

Sky Stories: The Art of Science Outreach

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CAMPUS

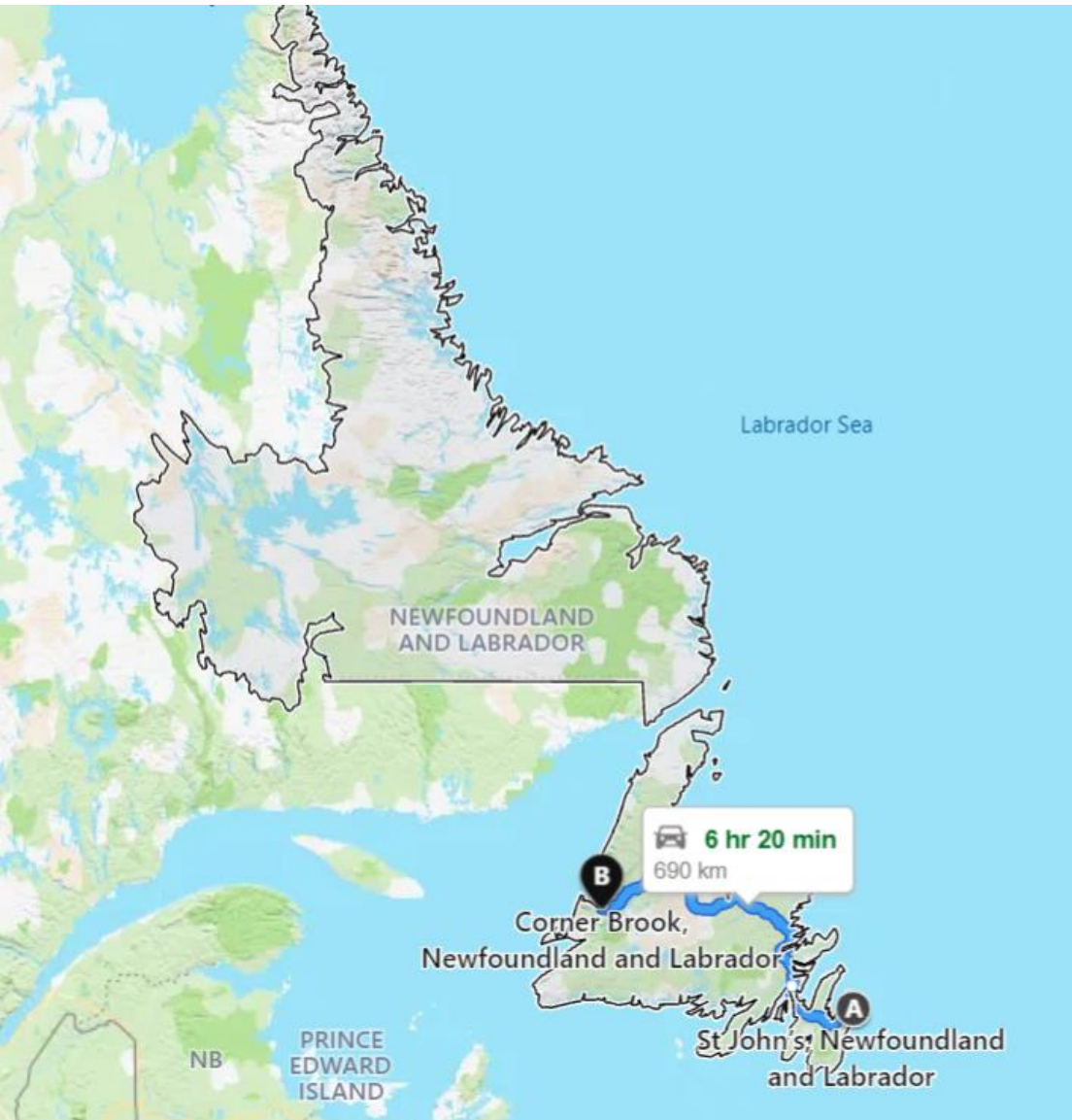


Canadian Association of Physicists

SUPPORTING PHYSICS RESEARCH AND EDUCATION IN CANADA

We acknowledge that the lands on which Memorial University's campuses are situated are in the traditional territories of diverse Indigenous groups, and we acknowledge with respect the diverse histories and cultures of the Beothuk, Mi'kmaq, Innu, and Inuit of this province.





