

Advancing Inclusion in STEM

Dr. Stephanie MacQuarrie

Cape Breton University

Dr. Svetlana Barkanova

Memorial University of Newfoundland

Dr. Kevin Hewitt

Dalhousie University



NSERC Chairs for Inclusion in Science & Engineering – **Atlantic**

Changing the face of STEM in Atlantic Canada through Equity, Diversity and Inclusion

Evolution of NSERC Chairs for Women in Science and Engineering (CWSE) with a goal of increased inclusion for equity-deserving groups across multiple intersecting dimensions



Dr. Svetlana Barkanova
Memorial University of Newfoundland



Dr. Kevin Hewitt
Dalhousie University



Dr. Stephanie MacQuarrie
Cape Breton University



Japna Sidhu-Brar
NSERC CISE-Atlantic Program Manager



Kathryn White
NSERC CISE-Atlantic Project Coordinator



CISE-Atlantic Initiatives 2024

Recruitment, Retention, Talent Development



1.1 RETREATS



1.2 ACT
CONFERENCE



1.3 PHYSICS IN
RURAL
CLASSROOMS



1.4 CURRICULUM
DEVELOPMENT



1.5 CAMPS



1.6 CATALYZE
AND FACILITATE



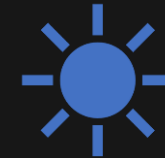
1.7 SCHOLAR
EMPLOYMENT



1.8 L'NU HEALTH
CBU UNAMA'KI
COLLEGE



1.9 INCLUSIVE
SPEAKER ROSTER
DEVELOPMENT



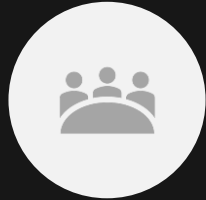
1.10 TOTAL SOLAR
ECLIPSE 2024

CISE-Atlantic Initiatives 2024

Policy & Systemic Changes Through Connection Building



2.1 K-12
EDUCATION
POLICY



2.2 OUTREACH IN
TENURE AND
PROMOTION



2.3 SCIENCE FAIR
STRUCTURE
POLICY



2.4 PROMISING
PRACTICES (PP)
DATABASE

Research & Dissemination



3.1 EVALUATION
IN STEM
OUTREACH



3.2 CAREER
CHOICES IN STEM



NSERC

STRATEGIC PILLARS

1: Support research excellence that strengthens Canada

2: Expand, diversify and nurture Canada's talent pool

3: Translate discovery into impact

4: Mobilize knowledge on a global scale

Guides CISE-Atlantic's Mission of Advancing Inclusion in STEM across K to 18+



2, 3 Catalyze & Facilitate Partnerships

Total Solar Eclipse (ages 5-18+)

2, 3 STEM Education Policy Partnership with Departments of Education (5-18)

3 Science Fair Policy Examination

2, 3 Self-Evaluation Tools in STEM Outreach

3 Study & Report on Career Choices between Physical Sciences and Engineering

2, 3 Curriculum Development (11-18)

CISE- A Camps (11-16)

Physics in the Rural Classroom (12-18)

2 Scholar Employment (14-18)

1, 2 L'nu Health Sci Advantage (15-17)

CISE-A Retreats (12-18)

2 CISE-A Conferences and Science Fairs (12-18)

2, 4 National Roster of Speakers & Role Models (ages 18+)

2, 3, 4 Outreach in Tenure & Promotion Policy (ages 18+)

1, 2, 3, 4 National Promising Practices Database (ages 18+)

Curriculum Development

Educational Content Diversification



Patience attracts
happiness; it brings near
that which is far.

Swahili



Culturally Relevant Pedagogy

Imhotep's Legacy Academy After-School Program

Suite of STEM Lesson Plans

- Representation: Black Scientists and Engineers
- Ways of Thinking and Being: African Proverbs
- Curriculum: Nova Scotia Science and Mathematics



Garrett Morgan (1877-1963) was an African-American inventor who invented the “smoke hood”, which was an early version of a gas mask, a device that is used to protect humans from inhaling harmful gases.

ACTIVITY 8.10 (Exploiting Thermodynamics and Magnetism)

Imhotep's Legacy Academy
66 subscribers

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[Fireproof Paper and a Magnetic Heat Engine](#)

Imhotep's Legacy Academy, Grade 8 Activity Plan

August 2016.



