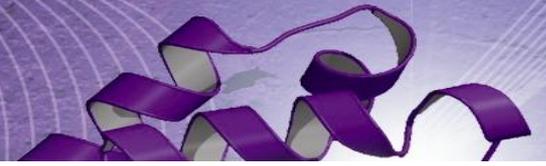


# *Offer Something Different: An Authentic Scientific Inquiry for High School Students*

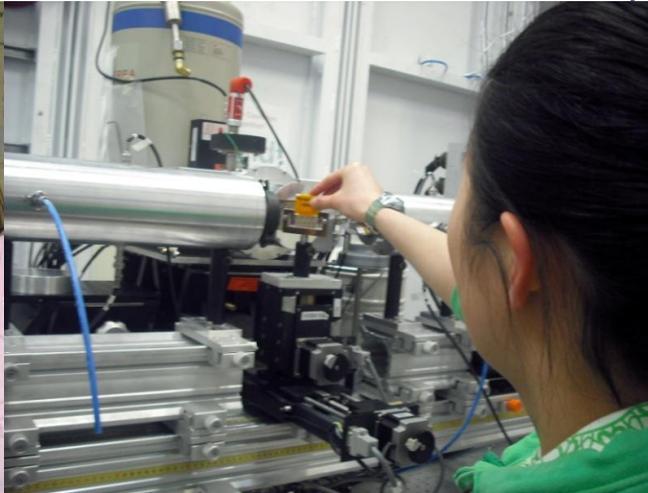
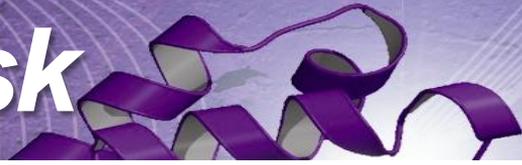
**Bringing Big Science into the Classroom: BNL's  
NSLS and CFN**

Tracy Walker  
Educational Outreach Coordinator  
Canadian Light Source



1. About Students on the Beamlines
2. Lessons Learned
3. Educational Outcomes
4. Benefits to the Facility
5. Scientific Surprises

# A formula... take a risk

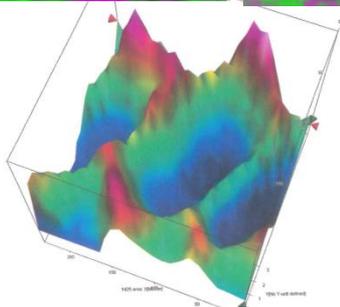
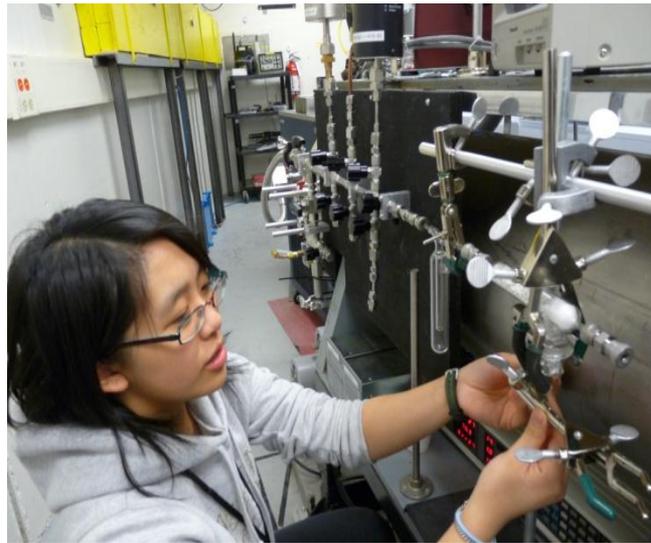
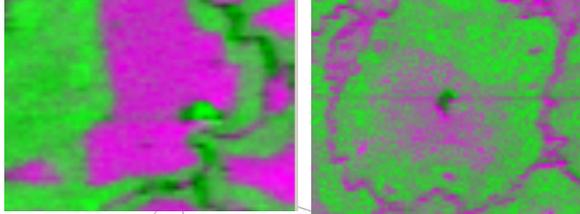


# *Elements of Authentic Scientific Inquiry*

1. Involvement in the design of the inquiry (formulation of the question or hypothesis)
2. Open-ended inquiry (where the answer is not known)
3. Gathering and analyzing data
4. Communication of the findings or results of the analysis
5. Collaboration

# Educational Outcomes

the project didn't just foster my knowledge about the synchrotron, electron-orbitals... but many other practical skills that are needed in all fields of study and careers such as decision making, preparation, time-management and focus.



