadian science museum</i> Supervisor: Erminia Pedretti
Heather Janette SPICER BIRCH	<i>Participatory design of a mobile tool to support piano pedagogy and practice</i> Supervisor: Clare Brett
Martha Wendy YOUNGER	<i>Spatial skills activities in the middle school mathematics teachers toolkit: The impact of spatial skill activities on mathematical thinking</i> Supervisor: Douglas McDougall
Ying CHEN	<i>Teacher experience and teacher identity: A case study of three math teachers learning to teach in a Canada-China reciprocal learning project</i> Supervisor: Douglas McDougall
Melanie Christine PRYDATKEWYCZ CHWYL	<i>Shared e-book reading in a children's museum: Discovery of family interactions</i> Supervisor: Clare Brett
Sijia (Cynthia) ZHU	<i>Reciprocal learning partnerships between elementary mathematics teachers: A partnership between Canada and China</i> Supervisor: Douglas McDougall
Robert Douglas WALTERS	<i>Investigating the combined impact of cognitively guided instruction and backward design model in mathematics on teachers of Grade 3 students</i> Supervisor: Douglas McDougall
Daniel LUMSDEN	<i>Flipping the secondary mathematics classroom: Teachers' perceptions on the use of video instruction</i> Supervisor: Douglas McDougall

## MEMBERS' CORNER

### SMT Faculty Profiles

<p><b>Larry Bencze</b></p>  <p><b>Research Interests:</b> Actor-network theory; political economy; socio-political activism; history, philosophy &amp; sociology of science.</p>	<p><b>Clare Brett</b></p>  <p><b>Research Interests:</b> Digital technologies; their pedagogical implementation &amp; learning and social consequences</p>
<p><b>Carol-Ann Burke</b></p>  <p><b>Research Interests:</b> Science education; postcolonial theory in science education; underrepresented youth in science; cultural context of science education</p>	<p><b>Michelle Dubek</b></p>  <p><b>Research Interests:</b> Science education; STEAM; assessment in interdisciplinary education; informal learning; teacher education</p>
<p><b>Greg Evans</b></p>  <p><b>Research Interests:</b> Engineering education; Urban air quality and air pollution; energy systems and climate</p>	<p><b>Wanja Gitari</b></p>  <p><b>Research Interests:</b> Access and equity in science education; application of school science in everyday life</p>
<p><b>Gila Hanna</b></p>  <p><b>Research Interests:</b> Mathematics education; mathematical proofs; gender and mathematics education</p>	<p><b>Jim Hewitt</b></p>  <p><b>Research Interests:</b> Educational technology; computer-supported learning environments; electronic discourse; distance education; online communities</p>

## Sheliza Ibrahim Khan



**Research Interests:**  
Science education; STEM;  
place-based education;  
science communication

## Cathy Marks Krpan



**Research Interests:**  
Math education; mathematical  
argumentation; self-regulated  
learning; student and teacher  
mathematical discourse; teacher  
and student self-efficacy in  
mathematics

## Doug McDougall



**Research Interests:**  
Math education; teacher  
education; technology;  
teacher collaboration;  
reciprocal learning

## Erminia Pedretti



**Research Interests:**  
STSE education;  
environmental and outdoor  
education; action research;  
teacher professional  
development; formal and  
informal science settings

## John Percy



**Research Interests:**  
Astronomy and astrophysics;  
formal and informal astronomy  
education at all levels

## Christina Phillips



**Research Interests:**  
Science education;  
environmental education;  
current and critical issues  
in curriculum; socio-  
cultural perspectives;  
discourse analysis

## Mary Reid



**Research Interests:**  
Math teacher education,  
math content knowledge of  
elementary pre-service  
teachers; math anxiety;  
math efficacy; gender and  
race gaps in math  
performance in STEM

## Jim Slotta



**Research Interests:**  
Technology-enhanced  
learning environments;  
learning communities;  
science education

## John Wallace









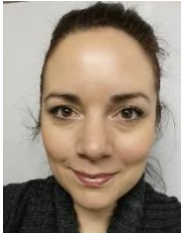



**Research Interests:**  
Curriculum integration,  
teacher learning; STEM;  
qualitative research











## Lesley Wilton



**Research Interests:**  
Teaching with technology;  
online teaching and learning;  
social practices; new  
literacies; pre-service  
teaching

