



VERNA J. KIRKNESS
EDUCATION FOUNDATION

Juliette Mammei



University
of Manitoba



The Kirkness Program

Improving Indigenous Student Success in Science

About the program

- Originally the “Family Food Research Foundation”, est. in 2008
- The VJKF Program was first offered in 2012 at the University of Manitoba
- Expanded to the University of Saskatchewan in 2015, UBC in 2016 and just keeps growing!
- In 2019 (last in-person program before COVID) 130 students participated with the mentorship of 53 professors and research assistants



Verna J. Kirkness is a member of Fisher River Cree Nation in Manitoba. She agreed to lend her name to the foundation in 2010.



Typical program (sans COVID restrictions)

- Students arrive on Sunday and leave the following Saturday
- Mentors meet and escort them to the lab on the first day
- Meals are provided to the students, including lunch
- They're in the lab Monday afternoon to Friday morning (9am-4:30pm) – this is the only time you are responsible for
- The students have to prepare and present a summary of their experience (7 times hosting – 7 totally different presentations!)
- The Feast is a wonderful experience; I've spoken 2x and attended one add'l time

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
8:00		Breakfast	Breakfast	Breakfast	Breakfast	Breakfast	Breakfast
8:30							
9:00							
9:30							Departures
10:00			Lab	Lab	Lab	Lab	
10:30							
11:00							
11:30							
12:00		Lunch	Lunch	Lunch	Lunch	Lunch	
12:30							
13:00							
13:30							
14:00							
14:30							
15:00	Arrive	Lab	Lab	Lab	Lab	Presentations	
15:30							
16:00							
16:30							
17:00		Dinner	Dinner	Dinner	Dinner	Dinner	
17:30							
18:00							
18:30	Pizza Party						
19:00							
19:30					Feast		
20:00							
20:30							

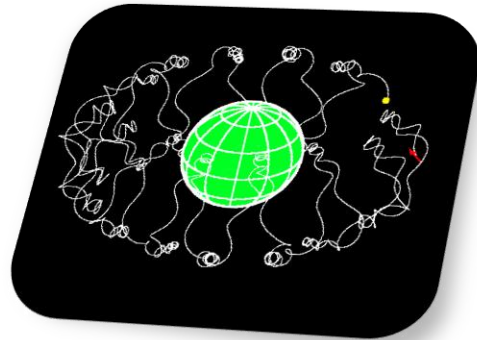
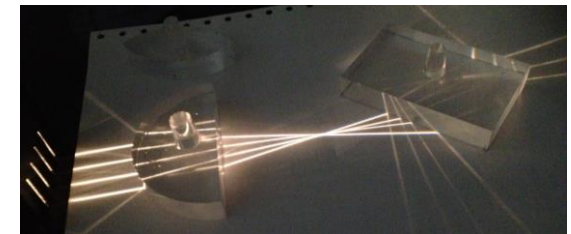
a very rewarding experience

My curriculum (I am willing to share!!!)

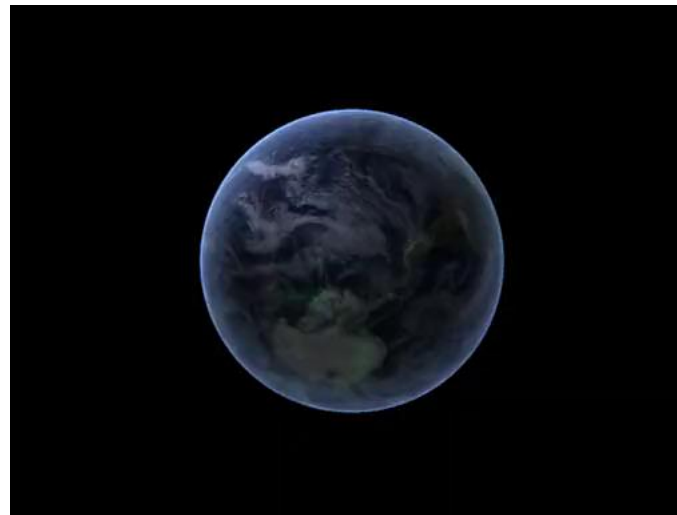
- Original intent was to have students participate in research
- My research occurs at other labs – cosmic ray tests aren't that exciting...
- Goals:
 - Relate to phenomena that are in some ways unique to where we live
 - Understand how we “see” in general and microscopic things
 - Difference between cosmic rays and cause of aurora
 - Not to simply be afraid when they hear “radiation”