It was motivating and made me reconsider how I incorporate science that is “real” into the “book” science we have to teach

# Educational Outcomes

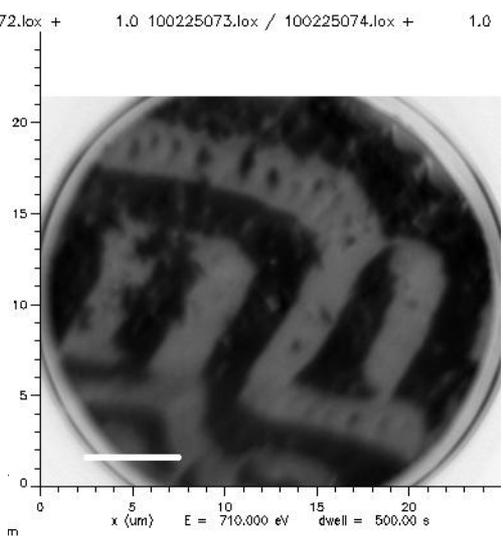
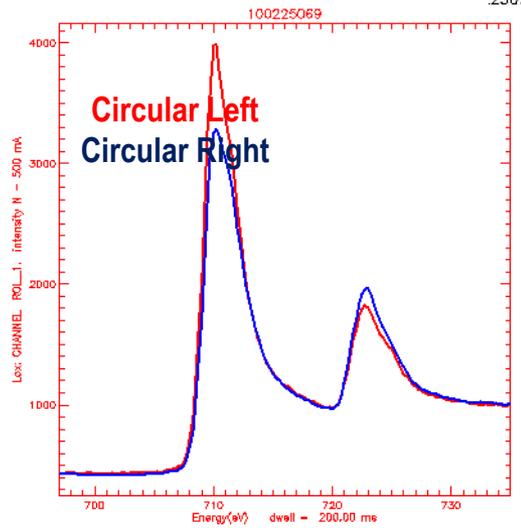
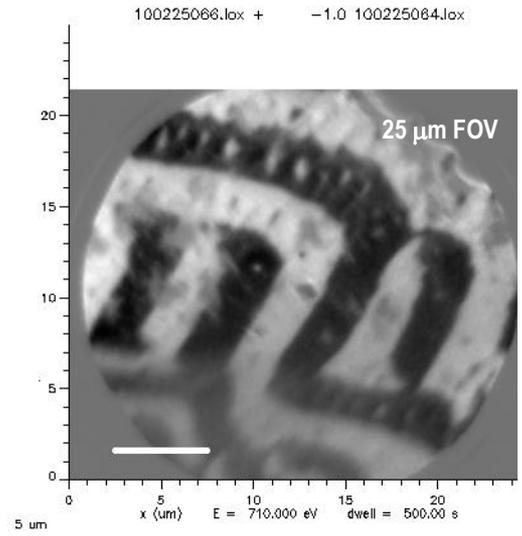
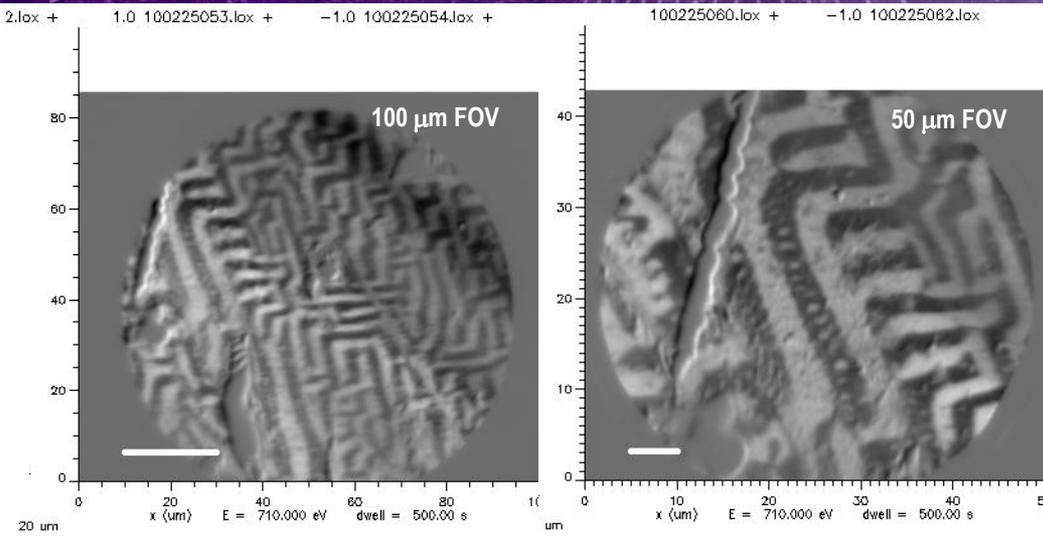
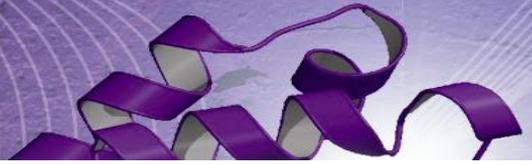
“It has had a ‘ripple effect’ in our school. This experience has been subject of conversations among the general student population and I think it has made science seem a bit more ‘cool’, a bit more fun, and a bit more respectable.”