## SMT Student Profiles

<p><b>Thelma Akeya</b></p>  <p>Research Interests: Black Canadian women in physics</p>	<p><b>Paul Alexander</b></p>  <p>Research Interests: Educational/immersive technology</p>
<p><b>Pamela Brittain</b></p>  <p>Research Interests: Mathematics (elementary and pre-service teachers)</p>	<p><b>Jennifer Calix</b></p>  <p>Research Interests: Grades K-8 mathematics and technology research</p>
<p><b>Stacy Costa</b></p>  <p>Research Interests: Math; Knowledge Building; STEM; collaborative learning; computational thinking; authoritative sources; innovation in schools</p>	<p><b>Sarah El Halwany</b></p>  <p>Research Interests: Affect/emotions in science education; STSE education</p>
<p><b>Darlee Gerard</b></p>  <p>Research Interests: Science/engineering/STEM education; experiential and co-curricular learning; access to/equity in education leadership/outdoor/environmental education</p>	<p><b>Sasha Gollish</b></p>  <p>Research Interests: Engineering education; mathematics</p>
<p><b>Nurul Hassan</b></p>  <p>Research Interests: STEM; STSE and science education</p>	<p><b>David Hung</b></p>  <p>Research Interests: Mathematics education</p>

<p><b>Rubaina Khan</b></p>  <p>Research Interests: Engineering education; learning theory</p>	<p><b>Ahmad Khanlari</b></p>  <p>Research Interests: Robotics; STEM education; knowledge building; learning analytics</p>
<p><b>Nadia Qureshi</b></p>  <p>Research Interests: Decolonizing science education in adult literacy programs</p>	<p><b>Tasha Richardson</b></p>  <p>Research Interests: Physics education; digital game-based learning</p>
<p><b>Gurpreet Sahmbi</b></p>  <p>Research Interests: Mathematics education</p>	<p><b>Kristina Salciccioli</b></p>  <p>Research Interests: Inner city science education</p>
<p><b>Kristen Schaffer</b></p>  <p>Research Interests: STSE education</p>	<p><b>Sadia Sharmin</b></p>  <p>Research Interests: Computer science education</p>
<p><b>Erin Sperling</b></p>  <p>Research Interests: Ecojustice education; civic engagement; STSE activism; community building</p>	<p><b>Majd Zouda</b></p>  <p>Research Interests: Activist science education; STSE/socioscientific issues; STEM education; elite schools; action research; critical discourse analysis</p>

*Affiliate and Alumni Members*

Affiliates: Sarah Aldous; Cresencia Fong; Jason Foster; Einat Gil; Martha Marandino; Elham Marzi; Melody Neumann; Andrew Petersen; Angela Schoeling; Chirag Variawa

Alumni: Alex Bing; Limin Jao; Brenda McLoughlin; Ana Maria Navas Iannini; Zoya Padamsi; Lucia Rosatone; Jason To; Zhaoyun Zhao



## Selected Member Publications for 2017/2018

(\*indicates student authorship; member names in bold)

\*Atkinson, D., **\*Navas Iannini, A.M.**, & **Pedretti, E.** (2017, May). "Different groups are particularly sensitive about things like that": Visitors experience a controversial science exhibition. Paper presented at the annual meeting of the Canadian Society for Studies in Education (CSSE), Toronto, ON.

\*Atkinson, D., **Pedretti, E.**, & **Navas Iannini, A. M.** (2018, April). Animal Inside Out: Controversies, objects and participants' experiences at a science museum. Paper presentation at the annual meeting of the American Educational Research Association (AERA). New York, NY.

Bellomo, K., & **Pedretti, E.** (2017, May). Muddying the waters: Environmental education through practice-theory disruptions. Paper presented at the annual meeting of the Canadian Society for Studies in Education (CSSE), Toronto, ON.

**Bencze, J. L.** (Ed.). (2017). *Science & technology education promoting wellbeing for individuals, societies & environments: STEPWISE*. Dordrecht, The Netherlands: Springer.

[Note: several graduate students have chapters in this book.]

**Bencze, L.**, **\*El Halwany, S.**, Krstovic, M., Milanovic, M., **Phillips-MacNeil, C.**, & **\*Zouda, M.** (2018). Estudantes agindo para resolver danos pessoais, sociais & ambientais ligados à ciência & tecnologia / Students acting to address personal, social & environmental harms linked to science & technology. In N. Nunes-Neto & D.M. Conrado (Eds.), *Questões sociocientíficas: Fundamentos, propostas de ensino e perspectivas para ações sociopolíticas / Socioscientific Issues: Foundations, teaching proposals and perspectives for sociopolitical actions* (pp. 515-560). Salvador, Brazil: Editora da Universidade Federal da Bahia.

