



Bridging the Gender Gap in STEM through Outreach & Professional Development

Program of the NSERC Chair for Women in Science and Engineering - Atlantic Canada

Part I
2011-2017

Edited by

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www.WISEatlantic.ca

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Forward

Dear Reader,

When I was awarded the NSERC Chair for Women in Science and Engineering - Atlantic Canada position in 2011, I did not predict the huge impact this position would have on women and girls in the region. Neither did I predict the huge impact it would have on my own career. This book highlights the work conducted by myself and my amazing team over the first five year term of this Chair position.

I would like to express my sincere gratitude to Mount Saint Vincent University (MSVU) for nominating me for this award and the Natural Sciences and Engineering Research Council of Canada (NSERC) for establishing this award in 1996. MSVU and NSERC together with Eastlink provided the financial support for this Chair position. We also worked closely with our in-kind partners, Techsploration, Nova Scotia Community College, Firefly Digital Media Inc, Girl Guides of Canada - Nova Scotia Chapter and Nikon Canada. All of which have been instrumental in the success of the WISEatlantic program. Other partners and sponsors joined us as our program established itself in the region as you will read on the next pages. These collective efforts have ensured our success.

Over the last five years, I have met some amazing individuals! People who have inspired me, and also my team, to continue our efforts to support women in Science, Engineering, Trades and Technology across Atlantic Canada. Thank you for sharing your experiences and perspectives with us.

To this women in SETT, I say keep moving forward. You will be helped along by the crowds behind you and the pioneers before you. To girls in school, please don't let anyone say you can't be a SETT professional. These are extremely rewarding careers and Canada needs you! To the men and women reading this book, I say if you do one thing, let it be that you become aware of your unconscious biases towards others.

Sincerely,

*Dr. Tamara Franz-Odendaal
Professor at Mount Saint Vincent University &
NSERC Atlantic Chair Women in Science & Engineering*

Acknowledgements

A sincere thank you to the sponsors and partners of the NSERC Chair for Women in Science and Engineering for the Atlantic Region from 2011 - 2017.



About WISEatlantic



The WISEatlantic program was launched in October 2011 with the aim of supporting women in Science, Engineering, Trades and Technology (SETT).

The goals of the WISEatlantic program are:

- To establish an Atlantic network for women in science and engineering
- To develop and run a series of science camps and workshops to encourage young girls to pursue careers in science and engineering, to expose them to hands-on science and math based activities, and to enable them to meet female role models in SETT fields
- To support women in the SETT fields in the workplace via professional development workshops and conferences
- To track young decision makers by analyzing the decision-making strategies used by girls while they grapple with their career decisions

Team Members

Chair: Dr. Tamara Franz-Ondendaal

Dr. Tamara Franz-Ondendaal is a Professor of Biology and the NSERC Chair for Women in Science and Engineering for Atlantic Canada (CWSE), at Mount Saint Vincent University, Nova Scotia. Dr. Franz-Ondendaal is one of five NSERC CWSEs in Canada. She leads the WISEatlantic Program as well as her research program in skeletal biology.

Program Coordinator: Sally Marchand (2013-2017)

Tanya Poulton (2011-2013)

Program Assistants: Jeanette McPherson (2014-2017)

Emily Nielsen (2016-2017)



Back: Tamara, Jeanette; Front: Emily, Sally

Highlights: Impacts and Outreach

WISEatlantic Programs have connected, and supported women in Science, Engineering, Trades and Technology (SETT). WISEatlantic has linked girls with role models in the SETT fields, and has created unique programs to engage girls in science through one day retreats, and summer camps. Our broad and creative programming has allowed WISEatlantic to have an extensive reach throughout the Atlantic provinces.

Over the past five years, WISEatlantic has...



Inspired Students

- Developed and launched the annual all-girls week-long **Girls Get WISE Science Summer Camp** which has been delivered **5** times.
- Established and delivered **20** all-girls, one-day, **Girls Get WISE Science Retreats**, which has connected 1053 girls with almost 200 female role models in STEM.
- Directly engaged 2,220 youth in other outreach activities including library sessions, webinars, school visits, and Science days.



WISEatlantic has directly engaged with over **2,300** girls in science, trades, technology and engineering!



"I feel that the WISE event made my daughter's world a bit broader than her public school science class. Being around so many women in Science enforced for her the fact that she really can do just about anything she wants to."

-Parent of Past Participant



WISEatlantic conducted research providing valuable insight on students in grades 7 to 12 as they begin to make career decisions.

Engaged Teachers & Parents

- Developed **14** role model videos for the Women in Action online video series, in concert with several sectoral partners. This includes development of teacher lesson plans and transcripts for the classroom.
- Collated and created STEM resources for youth, teachers, parents and role models.



WISEatlantic has engaged over 2,100 teachers, parents, and professionals!

Supported Women in STEM



- Hosted and sponsored **23** WinSETT professional development workshops
- Established regional connection nodes across the region and chaired quarterly teleconferences
- Organized three Step-Up professional development workshops for female academics in SETT
- Organized and hosted the first and second Atlantic Connections Conference (June 2015, May 2017) to develop networks, share stories and experiences, and develop plans of action to support women in SETT.

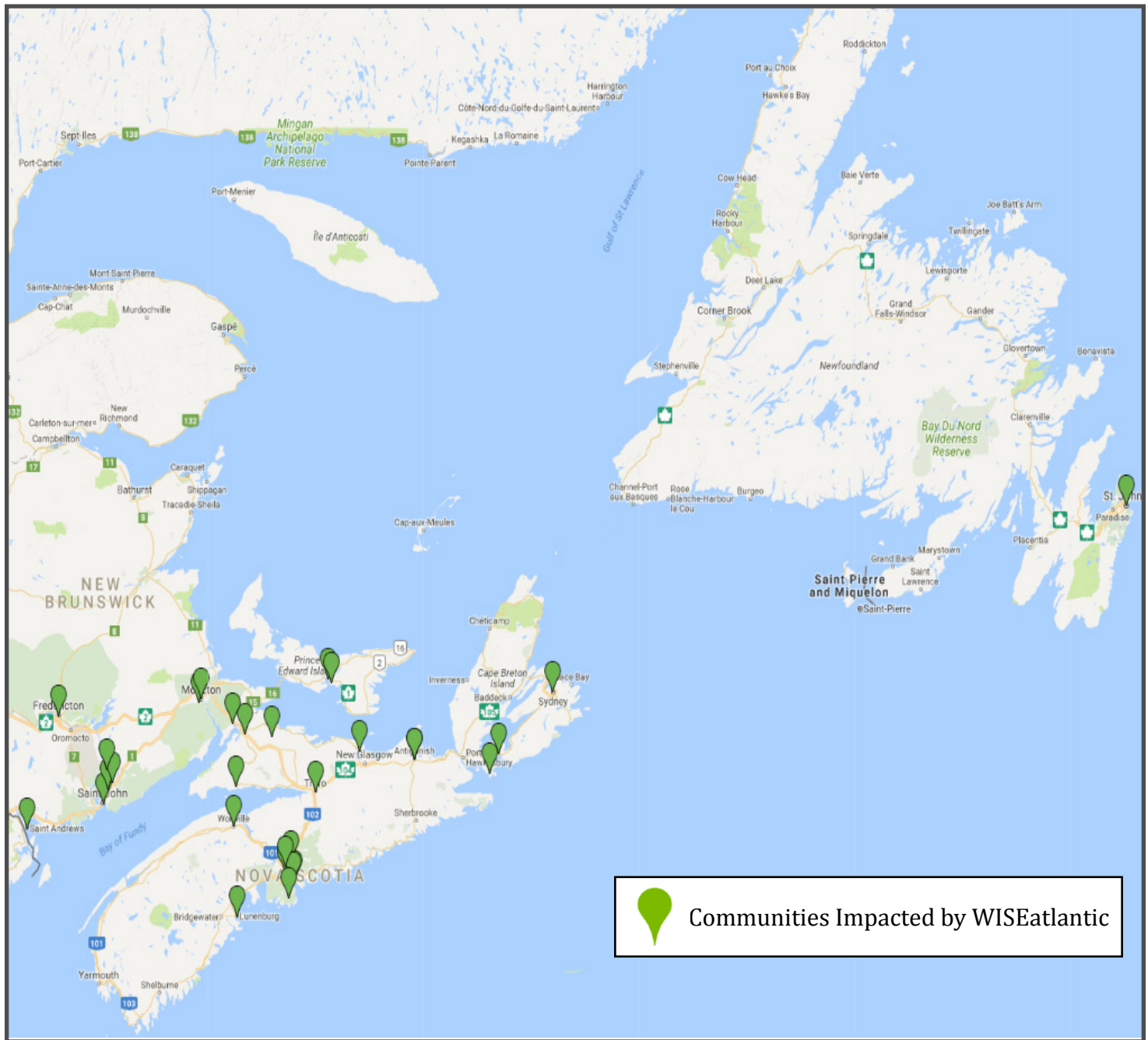
"As a student, I did not realize the struggle associated with being a woman in science but I believe I know how to approach these issues through meeting such influential and impressive women."