Total Population: 525,000

One university: MUN
(Tuition: 2,550 CAD)

St. John's (Central Campus):
114,000

Corner Brook (Grenfell Campus):
20,000

26% of Grenfell Campus students
are Indigenous

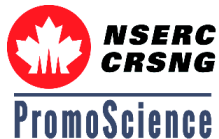


Abstract:

Our universe is a dynamic, fascinating, and beautiful place. Yet, physics is sometimes perceived as being dry, irrelevant and lacking cultural engagement and creativity. To mitigate that perception, we are engaging two powerful partners: our physical universe and our local culture.

The talk will describe a scientific and cultural outreach program we developed for youth in Newfoundland, especially rural youth, girls and Indigenous students, which offers activities featuring female and Indigenous role models, engage Indigenous story-telling, discuss a wide range of science-related career opportunities, and emphasise a diverse set of skills required in modern science.

We'll also discuss challenges and opportunities brought by the Covid-19 pandemic and lessons learned from engaging teenagers online.



Objectives:

The main objective is to support future innovation and economic diversification by attracting local youth to science-related careers by promoting natural sciences to youth in Newfoundland and Labrador, particularly to [youth in rural and remote areas](#), [girls](#), and [Indigenous students](#).

We build on the [complimentary knowledge](#), expertise, and resources at [MUN's Grenfell Campus](#), the [Qalipu First Nation and Parks Canada](#) to deliver long-term, sustainable scientific and cultural outreach program on campus, in schools, and national and provincial parks.

We strive to coordinate our science-outreach content with the [existing provincial curriculum](#), develop resources for teachers, and participate in professional teacher development, especially in the areas related to [subatomic physics and astrophysics](#).





07/06/2021

S. Barkanova, CAP Congress 2021

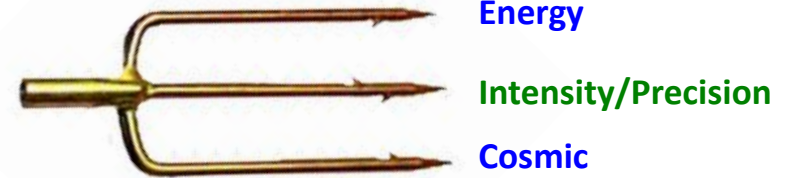


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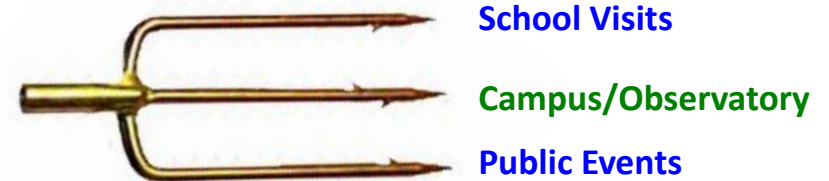
The three-prong approach for BMS search:

Search for Physics Beyond Standard Model
- my own research field.



The same idea for science outreach:

- Visits to schools with curriculum-relevant lectures and demos supplemented by the cultural content; resources for teachers.



- Observatory tours and other physics-related activities for youth groups on campus.
- Community events on campus and parks.

From spring 2020: Webinars



[Physics + Culture], [Physics + Art], [Physics + Careers]: Examples

[Muin and the Seven Bird Hunters](#) (Muin aqq L'uiknek Te'sijik Ntuksuinu'k) – explore the Muin story from [the book](#) (Lilian Marshall, Murdena Marshall, Prune Harris and Cheryl Bartlett (2017)) or YouTube, with students following the motion of Muin, a bear chased by birds (Ursa Major) around Tatapn (Polaris) with [Star Finders](#).

