


How to write a successful agriculture proposal to the Canadian Light Source (CLS)

Chithra Karunakaran

January 31, 2020

<https://www.lightsource.ca/>



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Outline

- Beamtime access mechanisms
- General user access
 - Peer review process
 - Writing successful proposals
 - Selecting beamlines
- Agriculture website
- Before and after beamtime
- Questions?
 - What other things we can do for you?

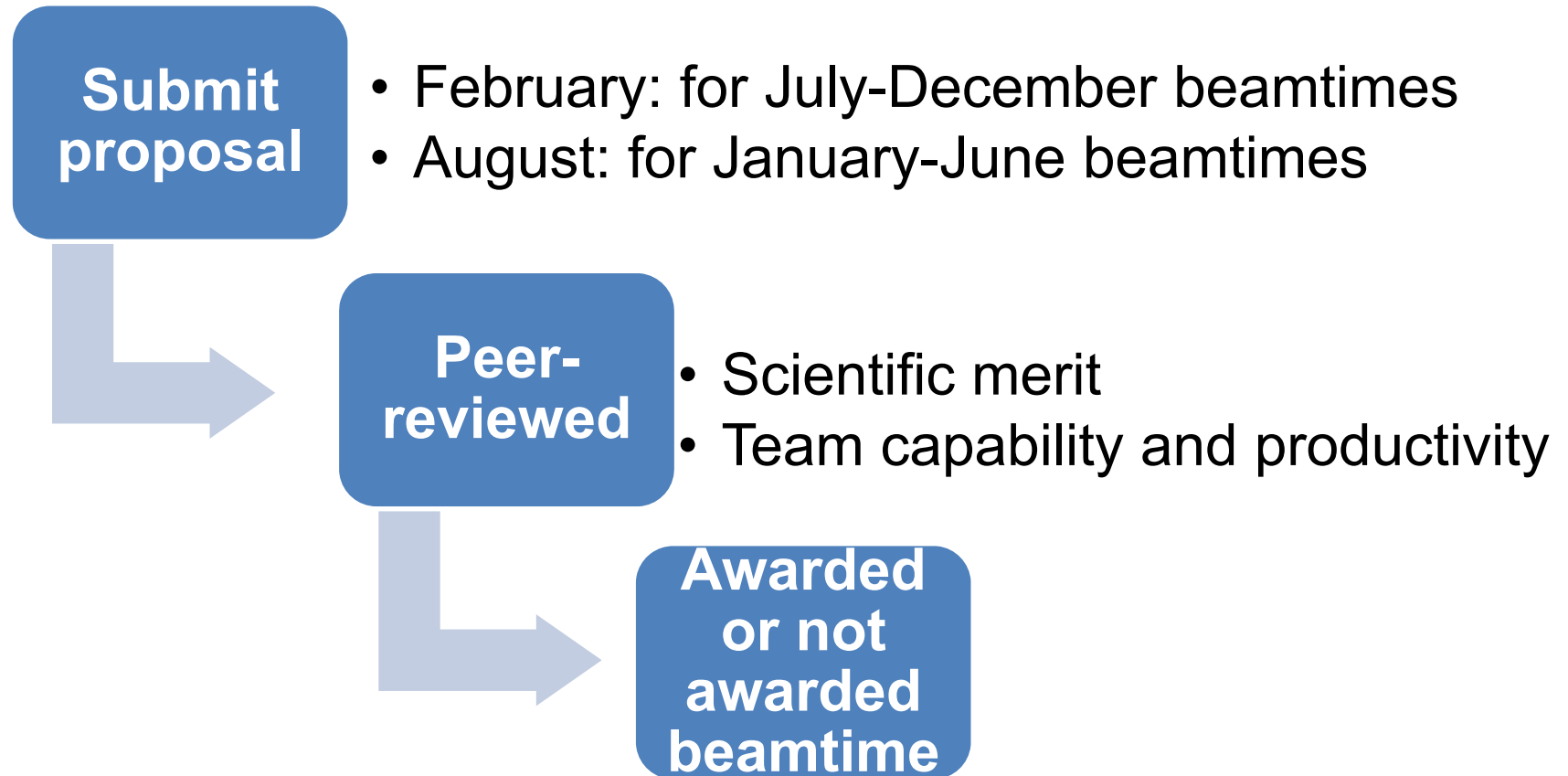


Beamtime access mechanisms

- General user access
 - Users submit proposals that are peer-reviewed and ranked
 - \$1/1 shift (8 hours) of beamtime
- Purchased access
 - No proposal submission and no peer-review
 - For proprietary work
- Rapid access
 - Proposals submitted, internal review, for proof-of-concept works only