- 2015 ACT Conference Participant



WISEatlantic supported close to 500 women working in SETT, especially those in the early stages of their careers through professional development opportunities.

Impact Map



Since 2011, WISEatlantic has impacted 30 communities in Atlantic Canada, and has reached over 16,000 Atlantic Canadians.

Website and Social Media

The WISEatlantic website, www.WISEatlantic.ca comprises the backbone of our communication strategy. Here, we provide up-to-date news on our activities, share information about other activities in the region, and raise awareness on publications and reports on women in STEM in Canada. The website features specific pages for our target demographics, namely students, teachers, and role models. Through the role model sign-up page on our website, we have gained over 115 female role models in SETT careers interested in volunteering at our events and mentoring girls in the region.

The WISEatlantic website has had over 3500 unique visits since its launch in 2011.



WISEatlantic has worked to establish an active social media presence. Our Facebook page was launched in early 2012 with Twitter following in 2013, and Instagram in 2016. We currently have received over 600 likes on Facebook, and over 60 Instagram followers. On Twitter we have currently over 670 followers, and have tweeted more than 1300 times.

We have worked to engage with the media throughout our activities. To date, Dr Franz-Odendaal and her WISEatlantic program have had over 130 media appearances and features including on: blogs, television, magazines, websites, and in print. Of these media features, Dr. Franz-Odendaal has been interviewed for 16 television segments, 15 radio broadcasts, and over 30 print sources.



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Selected Presentations

- *Be inspired: Discover Exciting Career.* March 2017. Girls Conference. Mount Saint Vincent University, NS.
- *Gender in STEM: Does It Matter?* December 2016. Mount Allison University, NB.
- *Engaging Girls in the Technology Classroom.* August 2016. Teach Today for Tomorrow Teachers Tech Conference, NS.
- *Supporting Women in Chemistry.* June 2016. Chemical Institute of Canada Conference, NS.
- *Promoting Women in Academia through Career Development.* May 2016. CCWESTT Conference, ON.
- *Engaging Young Girls in STEM throughout Canada.* May 2016. CCWESTT Conference, ON.
- *Insight into Impact: An Analysis of the Impact of the WinSETT Workshops.* May 2016, CCWESTT Conference. ON.
- *Perspectives on Women in STEM.* April 2016. University of Waterloo Biology Graduate Symposium, ON.
- *Bias in Academia.* March 2016. Women in Leadership Forum. Dalhousie Agricultural Campus, NS.
- *Myths about girls in STEM.* March 2016. Girls Conference. MSVU, NS
- *Women in STEM in Academia.* November 2015. Science Atlantic Board Meeting, NS.
- *Why we should be encouraging Girls in STEM and How to Do it.* October 2015. Nova Scotia Association of Science Teachers (AST) Annual Conference, NS.
- *Why we should be encouraging Girls in STEM and How to Do it.* October 2015. Guidance Counselors Symposium. MSVU, NS.
- *Girls in Science, Technology, Engineering and Math (STEM) and Career Intentions, Influencers, & STEM Career Awareness.* August 2015. Teaching and Learning Showcase. MSVU, NS.
- *Women in STEM.* November 2014. Faculty Association Meeting. Dalhousie Agricultural Campus, NS.
- *Call to Action: NSERC Chairs.* May 2014. CCWESTT Conference, SK.
- *Are you creative? Find out about rewarding careers.* March 2014. Girls Conference. MSVU, NS.
- *All About Bones: Insights from Fossils & Embryos.* April 2014. WISENL Statoil Seminar Series, NFLD.
- *Career Choices and Influencers.* January 2014. Research Sharing Event. MSVU, NS.
- *A Business Case for Women in STEM.* November 2013. Engineers PEI Lunch and Learn, PEI.
- *Women in STEM: Towards Increasing the Numbers.* November 2013. UPEI, PEI.
- *Expanding Career Awareness within STEM Fields.* October 2013. Guidance Counsellor's Symposium, MSVU, Halifax
- *Overview of the NSERC Chairs Program.* October 2013. Guidance Counselors Symposium. MSVU, NS.
- *A Business Case for Increasing Women in STEM Professions.* October 2013. Chemical Engineering Conference. UNB, NB.
- *Supporting Gender Diversity in the Classroom and Workplace.* September 2013. Acadia University, NS.
- *Promoting STEM for Jr. High and Sr. High School Girls.* October 2012. School Counselors Symposium. MSVU, NS.
- *Zebrafish in the Classroom.* October 2012. Nova Scotia AST Annual Conference, NS.
- *Overview of the NSERC Chairs Program.* March 2012. Faculty Dialogue Series. MSVU, NS.
- *Girls in Science, Why It's Important, and How You Can Support Them.* March 2012, NSIS Science Lecture. Museum of Natural History, NS.

Panel Participation

- *Coast to Coast Update of the NSERC Chairs for Women in Science and Engineering*. May 2016. CCWESTT (Canadian Coalition for Women in Engineering Science Trades and Technology) Conference, ON.
- *Women, Gender, and Social Justice*. September 2015. Cross-Campus Conversations, MSVU, NS
- *Inspiring and Engaging Girls in Junior High to Consider a Science-related or Skilled Trades Career. Youth Initiatives Panel*. May 2014. CCWESTT (Canadian Coalition for Women in Engineering Science Trades and Technology) Conference, SK.
- *Leadership Starts Early: The Impact of Role Models*. November 2013. 3rd North American Gender Summit. Washington, D.C.
- *Strategies to Enable Girls to Interact with Role Models and to Expand their Understanding of STEM Careers*. November 2013. 3rd North American Gender Summit. Washington, D.C.
- *Open Your Doors to Your Future Career*. March 2012. WISEAtlantic Role Model Panel Discussion, Girls Conference 2012. MSVU, NS.

Selected Board Participation

- CCWESTT - Canadian Coalition of Women in Engineering Science Technology and Trades- Board Member
- Science Atlantic – Member at Large
- Youth Science Fair – Ethics Committee
- Pan-American Association of Evolutionary and Developmental Biology - Diversity Officer

Reports Released

WISEAtlantic Newsletters: 17 Issues

ACT Conference Report (July 2015 and June 2017)

Step-Up to Professorship Workshop Report (October 2014 and April 2017)

Research Survey – Executive Reports

Career Choices and Influencers in STEM: An Analysis of the Maritime Provinces, January 2014.

Youth Perspectives on STEM Education, Career Choices, and Influencers in Atlantic Canada, November 2016.

All reports are available to view on our website, at: www.WISEAtlantic.ca/resources





WISEatlantic Programs and Events

Girls Get WISE Science Summer Camp



The week-long Girls Get WISE Science Summer Camp is the first of its kind in Canada, and was developed by Dr. Franz-Odendaal. The camp has run annually for five years, with a capacity of 24 girls ages 12-14 years old, and is full within weeks of opening registration. The camp aims to introduce girls to the exciting side of science by engaging them in hands-on activities in science, technology and engineering, and exposing them to a wide range of biology, physics, math and chemistry topics that they have often not experienced yet at school. During one afternoon, girls spend time meeting and interacting with women from a wide range of science, technology, engineering and math (STEM) professions. The intent of the week is to showcase science, as well as science careers in as many ways as possible so that the girls can make informed decisions about their subject choices in later school years.