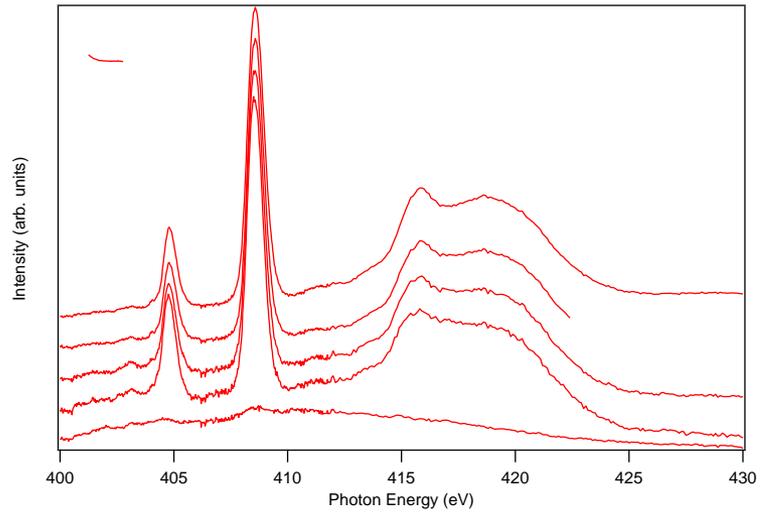
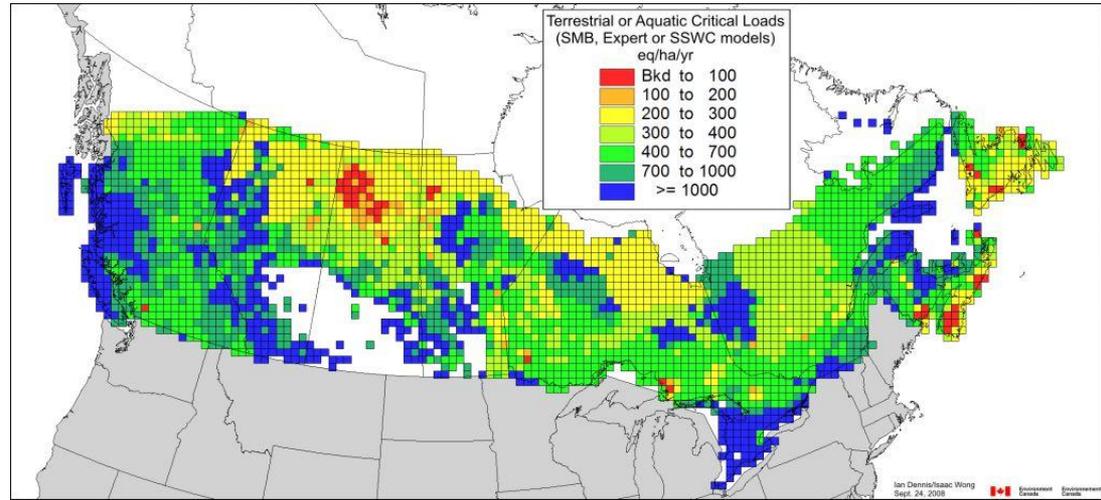
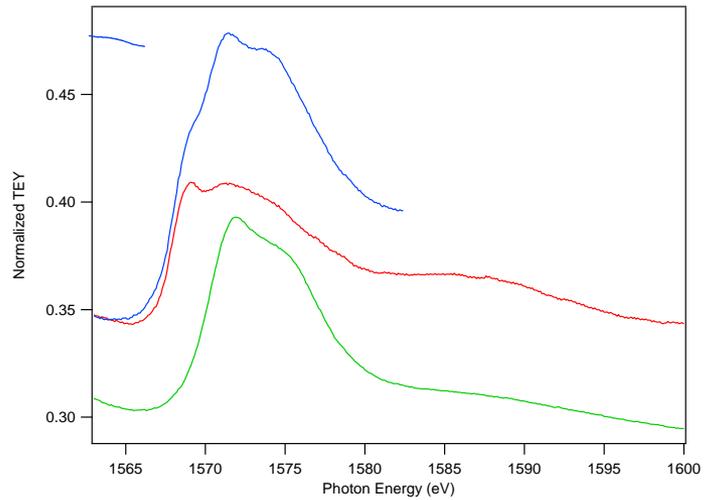
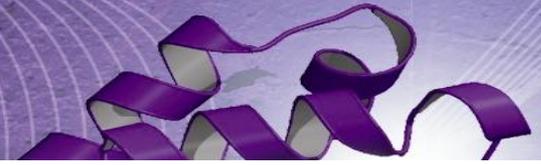
# Educational Outcomes