**Bencze, L.**, Reiss, M., Sharma, A., & Weinstein, M. (2018). STEM education as 'Trojan horse': Deconstructed and reinvented for all. In L. Bryan & K. Tobin (Eds.), *13 questions: Reframing education's conversation: Science* (pp. 69-87). New York: Peter Lang.

Birch, H.S., & **Brett, C.** (2018, April). Pedagogy and practices within a distributed affinity space for music learning. Paper presented at the annual meeting of the American Educational Research Association (AERA), New York, NY.

Brandmann, T., Fakim, H., **Padamsi, Z.**, Youn, J. Y., Gingras, A. C., Fabian, M. R., & Jinek, M. (2018). Molecular architecture of LSM14 interactions involved in the assembly of mRNA silencing complexes. *The EMBO journal*, e97869. doi: 10.15252/embj.201797869

**Burke, L. E. C.**, & Wessels, A. (2017, May). *Urban high school students expose the pedagogical implications of science theatre*. Paper presented at the Canadian Society for the Study of Education (CSSE) Annual Conference, Toronto, ON.

**Burke, L. E. C.** (Ed.). (2017). Dialogues on beauty through STEM education: Graduate student special issue. [Special Issue]. *Journal for Activist Science and Technology Education (JASTE)*, 8(1).

[Note: OISE graduate students feature as authors in this issue.]

**\*Costa, S. A.** (2017, June). *Puzzle-based learning: An approach to creativity, design thinking & problem solving. implications for engineering education*. Paper presented at the Canadian Engineering Education Conference, Toronto, ON.

**Dubek, M.,** Doyle-Jones, C., de Castell, S., & **\*Nicholishen, E.** (2018, April). "It all came together." Co-planning, co-teaching and co-learning for 21st century STEM education. Paper presented at the annual meeting of the American Educational Research Association (AERA), New York, NY.

**Dubek, M., Reid, M.,** Hughes, R., **Ibrahim Khan, S., Phillips, C., & Wilton, L.** (2018). *A review and analysis of STEM education: A report for the Ontario Ministry of Education*. Unpublished report. Centre for Science, Math and Technology Education, Ontario Institute for Studies in Education, University of Toronto, Toronto, Canada.

**\*El Halwany, S., \*Zouda, M.,** Pouliot, C., & **Bencze, L.** (2017). Supporting pre-service teachers to teach for citizenship in the context of STSE issues. In **L. Bencze** (Ed.), *Science and Technology Education Promoting Wellbeing for Individuals, Societies and Environments: STEPWISE* (pp. 405–427). Dordrecht, The Netherlands: Springer.

**Evans G.** (2017, October). *Moving entropy and elements from chaos to connections: Teaching chemical engineering in turbulent times*. Keynote presented at the Canadian Society for Chemical Engineering Conference, Edmonton, AB.

**Evans, G.** (2018, March). *The long and winding road: Finding our path as educators*. Invited talk made to Ryerson University, Toronto, ON.

**Evans, G.,** Allen, G., Bender, T., & Cluett, W. (2017, June). *We never talk: peer to peer observation and formative feedback as steps to evolving academic culture*. Paper presented at the Canadian Engineering Education Conference, Toronto, ON.

Florence, S., **\*Gerrard, D.,** & DeCoito, I. (2017, May). *STEM outreach workshops: Fostering curiosity in middle school students*. Paper presented at the annual meeting of the Canadian Society for the Study of Education (CSSE), Toronto, ON.

**\*Gerrard, D.,** Newfield, K., & Variawa, C. (2017, June). Are students overworked? Understanding the workload expectations and realities of first-year engineering. Paper presented at the annual meeting of the American Society for Engineering Education (ASEE), Columbus, Ohio.  
[Nominated for Best Paper in First Year Programs Division.]

**Gil, E.,** & Gibbs, A. L. (2017). Promoting modeling and covariational reasoning among secondary school students in the context of big data. *Statistics Education Research Journal*, 16(2). Retrieved from [https://iase-web.org/documents/SERJ/SERJ16\(2\)\\_Gil.pdf](https://iase-web.org/documents/SERJ/SERJ16(2)_Gil.pdf)

**Gitari, W.** (2017, November). *Inclusion in the science class: An inside-out view*. Presentation made at the Science Teachers Association of Ontario (STAO), Toronto, ON.