2014 Camp

"It's important for our daughter to see role models in STEM fields. It is also very important that she have the opportunity to explore areas of STEM where women are underrepresented."

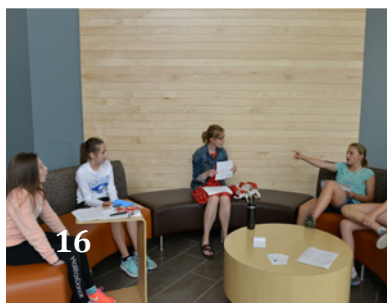
-Parent of Summer Camp Participant

Example of Activities during the camp:

- Extracting DNA from fruit
- Water filtration challenge
- Making borax crystals
- Inventing android phone apps
- Developmental biology
- Paleontology
- Engineering design challenges
- Coding activities
- Entrepreneurship workshops
- Demonstrations in neurobiology



2015 Camp



A unique aspect of the annual camp is that the girls learn about developmental biology using a popular biomedical model organism, the zebrafish. Zebrafish are used by scientists around the world to understand various aspects of biology and human disease. The students learn about zebrafish, breeding, collecting eggs, and then watch their development over five days. In their lab book, the girls are taught to record their observations. Zebrafish allow participants to understand the potential, and real-life applications of scientific discovery.



Exploring Development

“From the pursuit of cancer treatments to studies on muscular dystrophy and many points in between, zebrafish are used by scientists, including myself, to understand various aspects of biology as well as human disease; participants in the camp learn why they are so popular.” -Dr. Franz-Odendaal.



A highlight for many of the girls comes at the end of the week, when parents and the Mount community are invited to an Open House where the girls present their new-found knowledge, and show off their hard work. The students and families always enjoy the afternoon where many of the girls' projects, innovative creations, and scientific discoveries are on display. This opportunity allows the girls to be engaged in presenting their findings, and begin to share what they have learned during the camp. The hope is for the girls to be able to leave the camp more confident, and aware of their abilities and potential.

Parents report that these camps have a long-term impact, and that their daughters have shared the camp experience with on average, 12 other people.



Girls Get WISE Science Retreats



Five Girls Get WISE Science Retreats have been held at Mount Saint Vincent University. These events have given girls from grade seven to twelve the opportunity to experience hands-on activities in science, technology and engineering, as well as meet women in SETT during the popular role model session. The annual retreat has brought young women from various schools across Nova Scotia together to experience interactive STEM workshops. The day-long retreat presents science and technology in a fun, interactive way, and encourages students to consider the options that are available within the STEM fields.



One of WISEatlantic's partners, Eastlink has attended past events and provided media coverage of the retreat and the WISEatlantic programming for their channel, and program *Eastlink Magazine*.



The role model session connects girls with women working in SETT professions, which allows them to learn more about the possibilities of future careers, while chatting with role models in a relaxed setting.

Inspiring Role Models have been women who are a...

- Developmental Biologist
- Former NASA Astronaut
- Geophysicist
- Forensic Anthropologist
- Environmental Engineering Technician
- Defence Scientist
- Aquatic Science Technician
- Electrical Engineer
- Power Engineer
- Computer Scientist
- Health Consultant
- Meteorologist
- Chemist
- Physicist
- Marine Biologist
- Mechanical Engineer
- Nutritionist
- Industrial Engineer



Meeting Role Models

**“Had a lot of fun and really enjoyed experiencing STEM careers.
Definitely coming back!”**

-Retreat Participant



Activities during the retreat have included:

- Coding with Scratch
- Exploring Ecosystems
- Elephant Toothpaste
- Robotics sessions
- DNA Extraction
- Designing Marble roller coasters
- Egg Drop Design Challenge
- Water Filtration Design Challenge

Girls Get WISE Retreats With Our Community Partners



Building off the success of the Girls Get WISE retreats at Mount Saint Vincent University, WISEatlantic has partnered with other universities and organizations to engage girls throughout the Maritimes. Students have enjoyed exciting activities such as: dissecting a lobster, learning about tidal energy, biomechanical testing, or 3-D printing.

WISEatlantic has created a “how-to” guide on organizing and running the Girls Get WISE Science Retreat, and have passed this guide on to other organizations. The University of Prince Edward Island, Cape Breton University, as well as Acadia University are all on their way to independently running all-girls science days on their campuses.

“The Role Model session was really great because you get to explore various careers and see how it worked for those people and how their hard work paid off. It was awesome - learned and experienced a lot.”
-Retreat Participant



Partnerships:

- Halifax Regional School Board- African Nova Scotian Girls
- Engineers PEI
- University of Prince Edward Island
- Dalhousie Agricultural Campus
- Acadia University
- Cape Breton University



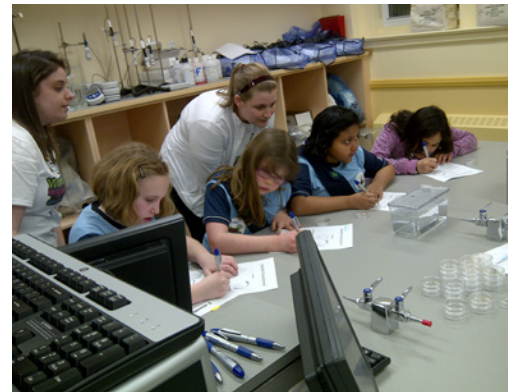
Girl Guides Nova Scotia



In partnership with Girl Guides Nova Scotia, WISEatlantic has run six successful Science Retreats. The retreats have been held at Cape Breton University, as well as Mount Saint Vincent University. The events aimed to raise awareness about the possibilities of STEM careers, and to engage them in hands-on science, technology, and engineering. Participants have enjoyed activities such as a windmill design challenge, extracting DNA from fruit, and racing balloon rockets. The retreats also included role model sessions, in which participants were able to connect with female professionals engaged in STEM careers.

“This was well done and balanced. There were a good variety of presenters to interest girls. The hands-on approach is very motivating for the girls. I especially liked the teamwork aspect of the physics experiment.”

- Girl Guides Leader



“You all rock! Keep up the awesome and inspirational camps!”

-Retreat Participant



Women in Science Retreat, Cape Breton

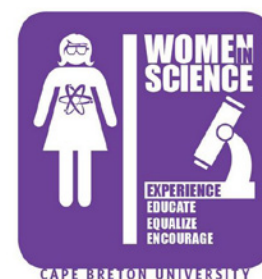


The annual Women in Science Retreat at Cape Breton University has brought together junior and high school aged girls, and first year university students to attend a day-long retreat. The event showcases the opportunities available in science-related studies through activities and keynote speakers. Sponsors and local science related businesses have booths at the event and showcase what they have to offer to the around 150 participants. WISEAtlantic has sponsored the event each year, and have had a booth at the event.

Keynote speakers such as Dr. Tamara Franz-Oodendaal, and the Honourable Kirsty Duncan, federal Minister of Science have inspired the girls, and raised their awareness of STEM opportunities in Canada. Team-building exercises, and hands-on science and technology workshops allow the attendees to engage in fun, and educational STEM activities.

Thank you to Dr. Stephanie MacQuarrie who has been instrumental in establishing this event at CBU.

Cape
Breton
University
Happen.



Women in Action Video Series



The Women in Action Series is a collection of videos which explore diverse careers for women in science, trades, technology, and engineering related fields. In partnership with Techsploration, the videos were filmed and produced by Firefly Digital Media Inc. Each video interviews a female role model who is currently working in a STEM profession, and details in their own words their experiences in this career. Women speak to the opportunities and paths that led them to their current job, and how they use science and math everyday. Each video ends with the role model sharing their advice with the viewers when considering future careers, and high school courses. The videos have featured

a wide variety of unique career opportunities, and have been a useful tool for educators, parents, and students. The videos also showcase the varied pathways to these careers. Transcripts of the videos are available on the WISEatlantic website, together with lesson plans for teachers in junior high.