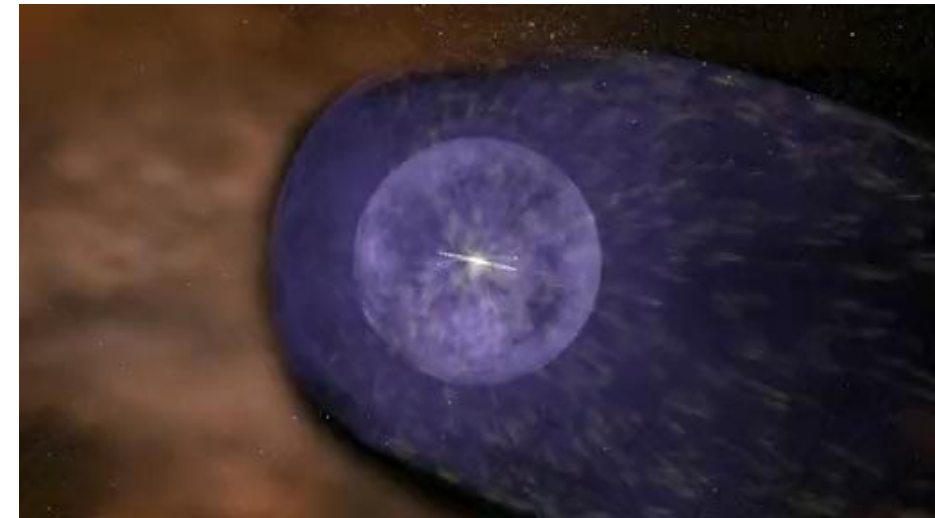
optics of halo and sun dogs



Earth's magnetic field
and how it protects us



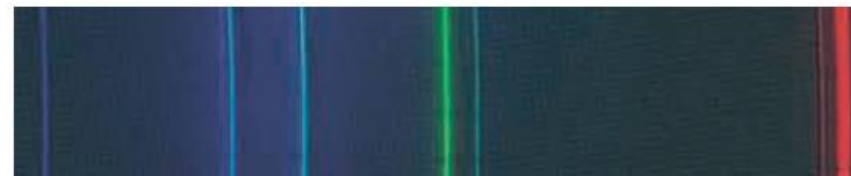
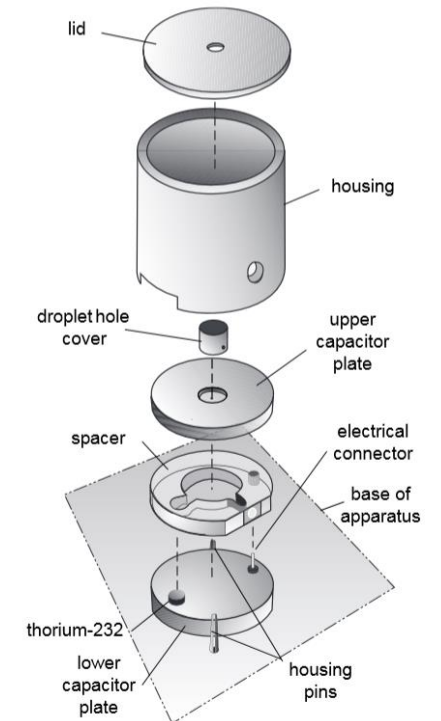
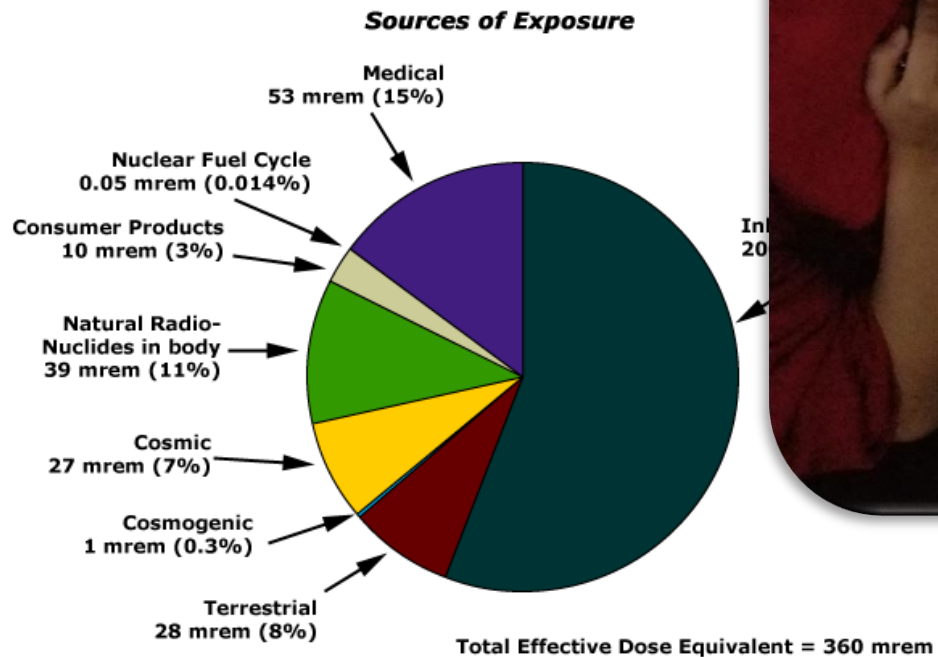
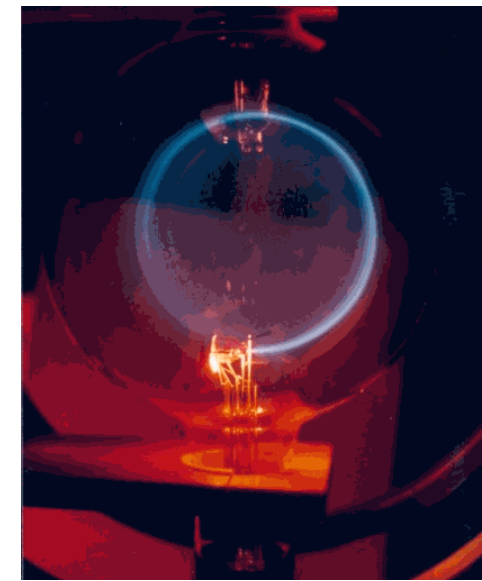
Aurora Australis



Heliopause (Artist's rendition)

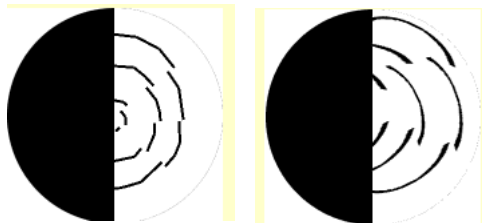
Relating to particle physics

- Do shielding measurements for different sources/shields
- e/m and Millikan oil drop – measure charge and mass of electron (pretty cool)!
- Relate EM to light with hand-held spectroscopes and gas-discharge tubes (guess the element!)
- Finale – cloud chamber