**Gitari, W.,** & **\*Gerrard, D.** (2017). Prioritizing scientific discourse by adult learners: An analysis of student writing using Bloom's Taxonomy. *The International Journal of Adult, Community and Professional Learning*, 24(1), 15-30.

**Gollish, S.,** Tihanyi, D., **Costa, S.,** Memarian, B., Moozeh, K., **\*Gerrard, D.,** & Newfield, K. (2017, June). Experiencing engineering education: An analysis of the experience of the comprehensive doctoral examination in a unique collaborative graduate program. Paper presented at the annual meeting of the Canadian Engineering Education Association (CEEA), Toronto, ON.

**Hanna, G.** (2017, December). *Connecting two different views of mathematical explanation*. Paper presented at the workshop Enabling Mathematical Cultures, University of Oxford, Oxford, England.

**Hanna, G.** (2018) Reflections on proof as explanation. In Stylianides, A. J. & Harel, G. (Eds.), *Advances in mathematics education research on proof and proving: An international perspective (ICME-13 Monographs)*, (pp. 3-18). New York, NY: Springer.

**Jao, L., \*Sahmbi, G.,** & Huang, Y.S. (2018). *Preservice teachers as teaching assistants in a teaching methods course: A unique context for professional growth*. Paper presented at the American Education Research Association (AERA) conference, New York; NY.

**Jao, L., \*Sahmbi, G.,** & Huang, Y.S. (2018). *"I would've been a lost puppy": Communities of practice to support novice teacher educators*. Paper presented at the American Education Research Association (AERA) conference, New York; NY.

**\*Khanlari, A.** (2017). Play and learn. In M. Blathere & J. Cummings (Eds.), *Creative practices in curriculum and teaching in the 21st century*, (pp. 261-267). Boston, MA: Sense Publishers.

**\*Khanlari, A.** (2018, March). *Knowledge building discourse analyzer: A new tool to explore if students build their knowledge through discourse*. Paper presented at the 8th International Conference on Learning Analytics and Knowledge. Sydney, Australia.

**\*Khanlari, A., & \*Costa, S. A.** (2017, June). Criss-crossing stem fields through knowledge building discourse: An explanatory study. Paper presented at the Canadian Engineering Education Conference, Toronto, ON.

**\*Khanlari, A.,** Resendes, M., Zhu, G., & Scardamalia, M. (2017). Productive knowledge building discourse through student-generated questions. In the B. K. Smith, M. Borge, E. Mercier, & K. Y. Lim (Eds.), *Proceedings of the 12th International Conference on Computer Supported Collaborative Learning (CSCL) 2017* (pp. 585-588). Philadelphia, PA: International Society of the Learning Sciences.

**Marks Krpan, C.** (2017). *Teaching Math with Meaning: Cultivating Self-Efficacy through Learning Competencies, Grades K–8*. Toronto, ON: Pearson.

**\*Navas Iannini, A.M., & Pedretti, E.** (2017, May). Sexuality outside school: When dialogue meets participation and action in a science museum exhibit. Paper presented at the annual meeting of the Canadian Society for Studies in Education (CSSE), Toronto, ON.

Nazir J., & **Pedretti E.** (2018) Environmental education as/for environmental consciousness Raising: Insights from an Ontario Outdoor Education Centre. In G. Reis & J. Scott (Eds.), *International perspectives on the theory and practice of environmental education: A reader*. Environmental discourses in science education, Vol 3 (pp.85-98). Cham, Switzerland: Springer.

**Padamsi, Z.** (2018). Why pursue STEM when we Have STSE? A Canadian perspective. *Journal for Activist Science and Technology Education*, 8(1), 18-20.

**Pedretti, E., & \*Navas Iannini, A. M** (2018). Pregnant pauses: Science museums, schools and a controversial exhibition. In R. Gunstone, D. Corrigan, & A. Jones (Eds.), *Navigating the changing landscape of formal and informal science learning opportunities* (pp. 26-44). Dordrecht: The Netherlands: Springer.

**Percy, J. R.** (2017, June). *Forty years of linking variable star research with STEM education*. Paper presented at the Robotic Telescopes, Student Research, and Education Conference, San Diego, CA. [To be published in conference proceedings; also available at <https://arxiv.org/ftp/arxiv/papers/1710/1710.04492.pdf>]

**Percy, J.** (2017). Public libraries as partners in astronomy outreach. *Communicating Astronomy with the Public (CAP)*, 22, 5-8.