Videos Sponsored by WISEatlantic have Featured:

- Alicia Oickle, Green Mining Chemist
- Danielle Cox, Mathematician
- Jesse Benjamin, Veterinarian
- Katja Fennel, Oceanographer (co-sponsored by ACENET)
- Karen Smyth, Information Technology
- Kirsten Tomilson, Technology Entrepreneur
- Maxine Westhead, Marine Biologist
- Megan Dufton, Embryologist
- Melissa Grey, Paleontologist
- Monique Guilderson, Medical Illustrator
- Shalyn Williams, Electrical Systems Engineer
- Sophia Stone, Plant Biologist
- Tamara Franz-Odendaal, Developmental Biologist



In total, the role model videos have been viewed over 8,000 times!

The *Breaking Stereotypes in STEM* lesson plans were created by WISEatlantic, and integrate the videos into a classroom setting. The lessons are meant to make students aware of the gender stereotypes that exist in STEM careers, and aim to teach students that many careers require a background in science and math. The videos allow students to be exposed to many different types of STEM careers, and become more aware of their limitless possibilities, regardless of their gender. Showcasing women in these fields inspires girls, and is important for all students to see.

Girls and Technology

Girls in Tech League

A Girls Tech League was piloted in 2013 as an opportunity for girls in grades 7 to 9 to explore the world of digital technology. By using visual programming to create an app, build a business plan and envision their bright ideas, the girls learned valuable skills while having fun and working in a team environment. The league was supported by WISEatlantic, CompCamp, Students in Business and the Mount.

Four teams of girls from Highland Park Junior High School, Fairview Junior High School and two from Bicentennial Junior High, explored computer programming in after-school sessions with mentors for eight weeks. Each team of students created an app prototype using the visual programming tool MIT AppInventor, and produced a business plan as well as a short video. The students presented their projects to a panel of three judges, comprising prominent local business and technology community members. The event included an awards reception where the winners were announced, and parents witnessed the incredible work of the teams.



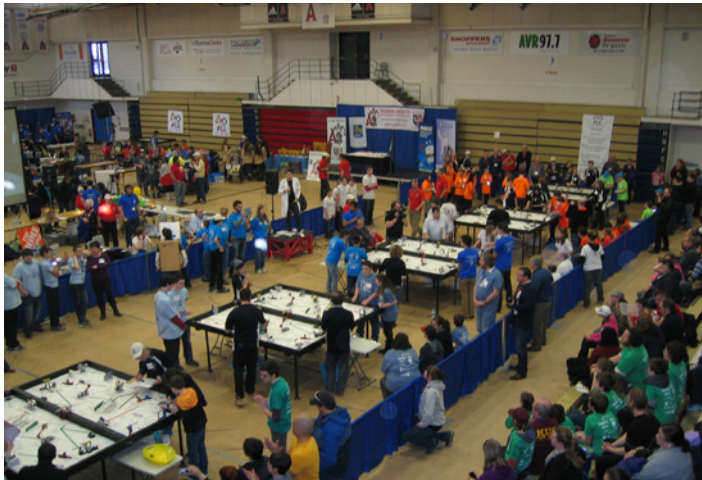
Girls Learn Code: Webmaking with HTML & CSS



In the Fall of 2016, WISEatlantic teamed up with Ladies Learning Code to present a series of workshop for girls in junior high on coding, and webmaking. Over the course of three workshops, participants learned all about design, user experience, and used their imagination and creativity to build a one-page website. Centered around a social cause, business idea or personal portfolio, girls learned the building blocks of the web: HTML & CSS and built their own website from scratch.



FIRST LEGO League Robotics Team Sponsorships



FIRST LEGO League (FLL) is an international robotics program and competition that is designed to gain students' interest in math, science and technology. WISEatlantic has sponsored eleven FIRST LEGO League robotics teams in Nova Scotia since 2012, where at least 50% of the team members were female.



Using LEGO MINDSTORM technology, teams of students worked alongside adult mentors to design, build and program robots to complete missions based on real-world challenges. Past challenges have included tackling issues such as responding to natural disasters, solving challenges seniors face, or waste management. Mount Saint Vincent University faculty and staff coached the “Mount Mystics” in 2013, and “Mount Wildstyle” in 2014. The “BotBesties” team in 2015 was coached by the mothers of two of the team members, Victoria and Julia. Dr. Franz-Odendaal was a coach for all three teams. Many of the teams sponsored by WISEatlantic have advanced to provincials, and received awards such as the Core Values Trophy and Best Decorated Pit Area. WISEatlantic also provided funding for two teams to attend the international FLL competition in the US in 2015, and again in 2017.



Teams Sponsored by WISEatlantic:

- Sisters of Science
- Shambhala Shadowvolts
- BotBesties
- Mount Mystics
- Mount Wildstyle
- Charles P. Allen “Cheetahs”
- Pictou Landing First Nations Elementary
- Sir John Alexander High School
- Kings-Edgehill School

Classroom Engagement

Classroom Visits

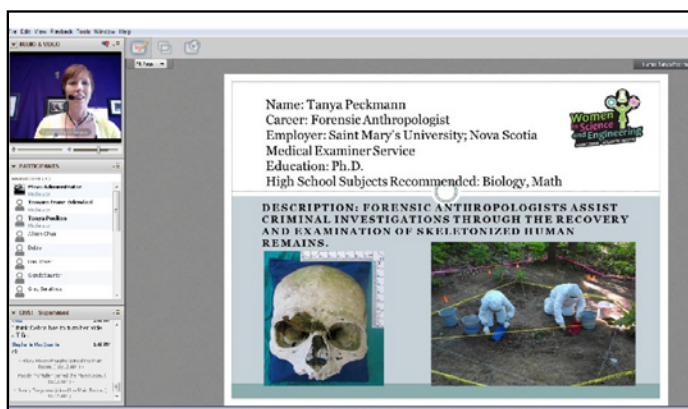
WISEatlantic has visited 13 classrooms across Nova Scotia to engage with students at varying grade levels. The visits raise the students' awareness about the gender imbalance in many of the STEM fields, the need for STEM professionals, as well as more about WISEatlantic. The students were able to discuss career goals, and the presentations highlighted the importance of being enrolled in math and science courses to keep students' options open. School visits have also included hands-on experiments and science demonstrations to pique students' interests in the sciences. The visits showcase unique STEM careers through the role model videos developed by WISEatlantic, and give students the opportunity to ask questions about different career paths.



In 2016, WISEatlantic sponsored an Acadia University Physics student to visit nine high schools across Nova Scotia. During her visits, the student led a 45 minute presentation on subatomic physics, informing students of the research possibilities available to them, and followed her presentation by a question period. Over 350 students were exposed to these presentations.

Webinars

In order to engage with classrooms in a broader radius, WISEatlantic developed webinar presentations which allow various individuals to link-in to the same session, and chat with each other. In this way, WISEatlantic was able to reach classrooms, and teachers throughout Atlantic Canada.



WISEatlantic has connected women in STEM with junior and high school classrooms during role model webinars that featured 3-4 female role models in varying STEM careers. During the sessions, each role model spoke about their careers, their favorite part of their job, as well as which high school courses they recommend taking. Following their presentations, students were invited to ask the role models questions during an open Q & A session.

WISEatlantic has held role model webinars for seven schools in the following topics:

- *20 Careers in 60 Minutes*
- *Career Decision Making*

Engaging Teachers

Teachers play a critical role in breaking the stereotypes that often prevent girls from entering the STEM fields, and WISEatlantic offers resources and opportunities for teachers to promote women in STEM in their classrooms. WISEatlantic connected with a large portion of science teachers in Nova Scotia during the annual Association of Science Teachers (AST) Conference. The conference is attended by teachers from varying grade levels and brings together over 800 participants, plus presenters and exhibitors. WISEatlantic has held a booth at the conference each year since 2012, and has led workshops during the conference. Online, WISEatlantic also offers a broad range of resources for teachers, such as webinars, lesson plans, promotion for local events, and links to free STEM material.