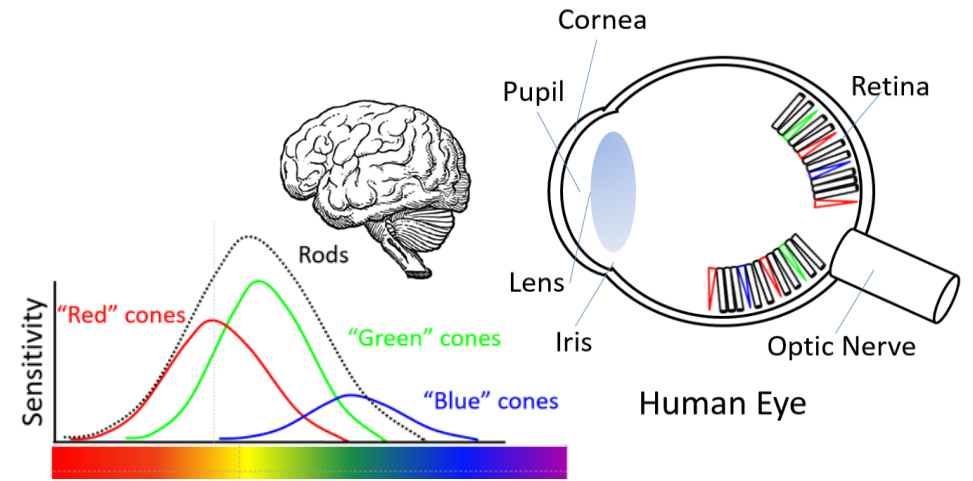


Seeing

- Continually developing a curriculum around how we “see” for outreach events – tying into Kirkness
- *Etuaptmumk* (Mi'kmaw word for Two-Eyed Seeing) - Guiding Principle brought into the Integrative Science co-learning journey by [Mi'kmaw Elder Albert Marshall](#) in Fall 2004
 - Learn to see from one eye with the strengths of Indigenous knowledge and ways of knowing, and from the other eye with Western knowledge and ways of knowing
 - You can keep your spirit intact – don't abandon your way of knowing



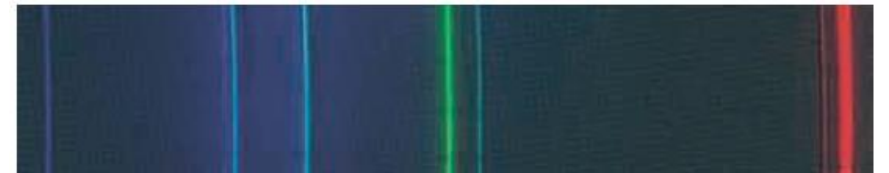
<https://faculty.washington.edu/chudler/benham.html>



To produce the beautiful yellow colour, they (Blackfoot-speaking people) employ a lemon-coloured moss from the Rocky Mountains, which grows in the fir trees.

Cree women understand how to dye a beautiful red with the roots of *Galium tinctorum* and *boreale*, and black with the bark of the alder”

<https://journals.lib.unb.ca/index.php/MCR/article/view/18145/19520>



How to participate

- If your school already participates, answer the call when it goes out
- If your school does not already participate, you can contact the Kirkness Foundation directly to learn about how to get involved.

WHICH SCHOOL SUBJECTS ARE RELEVANT TO THIS LAB?

You will enjoy working in this lab, if you are interested in high school subjects like

- Physics
- Pre-calculus
- Chemistry

You can continue to learn more in your undergraduate studies by taking courses at university in

- Physics
- Calculus

CAREERS THAT APPLY PHYSICS IN YOUR COMMUNITY:

- Laboratory researcher
- Laboratory technician
- University professor
- Medical software developer



PHYSICS

DR. JULIETTE MAMMEI'S LABORATORY
UNIVERSITY OF MANITOBA



IF YOU CHOOSE THIS LABORATORY, YOU WILL:

Spend a week in the life of a Physics student in Dr. Juliette Mammei's laboratory and zoom into the subatomic dimension to understand the forces of nature! Researchers in this lab design and simulate the magnetic spectrometers and experimental apparatus for large-scale future subatomic physics experiments.

Search for particles and forces of nature that have not yet been discovered! You will measure the charge and mass of an electron, learn about radiation and radiation safety, and gain university level experience observing, recording, and analyzing data.



VERNA J. KIRKNESS
EDUCATION FOUNDATION

Special thanks to Mike Roney for this opportunity and to Isabel Trigger and Quarknet for their help with the remote programs.