General User Proposals



Present call closes on February 26, 2020

Call for proposals: https://www.lightsource.ca/all_other_beamlines

Deadlines: https://www.lightsource.ca/call_for_proposals

Other than General User Access

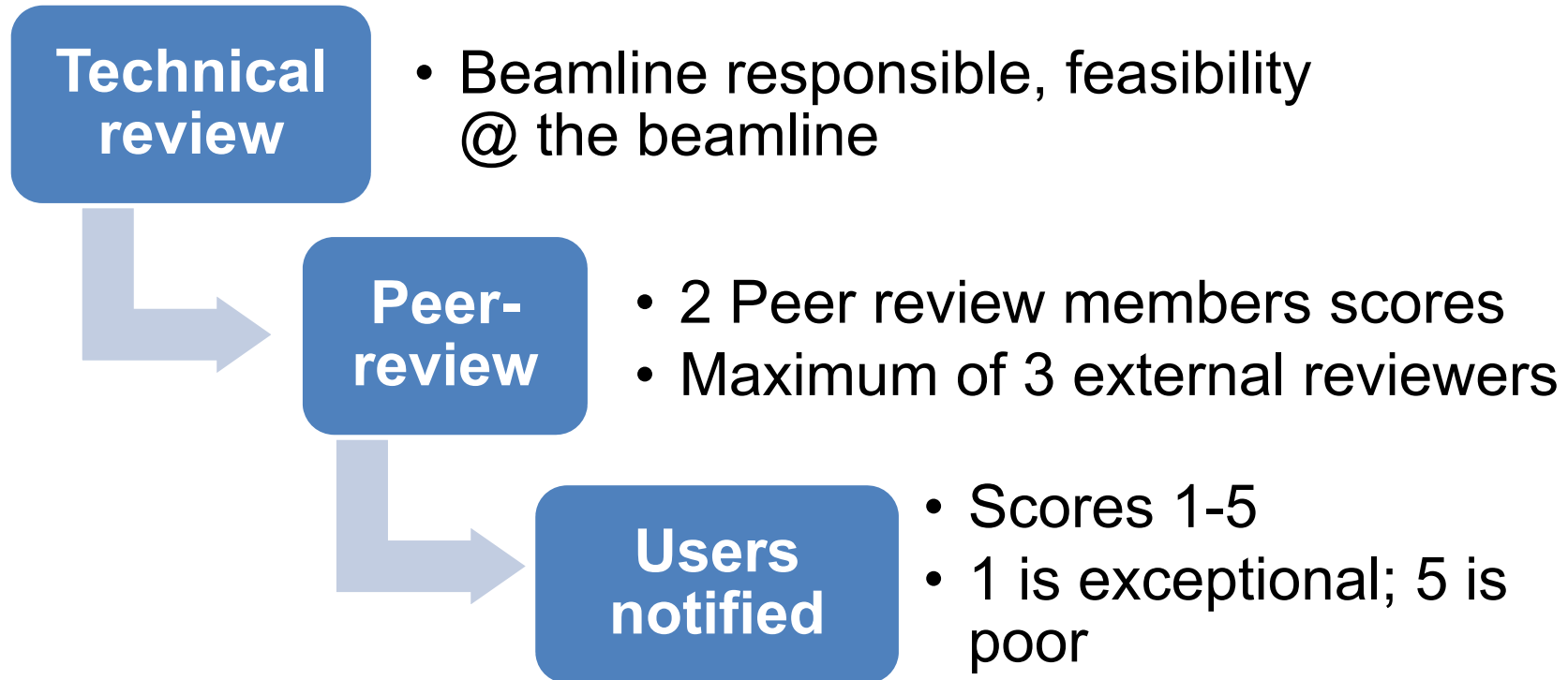
Purchased access

- For proprietary work
- For fast access
- Industrial science group

Rapid access

- Proof-of-concept work
- Complete a paper or thesis (only few samples)
- Internally reviewed