**Percy, J. R.** (2017). Science 'culture' in Canada. *Journal of the Royal Astronomical Society of Canada*, 111, 186-187.

**Reid, M., Reid, S., & Hewitt, J.** (2018). Nervous about numbers: Math content knowledge and math anxiety of teacher candidates. [Special Issue]. *Master of Teaching Journal*. Ontario Institute for Studies in Education.

**Reid, M., & Reid, S.** (2018, April). Transforming teacher candidates' beliefs about math: A collaborative journey in self-study. Paper presented at the Global Conference on Education and Research, University of Las Vegas, NV.

**Reid, M., & Reid, S.** (2017). Learning to be a math teacher: What knowledge is essential? *International Electronic Journal of Elementary Education*, 9(4), 851-872.

Rennie, L., Venville, G., & **Wallace, J.** (2018). Making STEM curriculum useful, motivating and relevant for students. In R. Jorgensen & K. Larkin (Eds.), *STEM in the junior secondary: The state of play* (pp. 91-109). Singapore: Springer.

Rennie, L., Venville, G., & **Wallace, J.** (2018). Natural disasters as unique socioscientific events: Curricular responses to the New Zealand earthquakes. In D. Corrigan, C. Bunting, A. Jones, A. & J. Loughran (Eds.), *Navigating the changing landscape of formal and informal science learning opportunities*. Dordrecht, The Netherlands: Springer.

**\*Sahmbi, G., Zhu, S., & McDougall, D.** (2018). *Building connections between middle and secondary school mathematics through co-created professional development*. Poster presented at the American Education Research Association (AERA) conference, New York; NY.

**\*Schaffer, K., Milanovic, M., \*El Halwany, S., \*Hassan, N., \*Zouda, M., & Bencze, L.** (2017, August). Inertial tensions in promoting socio-political actions among future technoscience technicians. Paper presented at the European Science Education Research Association (ESERA) conference, Dublin, Ireland.

Shanahan M., & **Burke, L. E. C.** (2017). Video analysis of role and identity in science classrooms through student and teacher pronoun use. *SAGE Research Methods Cases*.  
doi: <http://dx.doi.org/10.4135/9781473970571>

**Wilton, L., Brett, C., & Hewitt, J.** (2018, April). Examining pre-service and non-pre-service students' online course participation patterns. Paper presented at the annual meeting of the American Educational Research Association (AERA), New York, NY.

Yan, X., **Hanna, G.**, & Mason, J. (2018, April). *What's the story? Key idea(s) in proof in undergraduate mathematics*. Paper presented at the annual meeting of the American Educational Research Association (AERA), New York, NY.

**\*Zouda, M.** (2018). Issues of power and control in STEM education: A reading through the postmodern condition. *Cultural Studies of Science Education*. doi 10.1007/s11422-017-9820-6

**\*Zouda, M., \*El Halwany, S., Milanovic, M., & Bencze, L.** (2017, August). Addressing socioscientific issues through STEM education: The case of STEM coaches. A paper presented at the European Science Education Research Association conference, Dublin, Ireland.

**\*Zouda, M., \*El Halwany, S., Milanovic, M., \*Schaffer, K., & Bencze, L.** (2018, April). Activist science education: Spaces for equity and inclusiveness. A paper presented at the annual conference of American Educational Research Association (AERA), New York, NY.



## UPCOMING EVENTS

### AERA 2019 Prep Session

The American Educational Research Association (AERA) conference will be in Toronto in April 2019!

SMT students are invited to attend an information/peer support session on **Friday June 29, 2018 in room 11-164 from 4:00 pm to 5:30 pm**. Materials will not be made available outside of this session.

AERA submissions are now open until July 23, 2018. For more information, check the AERA website [here](#).

### Students' Research Celebration

Look out for email updates regarding an event that will feature current thesis-track students' research to celebrate their achievements and to welcome new incoming students into our programs. Current students should start preparing posters to summarize their research work.

## ACKNOWLEDGEMENTS

This newsletter was prepared with the support of Antoine Despres-Bedward (Graduate Assistant), Sarah El Halwany (Research Assistant), and Lisa Juan (Research, Partnerships and Communications Officer).

Information presented in this newsletter covers the period from May 2017 to April 2018 (inclusive) and members have restricted themselves to no more than three publications each to provide a sample of their work.