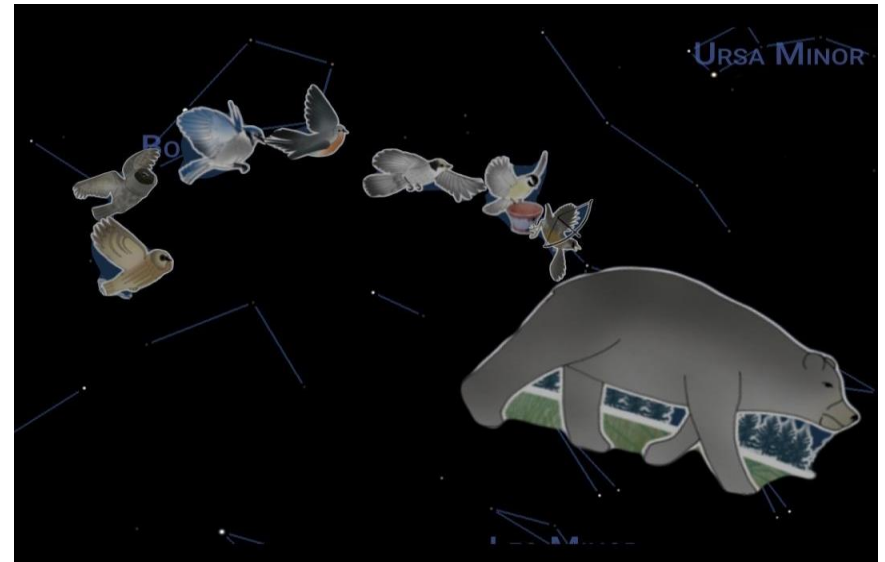
[Your Brain on Lighting](#) – students learn about EM spectrum and spectroscopy, and experiment with colour mixing and lighting.

[Modern Physics Research and Careers](#) – explore the most exciting areas of physics research with a prof or undergraduate students with research experience, discuss a wide range of science-related career opportunities, and emphasise a diverse set of skills required in modern science.



Muin and the Seven Bird Hunters (Muin aqq L'uiknek Te'sijik Ntuksuinu'k)





“Mi’kmaq Night Sky Stories; Patterns of Interconnectiveness, Vitality and Nourishment”, by Lilian Marshall, Murdena Marshall, Prune Harris and Cheryl Bartlett, CAPjournal, No. 9 October 2010.

https://www.researchgate.net/publication/238590918_Mi'kmaq_Night_Sky_Stories_Patterns_of_Interconnectiveness_Vitality_and_Nourishment

“Muin – Story”, [Muin and the Seven Bird Hunters \(English\) - YouTube](#)

Muin and the Seven Bird Hunters

YouTube^{CA}

Muin and the Seven Bird Hunters

Sign in

Tatapn
(Polaris or North Star)

Muin and the Seven Bird Hunters (English)

942 views • Jul 29, 2020

24 1 SHARE SAVE ...



Jipjaws is very hungry. He jumps onto Mr. How. Jipjaws gets his red chest.