Culturally Relevant Pedagogy

Library of resources for grades 6-12

Featuring women with **intersecting identities**



Top (L-R): Kumudu Jinadasa, Aerospace Engineer; Chanda Prescod-Weinstein, Theoretical Cosmologist
Gladys West, Mathematician; Bibha Chowduri, Particle Physicist

Bottom (L-R): Irene Uchida, Geneticist; Cornelia (Nel) Wieman, Chief Medical Officer FNHA, Psychiatrist
Jocelyn Bell Burnell, Astrophysicist; Laurie Rousseau-Nepton, Astronomer



Culturally Relevant Pedagogy

Co-development through relationship-building with community leaders, partners and EECD

Teachings and learning experiences together with **culturally relevant reference frames**, like Two-Eyed Seeing (Etuaptmumk)



Transforming Classrooms, Changing Minds

Mi'kmaw Moons, Ecological Cycle; Mi'kmaq Elders in conjunction with CBU Canada Research Chair in Integrative Science team
UNESCO Land as teacher: understanding Indigenous land-based education, Spruce Design
Jafar Ibn Muhammad Abu Mashar al-Balkhi, known as Abu Mashar . De magnis conjunctionibus (On great conjunctions)



Outreach in Tenure & Promotion

Transforming Systems



#1

How can we incorporate EDI into
Tenure & Promotion Processes to
create systemic change?



#2

What are the implications of including
community outreach into Tenure &
Promotion Processes?



Dalhousie University's Faculty of Science Tenure & Promotion Taskforce

Recommendation prioritize equity, diversity, inclusion, and accessibility (EDIA) considerations, structured into three key categories:

Research
Teaching
Service



Research

Multifaceted Evaluation Approach

Diverse Forms of Scholarship

Balanced Local and Global Impact

Peer Review for Non-Traditional Impacts

Teaching

Enhanced Teaching Evaluation Practices

Move beyond reliance on student learning experience questionnaires (SLEQs)

Incorporate Holistic Evaluation of Teaching (HET) Policy using evidence from:

- Students
- Peers
- Self

Service

Recognition of service that supports Departmental, Faculty and University Values

Recognition of Non-Traditional Activities

- Explicitly acknowledge and value non-traditional scholarly activities such as advocacy, outreach, and mentoring.

Call to Action

to value what is being
undervalued



Physics in the Rural Classroom

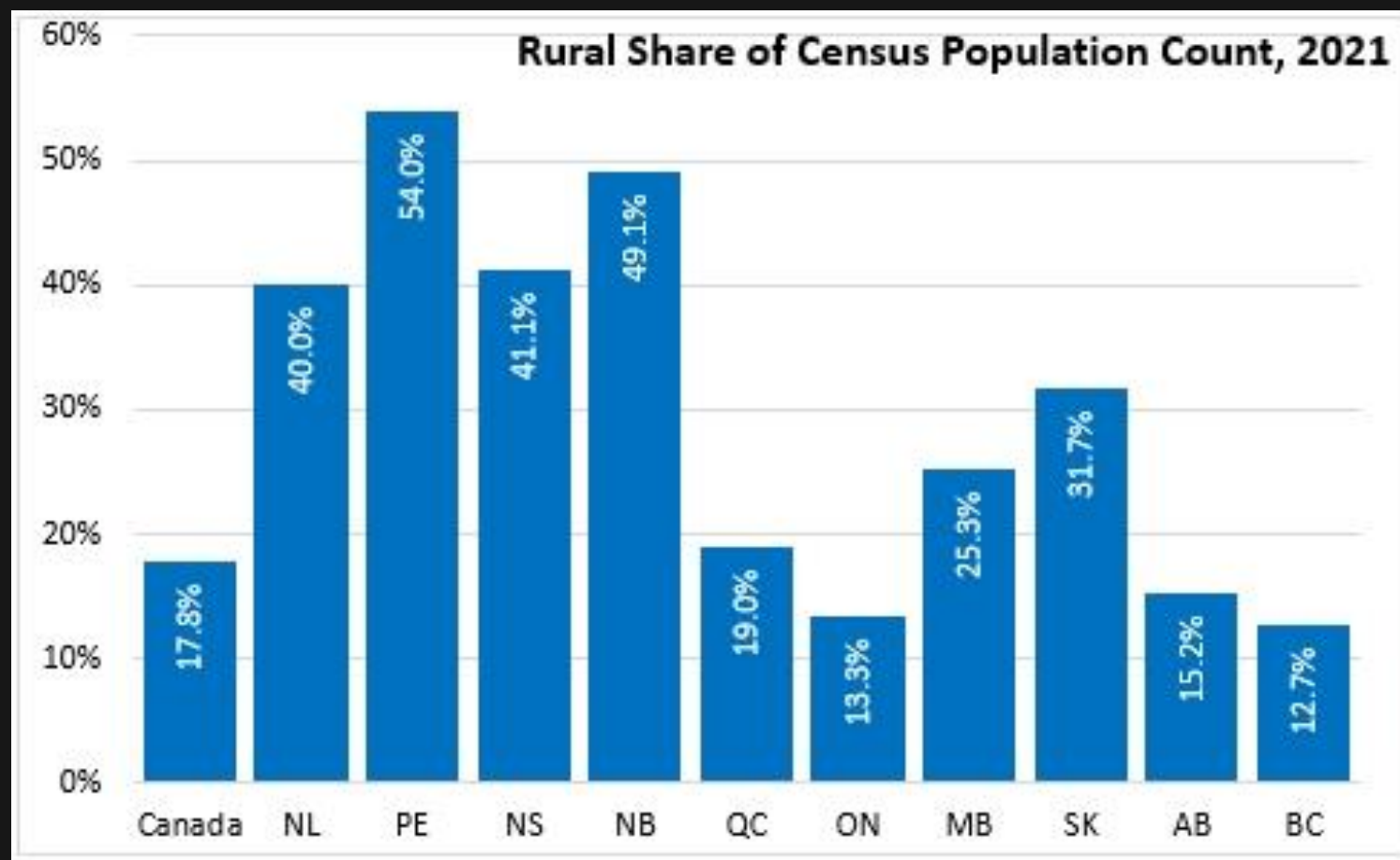
Addressing barriers to access to Physics and STEM fields for rural and remote communities in the Atlantic