Workshops delivered to teachers:

- *Engaging Girls in the Technology Classroom*. August 2016. Teach Today for Tomorrow Conference. MSVU, NS
- *How to Encourage Girls in STEM and Why It's Important*. 2015 AST Conference and 2015 Guidance Counselor Symposium, NS
- *Demonstrating a role model webinar*. 2013 Guidance Counselor Symposium. MSVU, NS.
- *Promoting Hands-on Science Engagement in Atlantic Canada*. 2012 AST Conference, NS.

Let's Talk Biochemistry WISEly Symposium

Teachers were encouraged to bring their science classes to the Let's Talk Biochemistry WISEly Symposium at Mount Saint Vincent University hosted by WISEatlantic and Let's Talk Science in the Fall of 2016. During the day-long symposium, 78 junior high students were introduced to the topic of biochemistry and had the chance to explore careers available in this field. There were three presentations from biochemistry experts as well as hands-on activities that demonstrated the more practical side of this field of study.



MSVU Girls Conference

For the past six years, Mount Saint Vincent University and the Alexa McDonough Institute for Women, Gender, and Social Justice (AMI) have hosted the annual Girls Conference which brings together girls from local schools, as well as delegates from local colleges, universities, and community organizations. During the conference, girls have the opportunity to participate in various workshops and activity sessions hosted by community organizations. WISEatlantic has participated in the conference since 2012, hosting information sessions and workshops for attendees. Sessions have included role model panels, coding workshops, and presentations on STEM career opportunities. The 2017 session was sponsored by JD Irving Ltd.



Explore STEM Careers Seminar, 2017

Community Engagement

“Intersection between Talent and Passion”

Date: February 24, 2016, NS

WISEatlantic held a public lecture at Mount Saint Vincent University with Dr. K. Renee Horton entitled “Intersection between Talent and Passion” in February of 2016. The event was co-sponsored by Imhotep Legacy Academy. Dr. Horton currently works for NASA Michoud Assembly Facility (MAF) in New Orleans, LA. During the lecture, Dr. Horton shared her story of how hard work and a passion for math & physics led her to a career as lead Space Launch System (SLS) Core Stage Metallic and Weld engineer with NASA. Dr. Horton was the first African American to receive her degree in Material Science from the University of Alabama. Her enthusiasm and zest for life were evident during the lecture, and attendees left the lecture feeling inspired.



IMHOTEP'S
LEGACY ACADEMY

“Science Communications and Stereotypes”

Date: March 6, 2014, NS



Held at Saint Mary's University, WISEatlantic organized: “Science Communications and Stereotypes,” a public forum which included keynote speakers Kathryn O'Hara (Ottawa, ON), and Mary Anne Moser (Calgary, AB) as well as panelists: Physicist Roby Austin, Chemist Stephanie MacQuarrie, Science Educator Ruth Munro, and Engineer Laura Whynacht. The event was facilitated by See Meaning Graphic Facilitation and Recording. The forum aimed to discuss whether, and how gender affects the way science is communicated or the way that it is received by the public. The speakers addressed the most current research regarding the status of gender in STEM professions, and the panel discussion focussed on issues of gender in science communication and the STEM workplace, and plans for the future. The event was well attended, and allowed scientists and professional science communicators to discuss, and collaborate on the topic of gender and science communication.

The event was co-supported by: Encana, Hypatia Association, Digital NS, The Discovery Centre, and the NS Council on the Status of Women in Canada.

Webinars for Parents

To connect with parents through Atlantic Canada, WISEatlantic developed and delivered free webinars to discuss engaging girls in STEM, and how parents can see them through barriers that girls face to STEM fields.

Webinars have included:

- *Practical Advice for Parents: Guiding your daughter in subject and career decisions.* November 2015.
- *10 Common Myths about Girls and STEM and How to Bust Them.* October 2015

Big Dream

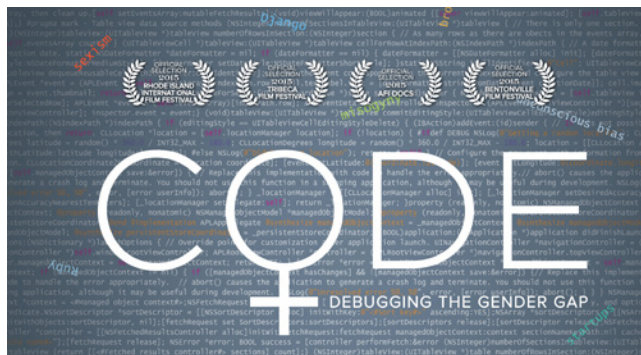
Date: March 28, 2015, NS

WISEatlantic, the Atlantic Association for Research in the Mathematical Sciences (AARMS) and Dalhousie Computer Science co-hosted the first approved Canadian screening of the film “Big Dream” which centred on empowering women to pursue a future in STEM. The film follows the stories of seven young women who are breaking barriers and overcoming personal challenges to follow their passion in science, math, computing & engineering. *Big Dream* immersed viewers in a world designed by and for the inspiring next generation of girls. The event was well-attended, with over 80 people in the audience.



CODE: Debugging the Gender Gap

Date: May 12, 2016; October 27, 2016, NS



WISEatlantic hosted two free public viewings of the award-winning documentary “CODE: Debugging the Gender Gap” at Mount Saint Vincent University. The CODE documentary exposed the dearth of American female and minority software engineers and explores the reasons for this gender gap and digital divide. The film highlights breakthrough efforts that are producing more diverse programmers and shows how a critical gender gap can be closed. The screening in May was a satellite activity of the NSERC Science Odyssey Week in 2016.



Public Library Sessions

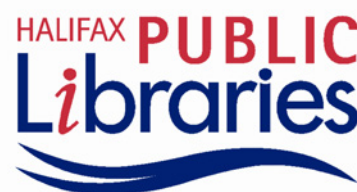
In partnership with Halifax Public Libraries, WISEatlantic has hosted role model panels and information sessions at local libraries including: Keshen Goodman, Woodlawn, and Spring Garden Public Library. In 2012, WISEatlantic hosted four role model panels featuring female STEM professionals such as: engineers, an X-ray technician, biologists, a mathematician, and women in the IT field. The role model sessions allowed female students to learn about the unique and diverse careers that exist within the STEM field, and to connect with women working in the field. The role model panels were well attended, and appealed to both high school and junior high students in the community.



In 2016, WISEatlantic presented *10 Common Myths Girls Have About STEM & How to Bust Them* at the Halifax Central Library, as well as at the Keshen Goodman Public Library. The presentation was open to parents, teachers, and girls in grades seven to twelve, and addressed the common myths girls have about STEM, with tips on how to “bust” them. The presentation also included strategies that could be used to guide girls through STEM subject and career decisions. Parents were encouraged to support their daughters by exposing them to STEM role models, and career opportunities that would suit their talents and passions. Videos of the presentations are available online.

10 “Busted” Myths Girls Hold About STEM...

1. Physics is ~~not~~ for girls
2. Girls and tech careers do ~~not~~ mix
3. People ~~have a knack for~~ *can learn* science and math
4. Boys are *not* better at math
5. Girls will ~~never~~ reach the top positions in STEM
6. If you are creative, science is ~~not~~ for you
7. If girls want to help people, STEM jobs ~~don't~~ provide this opportunity
8. It's ~~more~~ important to do subjects you're good at ~~than~~ *and* subjects you enjoy
9. Jobs in technology are *not* dull *and involve teamwork*
10. ~~Some~~ *No* jobs are out of bounds if you want to have children



Science Atlantic Partnerships

Explore Science Research Event

Date: March 15, 2014, NS

Science
Atlantic  Atlantique



During Science Atlantic's Aquaculture & Fisheries and Biology Conference held from March 14 to 16, 2014, WISEatlantic hosted an Explore Science Research event for students in grades 9-12. The conference, held at Mount Saint Vincent University, brought together undergraduate university students from across Atlantic Canada to present their research. High school students attended the Explore Science Research event on March 15, which allowed them to view the poster presentations by the university students. During an hour session, the attendees viewed the posters, and were able to learn about the research that university students conducted. Dr. Franz-Odendaal was a keynote speaker at the conference. The event opened the students' eyes to the possibilities of pursuing science at the university level, and the participants all reported that the event motivated them to consider a career in science.