Peer-review Process



General User Proposals

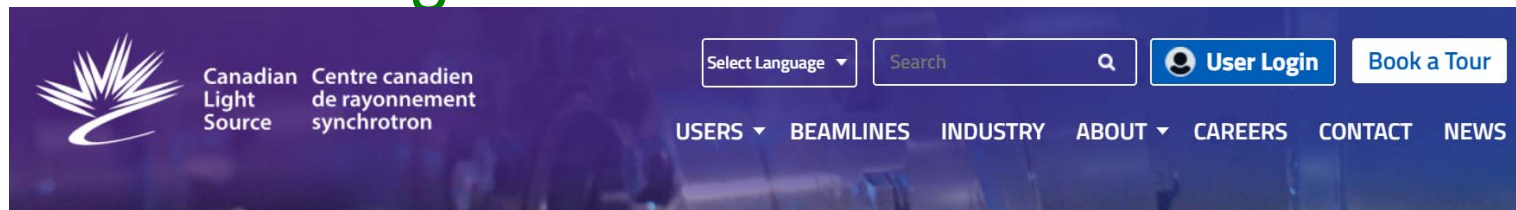
Submit proposals

- New proposal – submit a new proposal
 - Attach (max: 1 page) any relevant or preliminary results
- Existing proposal
 - Good score ($\sim < 2.0$), request beamtime
 - Score > 2.0 – clone and edit the proposal and re-submit through the peer-review process
 - Address peer-reviewers comments
 - Attach (max: 1 page) any relevant or preliminary results

General User Proposals

New user

- Become a CLS user
 - Create a login credential



Video on new user registration:

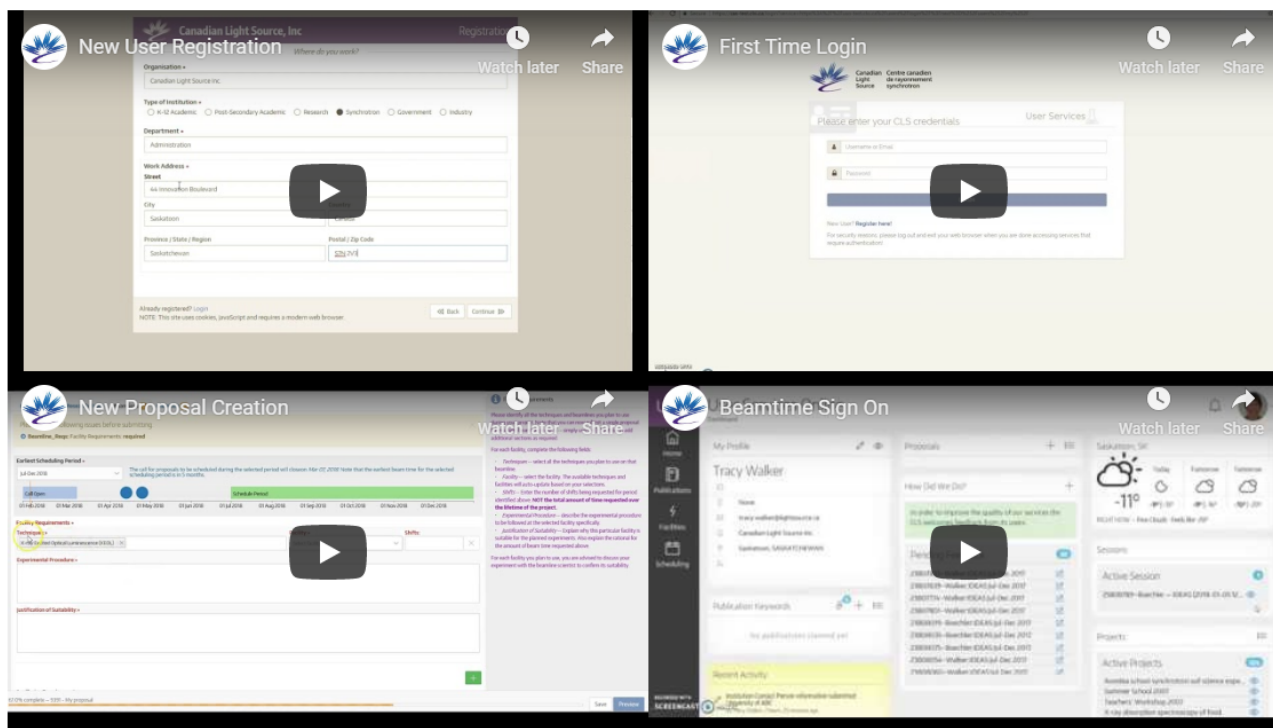
https://www.lightsource.ca/clsi_web_portal_how_to_create_and_manage_your_proposals