Indigenous sky stories by youth theatre



Your Brain on Lighting

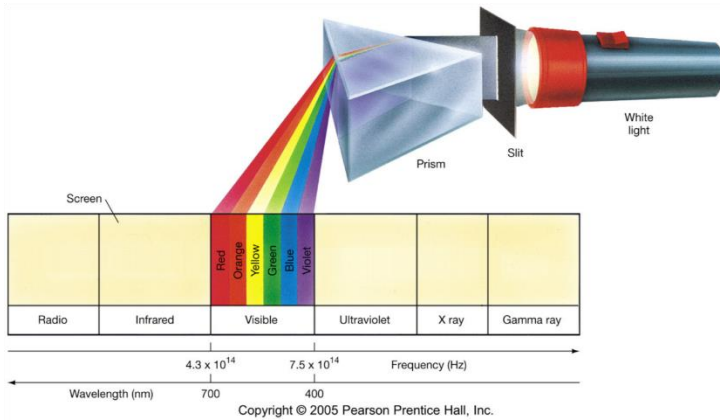
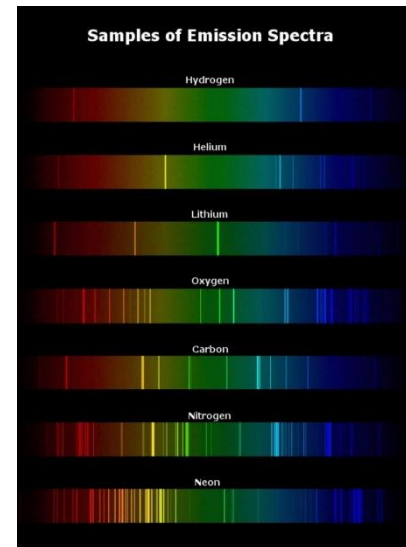
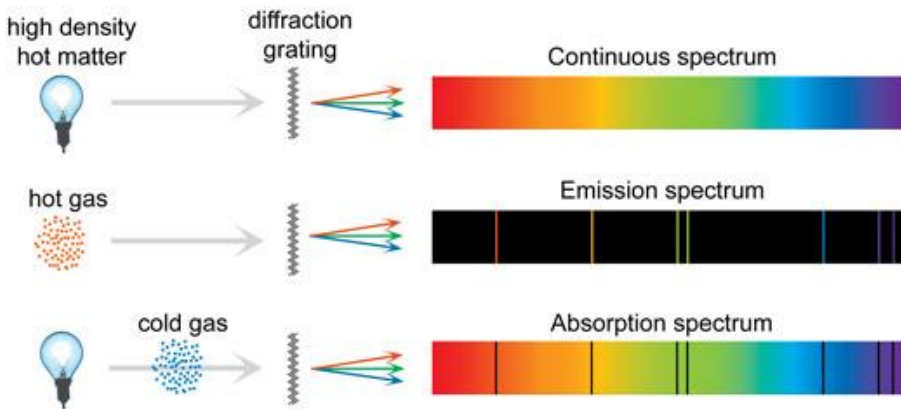
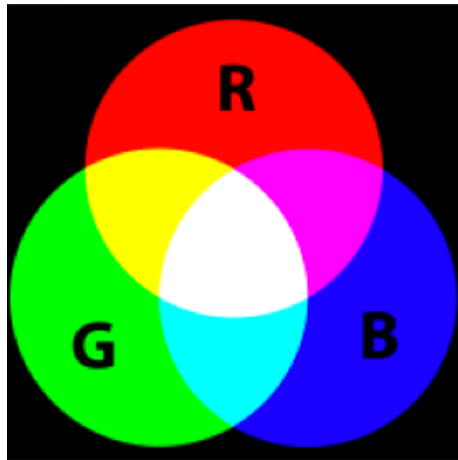


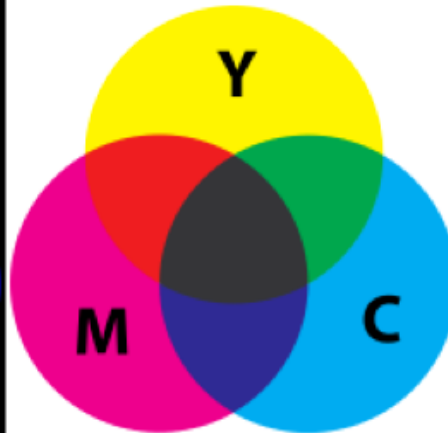
Image by Lisa Alisa



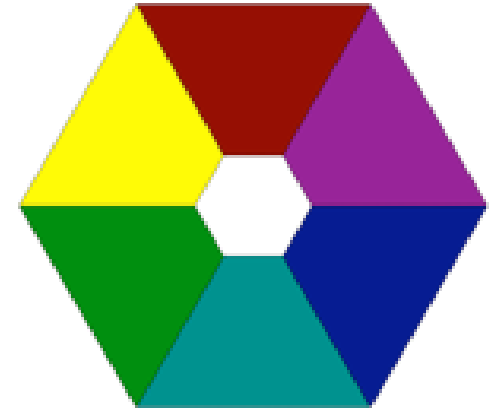
- Primary Colours of Light: RED + GREEN + BLUE = WHITE
- Additive Vs. Subtractive Mixing