Women in Science Speaker Tour

The Women in Science Speaker Tour, sponsored by WISEAtlantic and Science Atlantic showcases the research conducted by female faculty in Atlantic Canada. The tour was launched in 2016, with the speakers visiting three Science Atlantic member institutions.

Dr. Catherine Lovekin, an Assistant Professor in the Department of Physics at Mount Allison University was the first speaker and gave a public talk at Acadia University, as well as research seminars at University of New Brunswick, and Mount Saint Vincent University. During the tour, Dr. Lovekin presented her research, discussing the techniques of asteroseismology and what has been discovered about stars as a result.

Dr. Karen Crosby, an Assistant Professor in the Department of Biology at Mount Allison University gave a public talk at Acadia University on the connections between the brain, ones appetite and obesity. She also gave research presentations at the University of Prince Edward Island, and Mount Saint Vincent University.



Breaking Stereotypes Through the Media

Networking and Twitter Information Session

Date: November 12, 2015, NS

WISEatlantic hosted a Networking and Twitter Information Session on November 12, 2015 at Mount Saint Vincent University. The event was open to women interested in starting to use the social media platform Twitter, or for those who wanted to use their present account more effectively. Thirty women studying or working in various STEM fields came together at the Mount to network and to learn the basics of Twitter.

Dr. Tamara Franz-Odendaal opened the event by discussing how Twitter can be useful to women in STEM to get their voices heard about their research, and to address STEM stereotypes and gender inequality. Lorraine Mockford, an Instructional Designer with the NSCC, led the session and shared tips on: how to use Twitter, expanding a professional network, Twitter language and techniques as well as Twitter tools. The event encouraged the participants to use Twitter to their advantage, and as an opportunity to address gender inequality, and STEM stereotypes.



Op Ed Workshop with Shari Graydon

Date: June 5 2015, NB; May 2 2017, NS.

Participants joined award-winning author, educator and advocate, Shari Graydon of Informed Opinions for an Op Ed writing workshop. The workshop was highly interactive, and presented tips to build women's leadership capacity and enhance their credibility and influence. Shari Graydon provided participants with tools to contribute their expertise to the public discourse through compelling, short-form written commentary for newspaper opinion pages and online sites. Both workshops were sponsored by NSERC.

The session equipped women to:

- Own and articulate their authority as experts;
- Understand the essential elements and format of newspaper commentaries;
- Increase their publication prospects;
- Correspond and work with editors and journalists in general.

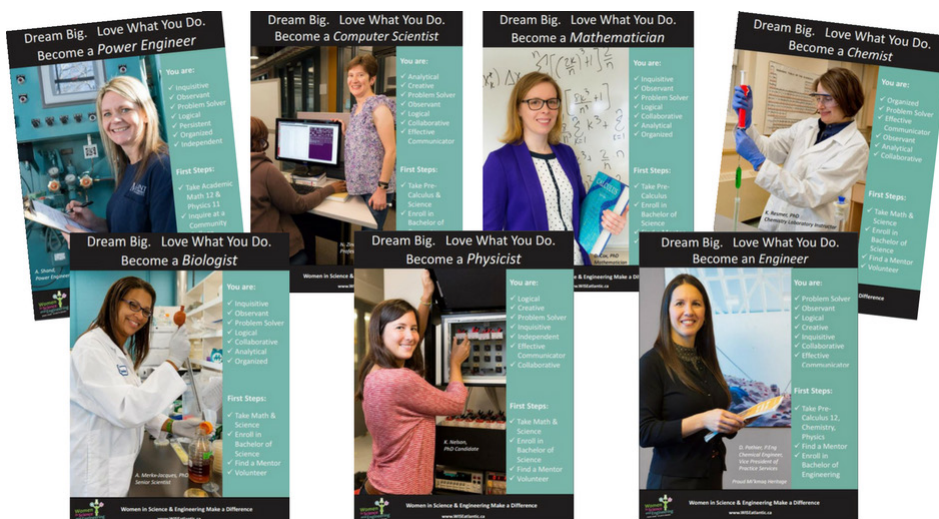
As a result of the first workshop, Dr. Franz-Odendaal published an Op Ed in *The Chronicle Herald* entitled "Want to help women in science? Provide decent childcare for starters." Several other attendees have also successfully published Op Eds.

Diversity Poster Series

In 2016 and 2017, WISEatlantic created a poster series to encourage students to “dream big” and consider science, engineering, technology and trades (SETT) based careers. Each of the seven posters featured a photograph of a local woman working in SETT, described common traits for each career, and the first steps to considering these career paths. The posters were offered free of charge to teachers and guidance counsellors, and are displayed on university campuses.

Careers featured on the posters:

- Biologist
- Power Engineer
- Computer Scientist
- Chemist
- Physicist
- Engineer
- Mathematician



The posters are available to download on our website at www.WISEatlantic.ca/teach

Regional Nodes

Since 2011, WISEatlantic has organized quarterly ‘Regional Nodes’ teleconferences with members of various Atlantic Canadian organizations that support women in SETT and/or encourage girls to pursue STEM careers. The purpose of the Regional Nodes teleconferences are to keep up-to-date on the various activities conducted by organizations with shared goals, and to learn how we can better support each other. The teleconferences allow like-minded organizations to connect, share resources, and encourage one another. It also allows organizations to know when events are happening which relate to women and girls in STEM.

Organizations who have taken part in teleconferences include:

- Information Technology Association of Canada, NS
- Association of Professional Engineers and Geoscientists of NB
- WISE NL
- Digital Nova Scotia
- Dalhousie University- Computer Science
- University of Prince Edward Island- Engineering
- Cape Breton University- Women in Science
- Government of PEI
- Engineers NS
- Hypatia Association
- Women in Engineering - Nova Scotia
- WinSETT Centre
- WISE Acadia
- New Brunswick Women in ICT
- CanWITT, Nova Scotia Chapter

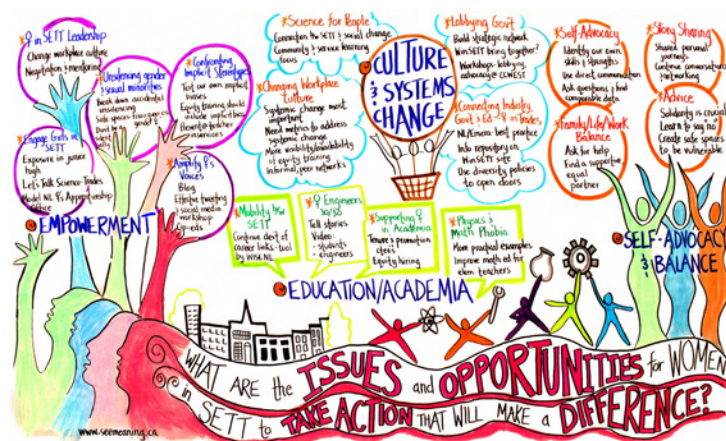
Atlantic ConnecTions Conference

Date: June 4 & 5, 2015, NB; May 3 & 4, 2017, NS



WISEatlantic organized and hosted the first Atlantic ConnecTions Conference at Mount Allison University in June 2015. The conference brought together sixty eight women and eleven speakers in SETT from a cross-section of industry, education, government, and not-for-profit organizations from the Atlantic region. The aim was to provide an opportunity for women in STEM from Atlantic Canada to share their experiences of studying and working in male-dominated fields, to network with others, and to develop action items with the goal of advancing women in STEM. The theme of the conference was “ACT”: **Act, Celebrate, Collaborate, Transform**. The conference was facilitated by Donna Clark of Courage Group International and graphically recorded by See Meaning Graphic Facilitation and Recording.

The format of the conference was Open Space Technology which allowed participants to set the agenda and participate in discussions that were meaningful to them. Open Space Technology (OST) is the name given to a meeting without a predetermined agenda. This meeting methodology is used as an effective process for facilitating learning and change in both organizational and community settings. OST is best used when there is an important issue to be addressed, a diversity of people involved, complexity, high passion, including conflict, or when decisions need to be made quickly. Open Space Technology meetings enable the building of energy and participation in ways that few other processes do.