General User Proposals

Creating and managing your proposal

Videos:

https://www.lightsource.ca/clsi_web_portal_how_to_create_and_manage_your_proposals



Questions: email: CLS.User-Office@lightsource.ca; phone: 306-657-3700



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General User Proposals

New proposal

- Start a **new proposal** or **edit a proposal**

The screenshot displays the User Services Online (USO) dashboard for Chithra Karunakaran. The interface includes a navigation sidebar on the left with options like Home, Publications, Proposals, Permits, Projects, Facilities, and Scheduling. The main content area is divided into several sections:

- My Profile:** Displays user information for Chithra Karunakaran, including her professional status, phone number (3063410400), email (chithra.karunakaran@lightsource.ca), and address (44 Innovation Blvd, Saskatoon, S7N 2V3, SASKATCHEWAN, CANADA).
- Proposals:** A highlighted yellow box contains a message: "The call for proposals to be scheduled during the period 2020-07-01 – 2020-12-31 is currently open with a submission deadline of 2020-02-26 at noon." Below this message is a button labeled "+ Create a Proposal".
- Draft Proposals:** A blue-bordered box shows a list of draft proposals, including one titled "test" with a description "Spectral analysis of elements in bovine hoof ti...".
- Reviews:** A section titled "Reviews Needing Attention" indicates that there are currently no reviews requiring attention.
- Weather:** A weather widget for Saskatoon, SK, showing a current temperature of -4°C and a forecast for the day.
- Feedback:** A green banner encourages users to provide feedback to improve service quality.
- Beam Time Pending Feedback:** A section with 5 items, including "MID-IR-AGILENT – 31G10427~Chebli" and several "SM – 31G10427~Chebli" entries, each with an edit icon.

Proposals

Apply for Beamtime x Edit Proposal - CLS User Services x +

user-portal.lightsource.ca/proposals/10854/edit

USO Edit Proposal

Dashboard / My Proposals / 10854 - test

124

Special Request Proposal for Cycle 31 (Jan-Jun 2020)

The call for proposals for Cycle 31 (Jan-Jun 2020) closed on Aug 28, 2019. Submissions for General User Access will be considered for discretionary time only, until the next call for proposals.

If you wish a proposal to be considered for General User Access, please contact the User's Office for support on CLS.User-Office@lightsource.ca

Call Open Schedule Period

Aug 2019 01 Sep 2019 01 Oct 2019 01 Nov 2019 01 Dec 2019 01 Jan 2020 01 Feb 2020 01 Mar 2020 01 Apr 2020 01 May 2020 01 Jun 2020

Any substantial amendment to a proposal should be discussed with a beamline responsible no later than one month before scheduled beamtime.

Description Research Team Beamlines Materials



Agriculture research

Hard X-rays

Structural and functional imaging - BMIT

Elements and elemental speciation

Heavy elements

Detection limit: ppb for heavy elements

Soft X-rays

Elements and elemental speciation

B, C, N, O, K, Ca, Na, Mg, Fe, Al, Si, S, P

Detection limit: >2% for organics and ppm for other elements

Infrared

Organic macromolecules

e.g. total protein, lipids, carbohydrates, lignin, cellulose, hemicellulose, pectin

