



Canadian
Light
Source Centre canadien
de rayonnement
synchrotron

2024 Annual Report

DISCOVERY AT THE SPEED OF LIGHT

lightsource.ca





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Message from the Chair of the Board



This year we've witnessed heightened awareness across Canada and around the world on the vital importance of research and innovation in addressing the global challenges faced by humanity, while recognizing the need for improved security.

To ensure this national infrastructure is maintained and operated efficiently, the Canadian Light Source Board of Directors has focused its oversight activities on engagement with the user community, other national research facilities, as well as funders and government leaders in science, technology, and innovation.

Other areas of importance for the Board this past year have included strengthening existing ecosystem partnerships and seeking out new ones, exploring ways in which artificial intelligence can strengthen CLS operations, and encouraging an increased focus on industrial science and commercialization, as we ensure alignment with national and provincial priorities, to benefit all Canadians.

The CLS continues to enable transformative research and innovation, with state-of-the-art infrastructure and world-leading talent, made possible by the continued support of our funding partners: the Canada Foundation for Innovation, the Natural Sciences and Engineering Research Council, the Canadian Institutes for Health Research, the Province of Saskatchewan, and the University of Saskatchewan.

We will continue to engage with funding stakeholders to ensure the long-term sustainability of our facility as well as other major research infrastructure in Canada. We know that a robust science ecosystem is critical for the country's prosperity, to ensure that Canada remains a competitive player in global innovation and continues to attract and retain the best minds.

On behalf of the entire Board of Directors we extend our gratitude to CLS staff, users, external expert advisory committees, funding partners and stakeholders, for their continued support.

Pierre Lapointe Chair
Board of Directors

Message from the CEO



My first year as CEO has been exhilarating and transformational. It is a privilege and an honour to work with such an exceptional team of people, who work collaboratively to support scientists from across Canada and around the world who conduct research at the CLS.

Recent changes in the composition of our executive team have strengthened our operational

capability and planning focus. We are also welcoming a new Chief Science Officer, Dr. Ingrid Pickering, who will bring her world-renowned expertise to lead the scientific development of CLS.

This year we supported research by over 1,200 scientists from 56 Canadian institutions and 28 countries, culminating in 469 academic publications. The breadth of science – some of it included in this report – is truly inspiring.

In advanced materials, enormous progress is being made to extend the life and storage capacity of batteries, while increasing their sustainability and safety. In health, our users are making advances in combatting antibiotic resistance, developing new vaccines, improving treatments for diseases such as COVID and malaria, and developing better hearing implants. Advances in environmental research include new methods to improve mine waste treatment, recycling precious metals, protecting drinking water, and creating new materials for safer nuclear waste disposal. Finally, in agriculture, CLS users are inventing new plant-based meat substitutes, novel ways to protect crops from climate change, and innovative fertilizers to feed the world's growing population.

As we embark on our exciting project to replace our linear accelerator, which will help us be more efficient and reliable than ever before, we look forward to continuing to support the Canadian scientific community when we come back online in 2025.

Bill Matiko
Chief Executive Officer

VISION

As a valued Canadian voice for innovation, our leadership and world-class talent achieve excellence in light source services and solutions.

MISSION

We enable science, learning, and socio-economic benefits through the provision of synchrotron light.

VALUES

SAFETY: We make safety paramount.

INNOVATION: We expand the boundaries of what is possible.

LEADERSHIP: We are leaders in light source applications, global science, and organizational excellence.

COLLABORATION: We enable collaboration among users, and sectors across academia, industry, and government.

EQUITY, DIVERSITY, AND

INCLUSION: We are committed to equity, diversity, and inclusion.