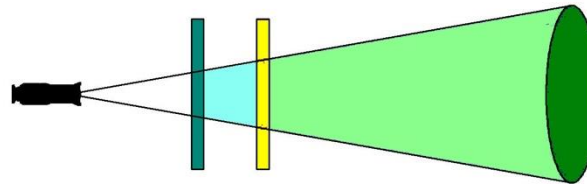
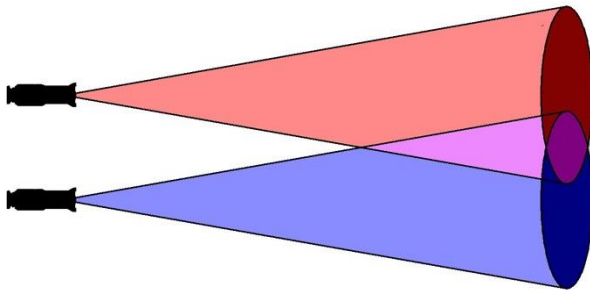
Additive RGB Color



Subtractive CMY(K) Color



Complementary Colours





Girl Guides visit to campus, Grades 10-12

Free Public Events Coming Up Next:

Grenfell Observatory Presents: "Navigating by Sky Day and Night: Past and Present", 8:00pm – 10:00pm, Tuesday, September 17th, AS 2026.

Do you know how to find the North Star? How to navigate by the Sun? Join us for a talk about Celestial Navigation with a bit of Newfoundland history, storytelling, a trivia game with prizes, and a visit to the Grenfell Observatory. All ages, free admission. Registration required – please go to [Grenfell Observatory Presents: "Navigating by the Sky: Past and Present"](#), or search for Grenfell events on Eventbrite.

Part of [Science Literacy Week](#) September 16 – 22, 2019, highlighting Canada's scientists and science communicators from coast-to-coast.

In partnership with [Grenfell Campus](#), [NSERC PromoScience](#), [Qalipu First Nation](#) and [Parks Canada](#).





07/06/2021

S. Barkanova, CAP Congress, 2021

Tuesday, May 5th, 2020

Grenfell Matters Online presents: "Subatomic Physics Research in Canada: Strategy to our Success"

Time: 3:00pm NST

Dr. Svetlana Barkanova is participating in **Grenfell Matters Online!** Join her Tuesday, May 5th at 3pm on the Grenfell Campus [Facebook Live](#) while she shares her passion for subatomic physics. Click [here](#) for Dr. Barkanova's abstract, bio and more information on Grenfell Matters Online

Tuesday, March 10th, 2020



In celebration of International Women's Day: "Women in STEAM"

Time: 5:30pm-7:00pm NST

FC2014 (Forestry Centre), Grenfell Campus, MUN.

Women are still drastically underrepresented in [Science, Technology, Engineering, Arts and Mathematics](#) (STEAM) fields, as well as in positions of influence. Let's narrow the gap! Please join as for several short talks celebrating talented women in our community, and fun Q&A with prizes. Everyone is welcome!

[Click here for Abstracts](#)

Friday, March 6th, 2020

"Penguins and Physics: Looking for Dark Matter in Antarctica", by Dr. S. Barkanova

Wednesday, May 27th, 2020



The Universe of Opportunities: Women in STEM

Time: 11:00am-12:00pm NST

Join us, Wednesday, May 27th from 11:00am-12:00pm for a webinar about careers in STEM (science, technology, engineering and math) fields! The webinar will include 5 minute presentations, plus questions & discussion between and following the talks. We will have presentations by:

- Dr. Julie Sircom, Associate Professor, School of Science & the Environment, Faculty of Environmental Science, Grenfell Campus, Memorial University of Newfoundland
- Angelina Payne, Public Outreach Education Officer, Western Newfoundland and Labrador Field Unit, Parks Canada
- Kathryn Hong, Coordinator for Outreach Activities, Faculty of Engineering and Applied Science, Memorial University
- Caryn Massie, P. Eng, Protection and Control Engineer at Newfoundland and Labrador Hydro
- Angela Brockway, Education Outreach Officer with Qalipu First Nation in Corner Brook.
- Dr. Rebecca Milley, Assistant Professor, School of Science & the Environment, Faculty of Computational Mathematics, Memorial University of Newfoundland
-