Atlantic Canada: Rural & Remote Realities

Census data has shown that **44%** of the Atlantic's residents live in rural communities.

2021 data shows Prince Edward Island and New Brunswick with the highest rural shares among the provinces.



Atlantic Canada: Rural & Remote Realities

Rural Distribution of
52 Historical African
Nova Scotian
Communities

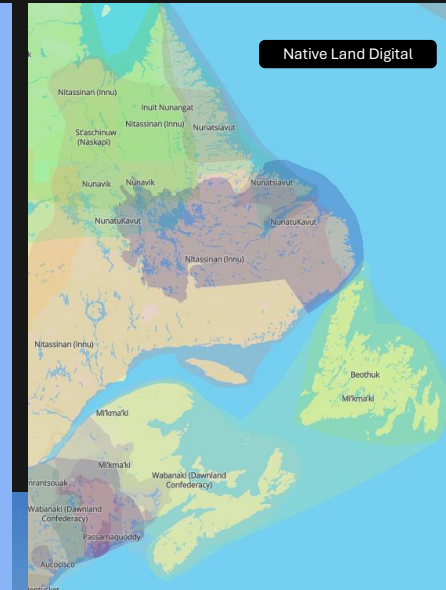
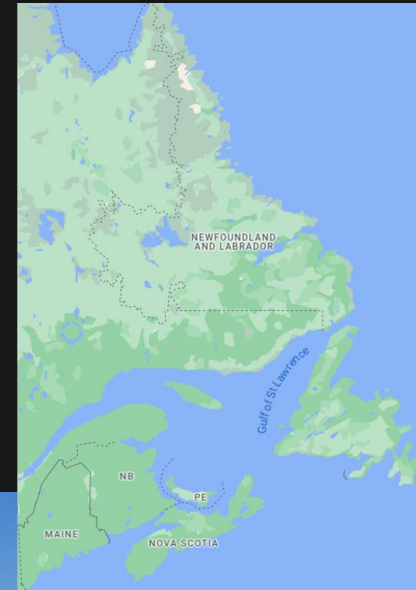


Atlantic Canada: Rural & Remote Realities

Many rural northern communities are geographically isolated,

- Limiting access to educational resources, demonstration materials
- Limiting classroom, school funding
- Prevalence of teaching out-of-field.

Many coastal communities can only be accessed by plane or boat, sea-ice permitting



Program Structure

Partner organizations will nominate volunteers with expertise in physical sciences, engineering and technology to join classes online, **role models** from Equity-Deserving Groups.

Through collaboration with Atlantic **teachers**, learning experiences to be developed will be curriculum-connected, referring to regional priorities and including Indigenous knowledges.

Four online sessions will address specific curriculum per year for each grade which means each learner will engage with 24 different units through **Grades 7 to 11**.



PHYSICS IN RURAL CLASSROOMS

Community Engagement:
Oct. 25th 2024

Launch: JANUARY 2025



Connecting schools and learners from **rural** and **remote** communities to STEM role models

Delivering high quality **curriculum-connected** learning experiences in Science and Physics for Grades 7-12

STEM ROLE MODELS

Database of **Professionals** working in STEM

Deliver the curated learning experiences virtually

Provide assistance to teachers with concepts in science and physics that have been sticking points

Speak to careers in STEM and their personal journeys

LEARNING EXPERIENCES

Database of **Curriculum-Connected** Learning Experiences

Associated materials and resources will be provided to teachers and schools

Provincial pedagogical standards will be followed

TEACHER ADVISORY GROUP

Teachers representing each Atlantic province

Provides guidance on needs for teachers, particularly those teaching out-of-field

Assists with curation of learning experiences and ensuring that they are appropriate by grade-level and province





#1

What are some barriers to engagement that should be considered for STEM Role Models?



#2

What are some possible solutions to those barriers?



#3

How do you see the wider Physics community supporting this program?



Questions & Discussions

Thank you!