Detection limit: >2%



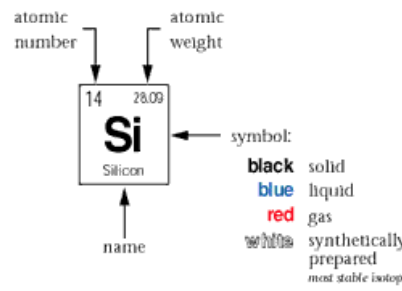
Selecting Beamlines

X-ray Properties of the Elements

Click on an element to see its properties



1 1.01 H Hydrogen																	2 4.003 He Helium	
3 6.94 Li Lithium	4 9.01 Be Beryllium																	10 20.18 Ne Neon
11 22.99 Na Sodium	12 24.31 Mg Magnesium																	18 39.95 Ar Argon
19 39.10 K Potassium	20 40.08 Ca Calcium	21 44.96 Sc Scandium	22 47.90 Ti Titanium	23 50.94 V Vanadium	24 51.996 Cr Chromium	25 54.94 Mn Manganese	26 55.85 Fe Iron	27 58.93 Co Cobalt	28 58.70 Ni Nickel	29 63.55 Cu Copper	30 65.37 Zn Zinc	31 69.72 Ga Gallium	32 72.59 Ge Germanium	33 74.92 As Arsenic	34 78.96 Se Selenium	35 79.90 Br Bromine	36 83.80 Kr Krypton	
37 85.47 Rb Rubidium	38 87.62 Sr Strontium	39 88.91 Y Yttrium	40 91.22 Zr Zirconium	41 92.91 Nb Niobium	42 95.94 Mo Molybdenum	43 (98) Tc Technetium	44 101.07 Ru Ruthenium	45 102.91 Rh Rhodium	46 106.42 Pd Palladium	47 107.87 Ag Silver	48 112.41 Cd Cadmium	49 114.82 In Indium	50 118.69 Sn Tin	51 121.75 Sb Antimony	52 127.60 Te Tellurium	53 126.90 I Iodine	54 131.30 Xe Xenon	
55 132.91 Cs Cesium	56 137.33 Ba Barium	57 138.91 La Lanthanum	72 178.49 Hf Hafnium	73 180.95 Ta Tantalum	74 183.84 W Tungsten	75 186.21 Re Rhenium	76 190.23 Os Osmium	77 192.22 Ir Iridium	78 195.09 Pt Platinum	79 196.97 Au Gold	80 200.59 Hg Mercury	81 204.37 Tl Thallium	82 207.19 Pb Lead	83 208.98 Bi Bismuth	84 (209) Po Polonium	85 (210) At Astatine	86 (222) Rn Radon	
87 (223) Fr Francium	88 (226) Ra Radium	89 227.03 Ac Actinium	104 (261) Rf Rutherfordium	105 (262) Db Dubnium	106 (266) Sg Seaborgium	107 (262) Bh Bohrium	108 (265) Hs Hassium	109 (266) Mt Meitnerium	110 (271) 	111 (272) 	112 (277) 		114 (285) 		116 (289) 		118 (293) 	



- alkali metals
- alkaline earth metals
- transitional metals
- other metals
- nonmetals
- noble gases

Lanthanide series	58 140.12 Ce Cerium	59 140.91 Pr Praseodymium	60 144.24 Nd Neodymium	61 (145) Pm Promethium	62 150.36 Sm Samarium	63 151.96 Eu Europium	64 157.25 Gd Gadolinium	65 158.93 Tb Terbium	66 162.50 Dy Dysprosium	67 164.93 Ho Holmium	68 167.26 Er Erbium	69 168.93 Tm Thulium	70 173.04 Yb Ytterbium	71 174.97 Lu Lutetium
Actinide series	90 232.04 Th Thorium	91 231.04 Pa Protactinium	92 238.03 U Uranium	93 237.05 Np Neptunium	94 (244) Pu Plutonium	95 (243) Am Americium	96 (247) Cm Curium	97 (247) Bk Berkelium	98 (251) Cf Californium	99 (252) Es Einsteinium	100 (257) Fm Fermium	101 (258) Md Mendelevium	102 (259) No Nobelium	103 (262) Lr Lawrencium



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[https://xdb.lbl.gov/Section1/Periodic Table/X-ray Elements.html](https://xdb.lbl.gov/Section1/Periodic%20Table/X-ray%20Elements.html)