Open Space conversations included topics such as:

- Finding family-work-life balance
- Ways to engage girls in SETT
- Marrying SETT and social justice
- Increase enrollment of women in engineering
- Changing workplace culture
- Learning to self-advocate
- Supporting women in academia
- Un-silencing of gender and sexual minorities



Once the agenda was complete, the marketplace was opened. Participants selected the sessions that they wished to attend. Discussion leaders were responsible to ensure that the key points were recorded on a summary sheet, and data was entered into a bank of laptop computers. A total of 17 reports were generated. Participants joined together for morning news on day two before continuing to gather for the morning conversations. After lunch there was a time for identifying actions that were emerging for further work following the conference.

Highlights from the 2015 Closing Circle

"I am leaving here feeling inspired. When I go to work Monday I am going to stand up for myself."

"I want to bring some of your stories home to my daughter and step-daughter."

"Really enjoyed it and as a student about to transition to the workforce. I found this very beneficial to get advice."

The second ACT Conference was held in Halifax in May 2017.

The 2017 ACT Conference brought together over 100 women in SETT from Atlantic Canada to share their experiences, network, and develop action items with the goal of advancing women in SETT. The event featured keynote speakers Vandana Juneja, (Senior Director at Catalyst) and Gloria Montano, (Director of WinSETT). Donna Clark of Courage Group International also facilitated the open sessions at this conference. During certain parts of the conference, participants were offered parallel streams for women in technology, trades, academia, or engineering. The attendees were engaged, and enjoyed connecting with women in a variety of professions.

Words participants used to describe the conference included:



WinSETT Workshops



WISEatlantic has cosponsored thirteen individual workshops, and two full series (of five workshops) presented by the Canadian Centre for Women in Science, Engineering, Trades and Technology (WinSETT Centre) since 2012. These workshops provide professional training to women in the SETT fields in topics such as communication, negotiation, leadership, and networking. The events have taken place in Nova Scotia and Newfoundland and Labrador, and have reached over 380 women.

The workshops are tailored to early and mid-career female engineers, scientists, technologists, and trades women. The workshops are highly interactive and focus on increasing women's skills through guided role-play exercises, and case studies in a supportive environment. Participants were presented with strategies and tips shared by female leaders in the sector who were the guest luncheon speakers. This full suite of workshops was offered as a series for the first time in Nova Scotia between October 2015 and March 2016, and in Newfoundland and Labrador from January 2017 to May 2017. Dr. Franz-Odendaal has been a guest speaker at some of the workshops, and was a participant at others. Some workshops were co-sponsored by: Digital NS, Emera NL, Engineers Canada, and Dalhousie University.

WinSETT Workshops cosponsored by WISEatlantic:

- Microaggressions in the SETT Workplace (May 2017; *Special Topic*)
- Networking and Professional Presence (May 2017; *Special Topic*)
- Full Leadership Series, St. John's, NFLD (January - May 2017)
- Difficult Conversations, Halifax, NS (November 2016; *Special Topic*)
- Full Leadership Series, Halifax, NS (January - March 2016)
- Effective Communication, Truro, NS (February 2016)
- Negotiating for Success, Halifax, NS (April 2015)
- Effective Communications, Halifax, NS (May 2014)
- Negotiating for Success, Halifax, NS (October 2013)
- Becoming Leaders, Halifax, NS (May 2012)

Step-Up: Academic Advancement Workshops

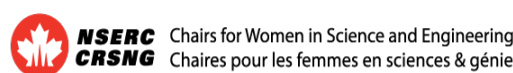
Dates: October 3, 2014, NS; March 17, 2017, NB

In order to support the career advancement of female faculty members in Science, Computer Science, and Engineering, WISEatlantic organized and hosted Step-Up to Professorship Workshops in Halifax in 2014, and in St. John in 2017. The day-long event included the sharing of insights by women who are already Full Professors and those who have served as Deans and Department chairs. The speakers and panelist invited the women to engage in frank discussions about the process and experience of applying for promotion, and shared their advice and participated in conversations. Additionally, networking opportunities were created during the day and the women were encouraged to develop plans for their career advancement.



Several discussions took place that focussed on the following topics:

- Managing sabbaticals
- How to handle disappointment if your promotion is not successful
- External reference letters
- Cover letters to your package
- The sharing of personal experiences.
- Negotiation strategies



Chairs for Women in Science and Engineering
Chaires pour les femmes en sciences & génie

Réseau National Network



Opportunities to share challenges in achieving criteria in service, research, and administration were created, as well as space for the sharing of strategies. One session provided strategies for negotiation, work-life effectiveness, and sustaining health and energy. A Step-Up Plan was also shared with the women as a tool to be used in their career planning. The workshops ended with an opportunity to provide written feedback on the day and a closing circle for sharing reflections about their experiences.

As a result of these workshops, several attendees have applied for, and been successful in their academic promotions.

In addition, Dr. Franz-Odendaal facilitated an academic advancement workshop for faculty at St. Francis Xavier University on April 7, 2017 thanks to the support from the Dean of Science and Dean of Arts.

University Student Engagement

Through workshops, presentations, and sponsorships, WISEatlantic has been able to support women in STEM at the post-secondary level.

Dr. Franz-Odendaal has spoken with students, and has facilitated sessions for female STEM students and faculty. She has presented at the Mount, UPEI, Dalhousie University (Halifax and Truro campuses), Mount Allison University, Acadia University, and Memorial University. WISEatlantic has also provided sponsorship and logistical support to run professional development workshops for senior graduate students and faculty at Dalhousie University in 2015 and 2016.



WISEatlantic supported students and faculty to attend conferences such as the Gender Summit-3 in 2013 in Washington DC, the National Conference on Women in Engineering in Vancouver in 2013, as well as the Canadian Coalition of Women in Engineering, Science, Trades and Technology (CCWESTT) Conference in 2014. In January 2016, WISEatlantic was a sponsor for the Canadian Conference for Undergraduate Women in Physics which was held in Nova Scotia.

WISEatlantic has been able to directly engage with over 650 university students in the Atlantic region through these initiatives.

Women in Engineering Workshop

Date: May 6, 2014, NS



The Women in Engineering - Nova Scotia group met to continue a conversation which started on November 26, 2013 entitled *The Engineers Call to Lead*. At the initial session, participants identified a significant barrier to women in engineering obtaining leadership roles. WISEatlantic hosted an event for women in engineering at Dalhousie University to focus on sharing what has helped them to achieve successes in their careers and what individual and collective actions they could take to overcome the barriers they had identified. WISEatlantic sponsored the event, as well as NS Women in Engineering, Hypatia Association, and Engineers NS. The conversations were facilitated by Donna Clark of Courage Group and Corrie Melanson of See Meaning Graphic Facilitation and Recording.

The women discussed what would be possible for women in engineering if they were successful at achieving the future that they dream of- a vision which inspired them. Based on the discussions, several key factors and resources were identified as being helpful for success and seeded ideas for future actions.

Together the women identified three areas for collective action:

1. Raise the profile of women in engineering
2. Create Resources – including a lending library and scholarship fund
3. Create training opportunities

Engineers NS has since established a Women in Engineering Committee that is now very active.

Research Study

Dr. Franz-Odendaal led a team of researchers that tracked young decision makers by analyzing the decision-making strategies used by youth when they grapple with their career decisions. The research team conducted surveys to assess how students perceive careers in science and engineering, and how they make their career decisions. The study focused on junior high school students, and aimed to understand how engaged students were in math and science, their future intention for study, as well as the likelihood that they would consider a STEM career down the road. Research also addressed students' knowledge of how relevant science and math were across various types of careers. Gender and grade differences, and influencers on science and math study, were also examined.

Students in Grades 7 and 9 completed an online survey during school hours, supervised by teachers and staff. The sample was collected in two iterations, with the first sample collected in 2012-13 and the second in 2014-15. Data was collected from students in all four Atlantic provinces. The research design allowed comparisons of student cohorts from Grades 7 and 9, while also providing a large sample of junior high school students from across the Atlantic region. Data was weighted by grade and province to control for sample variation across grades and provinces. A total of 1,448 surveys were completed.