- “Students are engaged when they are involved in their work, persist despite challenges and obstacles, and take visible delight in accomplishing their work” (Schlechty, 2002)
- Teachers are seeking to change their approach to teaching science (interdisciplinary inquiry)
- Competition in science fairs at provincial and national levels
- Multiple invitations to speak (dinners, conferences, political venues, etc)

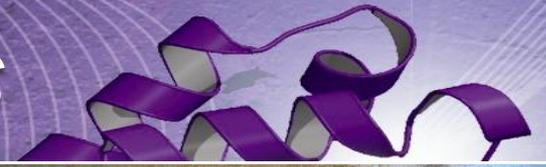
# Scientific Surprise



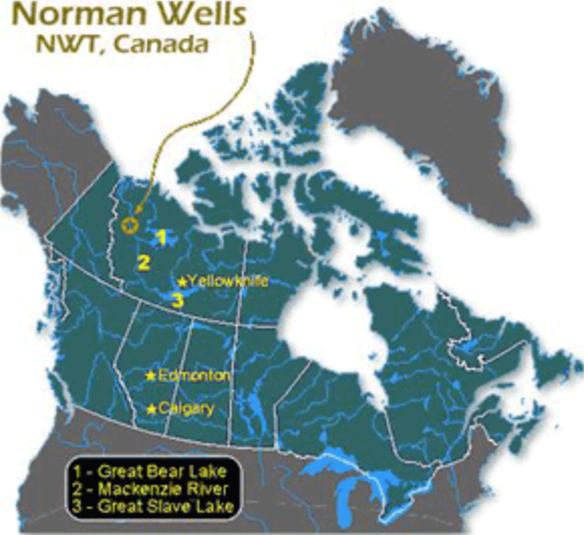
# Scientific Surprise



# Science Possibilities



Norman Wells  
NWT, Canada



Baseline data for environmental impact study

Collaboration with government agencies

Gathering traditional knowledge



# Lessons Learned

1. Time consuming
2. Let/Make the kids take the lead
3. Students need to choose to participate
4. Enthusiasm required not marks
5. Supervision x 3 (beamline, students & administrative)
6. Students need to feel ownership (inquiry, sample, results)
7. 3 days in the facility, intermittent through the year

# Benefits to the Facility

- 153 student and 26 educator evangelists (32 staff, 7 beamlines, 25 shifts)
- 3 articles in publication for peer reviewed conference proceedings
- Multiple invitations to present at school/community gatherings, board meeting dinners, government advisory meetings, and scientific conferences
- Media attention: always locally, some nationally; television, radio and newsprint; 2 documentaries (educational and science & tech focussed)
- Evidence of commitment to the education of the next generation

# Benefits to the Facility

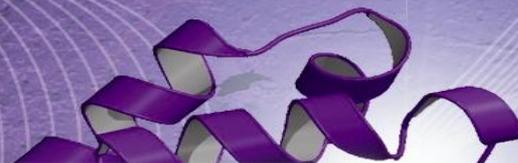
- “It’s very important to remember that facilities like this play a vital role in training the next generation of researchers. Your activities, such as the Students on the Beamlines project will continue to inspire young people to pursue science or engineering careers.”  
Isabelle Blain, NSERC VP-Research Grants & Scholarships
- Expert Committee Report reviews for the beamline upgrade, “The MAC was impressed by outreach programs for attracting and training HQP, including a workshop for high school teachers, a summer school for graduate students and a unique program aimed at high school students.”

# Acknowledgements

- NSERC's PromoScience
- CLS Inc and staff
- NSLS & CFN
- Antonio Lanzirotti

Thank you for your attention

# Funding Partners



38 supporting University Partners and growing...