Beamlines

Mid-IR

– organic compounds, bulk and microscopy

X-rays, bulk and microscopy

– Soft X-rays
– SGM, VLS-PGM, SM

Tender X-rays

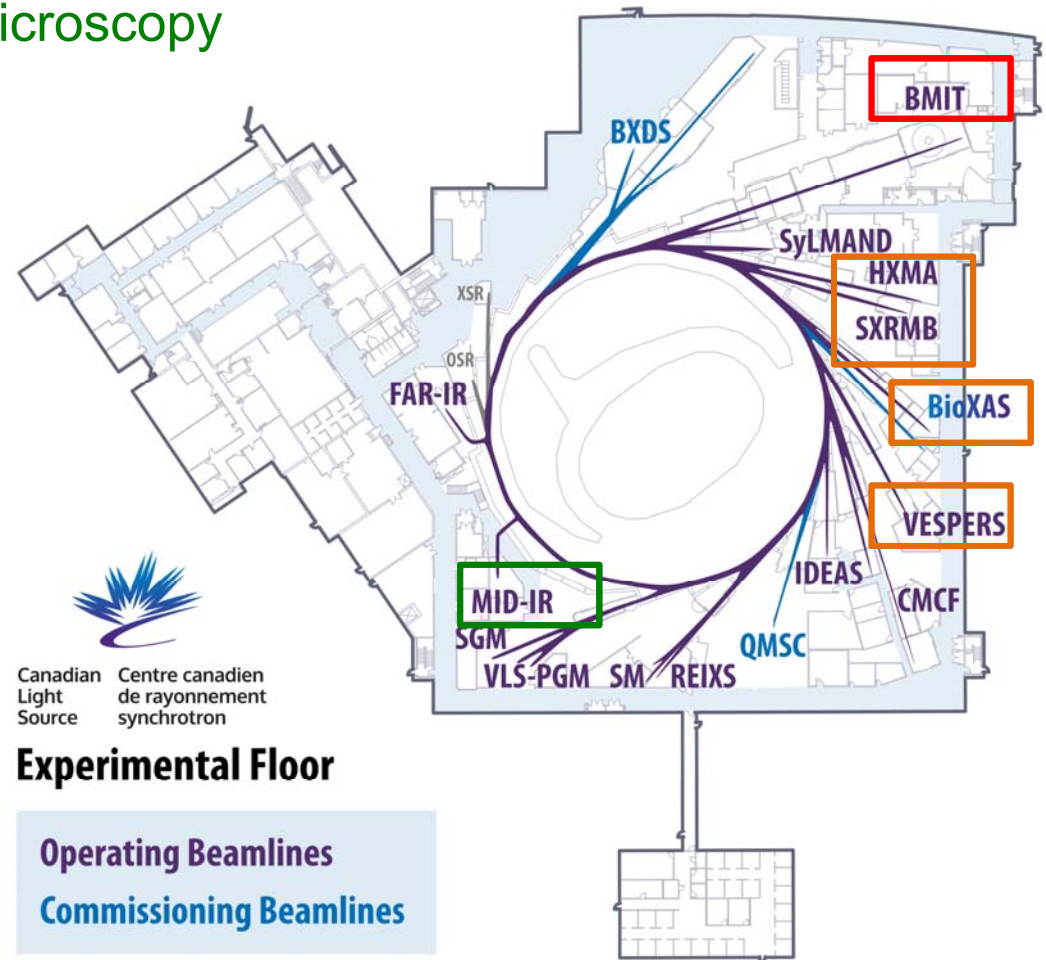
– SXRMB

Hard X-rays

– VESPERS, Bio-XAS, HXMA

X-ray Computed tomography

BMIT (BM or ID)



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<https://www.lightsource.ca/beamlines.html>

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Agriculture Website

coming online....

- Goal: Growing the CLS agriculture community
 - FAQ
 - Example proposals for different beamlines or techniques
 - Proposal templates for different beamtimes with tips
- Forum?
 - Your input and help in growing the community are appreciated – please give constructive comments



Before and after beamtime

- Before beamtime....
 - Keep your samples ready
 - Plan and prioritize your experiments at the CLS according to the experimental objectives
 - Contact CLS staff well in advance if you have questions
- After beamtime
 - Summarize your results within 3-6 months
 - Any reports or publications let CLS staff know and update in the CLS publication database



Watch for....

- Annual users meeting May 23, 2020
 - BMIT and X-ray absorption spectroscopy workshops
- CLS awards
 - Graduate students travel award
 - G. Michael Bancroft PhD Thesis Award



Questions?

What other things we can do for you?



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