Wednesday, May 13th, 2020

The Universe of Opportunities: Careers, Education & Funding in STE(A)M

Time: 2:00-3:00pm NST

Join us, Wednesday, May 13th from 2-3pm for a webinar about careers, funding, and education in STEAM (science, technology,



Monday, March 8, 2021, International Women's Day

"Celebrating Indigenous Women in Physics"

Time: 14:30 – 16:00 NST, 01:00 – 02:30 EST

About this event

This unique and engaging virtual event will combine talks, interactive activities, musical interludes, artwork and science conversations.

Featured Speakers

- **Julia Doucette-Garr** - Student, University of Saskatchewan, Founder of the first student chapter of the Canadian Indigenous Science and Engineering Society
- **Laurie Rousseau-Nepton** - Postdoctoral Researcher, Canada-France-Hawaii Telescope, First Indigenous woman to get a PhD in astrophysics in Quebec
- **Angela Brockway** - Experience Development Officer, Qalipu First Nation, Newfoundland and Labrador
- **Jessica Kolopenuk** - Assistant Professor, Faculty of Native Studies, University of Alberta

Moderator and Ally

Eden Hennessey - Manager, Centre for Student EDI, and Laurier Centre for Women in Science (WinS) Research Coordinator, Wilfrid Laurier University



No tours at the moment due to Covid-19 pandemic, unfortunately, but please join us for webinars!

Tuesday, June 1st, 2021

The Continuing Search for Life: From Missions to Mars to Exoplanet Surveys

Time: Tuesday, June 1st, 7:00 – 8:00 pm NDT (6:30 – 7:30 pm ADT, 5:30 – 6:30 pm EDT)

Presenter: Dr. Hilding Neilson, Department of Astronomy and Astrophysics, University of Toronto

Location: Zoom, at <https://us02web.zoom.us/j/89512043704?pwd=VE85N0hiVXFpd3MrQjBsZHB1Wi96dz09>

(Meeting ID: 895 1204 3704

Passcode: 357632)

Abstract: When we look into the vastness of the night sky, one of the biggest questions one can ask is if there is life beyond the Earth. Given the size of the Universe and the number places life might exist the answer is most likely yes, there is life in the Galaxy and maybe even elsewhere in our own Solar System, but where might life be? In this talk, Dr. Neilson will review the current understanding of where life might be in the Solar System and some of the evidence for life on Mars, Venus, and even on the moons of Jupiter. He will leap from the Solar System to discuss how in the coming decades astronomers expect to find Earth analogues orbiting other stars and how we will search for signatures of technology and of biology and maybe confirm that we are not alone in the Galaxy.

Bio: Dr. Hilding Neilson is an assistant professor in astronomy at the University of Toronto where he studies stellar physics and exoplanets while working to integrate Indigenous knowledges and methodologies into the academic study of astrophysics. He is Mi'kmaw and a member of the Qalipu First Nation of Newfoundland.

Summary and Conclusions

We focus on youth in **rural and remote areas, girls, and Indigenous students**, featuring women and Indigenous **role models**, engaging **story-telling**, discussing **career opportunities**, and emphasising a **diverse set of skills** required in modern science such as cooperation and communication.

The key to making the program **sustainable** is utilizing the local knowledge and **complimentary expertise and resources**.

Coordinating science-outreach content with the **existing provincial curriculum** is still our ongoing challenge, but our physics majors are looking for creative fits.

Covid-19 pandemic forced us to re-imagine our delivery mode. As a result, we are reaching many more participants in all regions of Newfoundland and Labrador via webinars.



THANK YOU!

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Publications: “[Subatomic Physics Education and Outreach in Newfoundland](#)”, LP2019

“Open Space: Engaging Teens in Western Newfoundland in Physics and Astronomy”, PiC2021

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