The first phase of the study was released in January 2014, and the second phase was released in November 2016. **Results show that the most effective way to encourage students to consider choosing a STEM career is to expose them to STEM role models as well as to involve them in highly engaging STEM activities.**

Research Team Members:

Dr. Tamara Franz-Odendaal, Department of Biology and NSERC Chair Women in Science and Engineering, (Atlantic Region), Mount Saint Vincent University (Lead Investigator)

Dr. Karen Blotnicky, Department of Business and Tourism, Mount Saint Vincent University

Dr. Fred French, Department of Education Mount Saint Vincent University

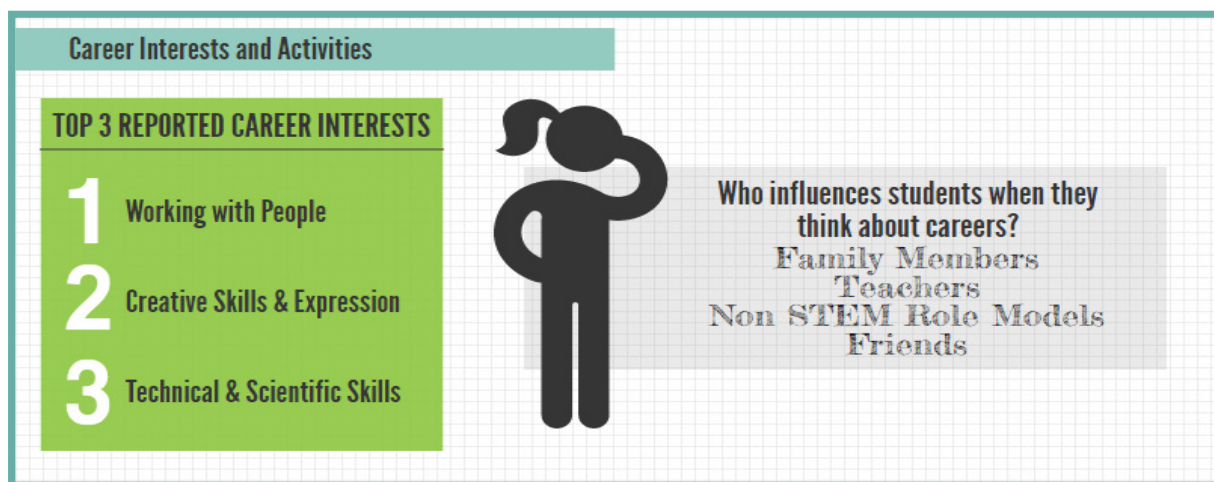
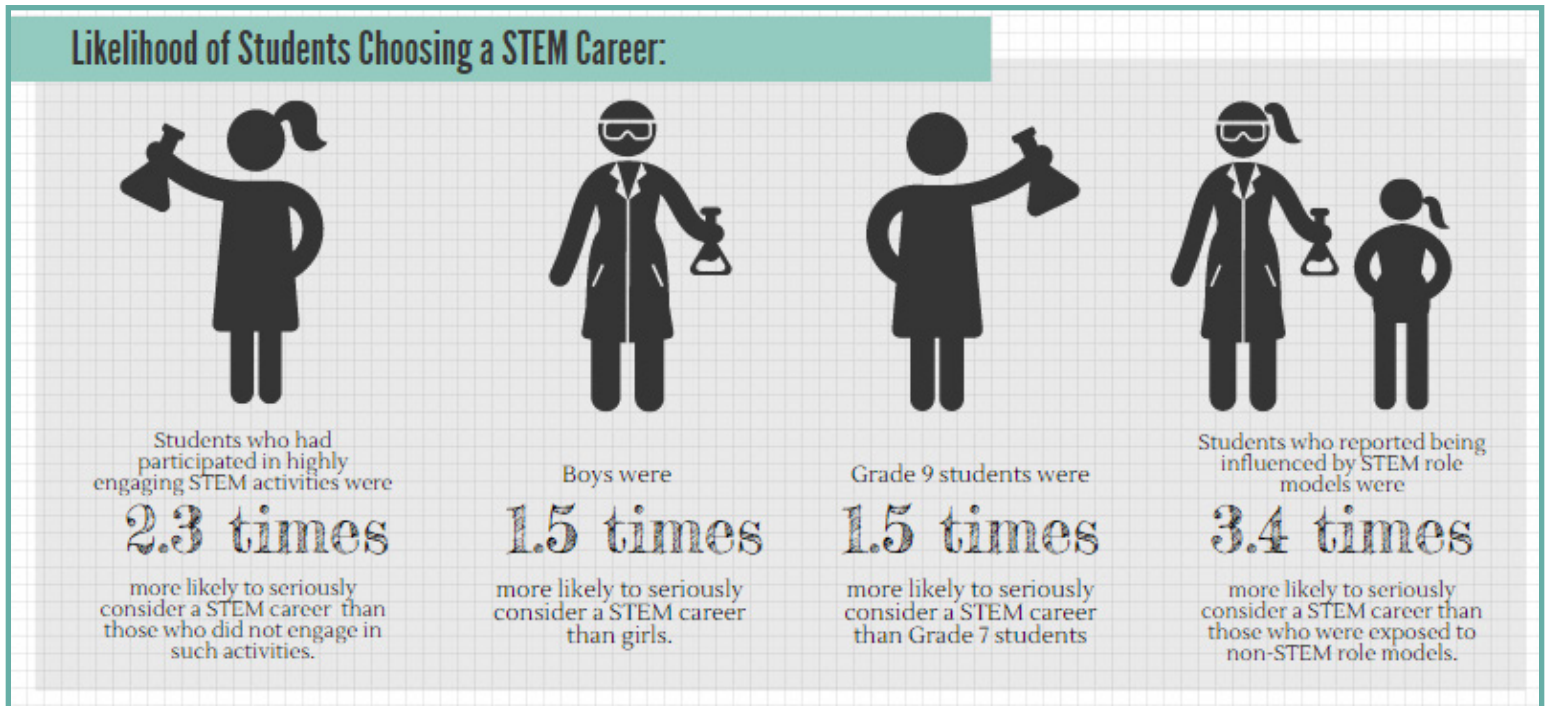
Phillip Joy, Department of Applied Human Nutrition, Mount Saint Vincent University



Dr. French, Dr. Franz-Odendaal, Dr. Blotnicky, Mr. Joy

The Executive Reports are available at: www.WISEatlantic.ca/resources

Key Findings from the 2016 Report



The first peer-reviewed research paper from the study has been published:

Franz-Odendaal, T., Blotnicky, K., French, F., & Joy, P. (2016). Experiences and Perceptions of STEM Subjects, Careers, and Engagement in STEM Activities Among Middle School Students in the Maritime Provinces. *Canadian Journal of Science, Mathematics and Technology Education*, 16(2), 153-168

Special Thanks



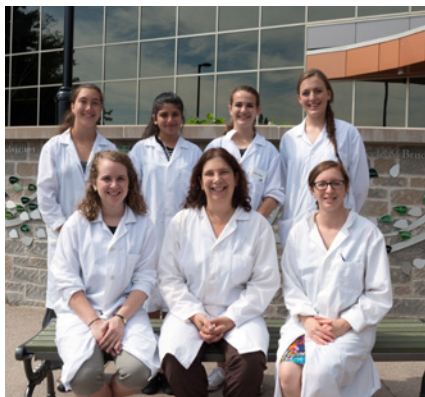
Thank you to **Donna Clark** of Courage Group International for her facilitation of many of our professional development events over the last five years, including all the WinSETT workshops in Nova Scotia, and both Atlantic Connections Conferences. We are grateful for her engaging presence, and her ability to create conversational spaces that inspire learning, and support the advancement of women in SETT.



courage group
international

Thank you to **Nan Armour**, former Executive Director of the Hypatia Association, and former president of CCWESTT. Nan has worked most of her professional life supporting the recruitment, retention and advancement of women in SETT, and we are grateful her ongoing support and encouragement over the last five years.

Thank you to all our role models who volunteered their time at our events. We are so grateful for your support, and inspiration!



2016 Summer Camp Volunteers & Staff

We are thankful for our amazing volunteers! Without their commitment and support many of our events would not have been possible.