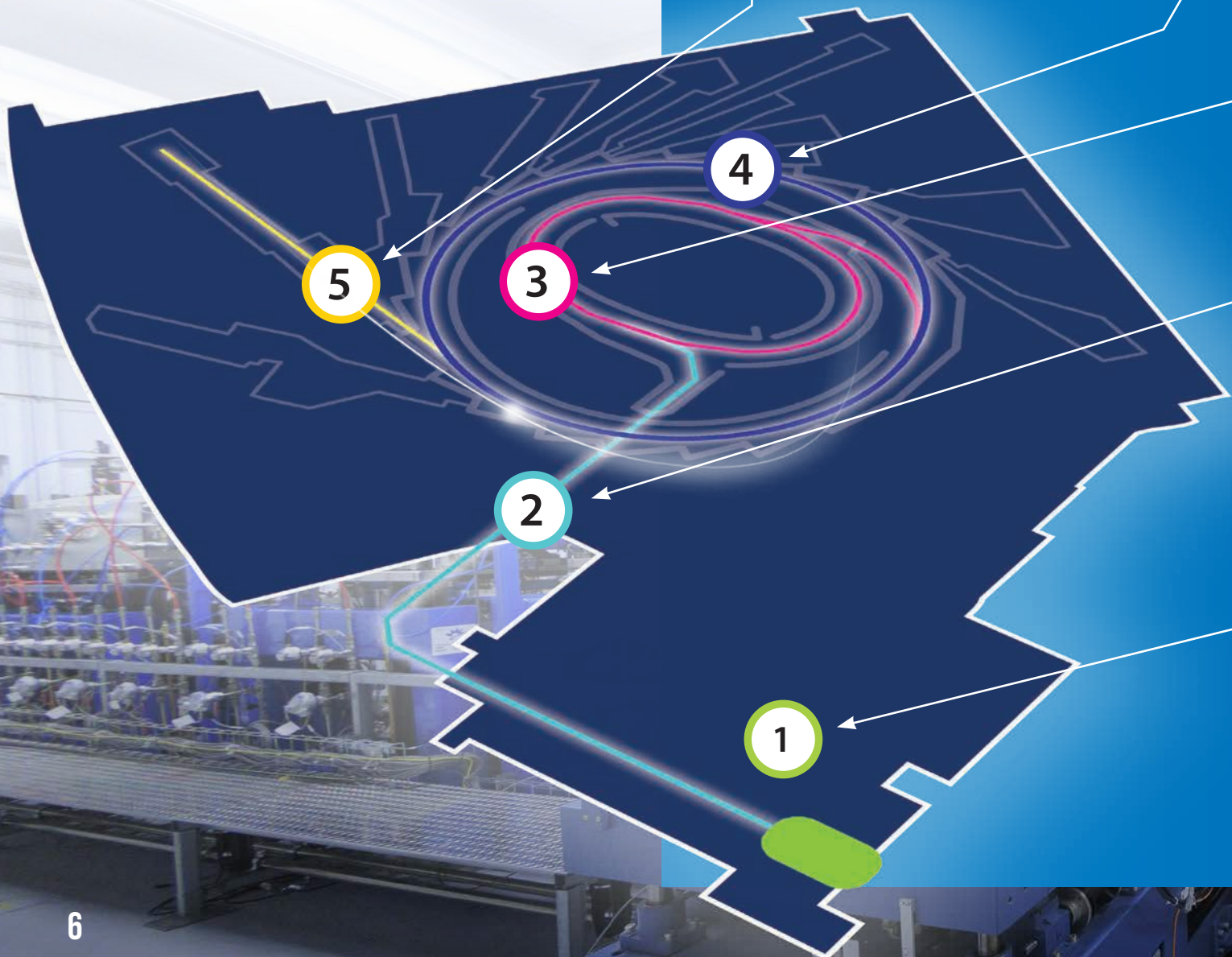
ACCOUNTABILITY: We utilize resources responsibly and hold ourselves to the highest standards of ethics and integrity.

How the light source works



BEAMLINES

Beams of light are directed down the beamlines to experimental stations.





STORAGE RING

Magnets bend the electron beam many times, producing a super bright light.



BOOSTER RING

In the ring, microwaves continue to accelerate the electrons; they travel around the ring 1.5 million times in 0.6 seconds.



LINEAR ACCELERATOR

Microwaves increase the speed of the electrons to 99.9998 per cent of the speed of light.



ELECTRON GUN

Bursts of electrons are injected into an ultra-high-vacuum, stainless-steel tube.



Our Year in Numbers



7,771
SHIFTS
DELIVERED

469

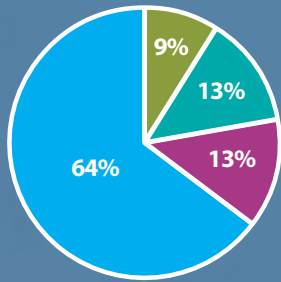


SCIENTIFIC
PUBLICATIONS



269
STAFF

USER DISCIPLINES



Shifts delivered by strategic area

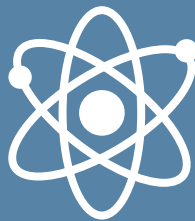
- Materials
- Health
- Environment
- Agriculture



users from
28 countries | **9** provinces

147

INTERNATIONAL COLLABORATIONS



900 BILLION ELECTRONS

CIRCULATING IN THE STORAGE RING

960

GRAD STUDENTS AND POSTDOCTORAL FELLOWS



USERS FROM

56

Canadian Institutions



1.3 Seconds

Electrons in the booster ring travel fast enough to reach the moon in 1.3 seconds



1,251

DISTINCT USERS

Science Highlights

Protecting the health of Canadians

Discovery sets stage for vaccine against gastric cancer, ulcers

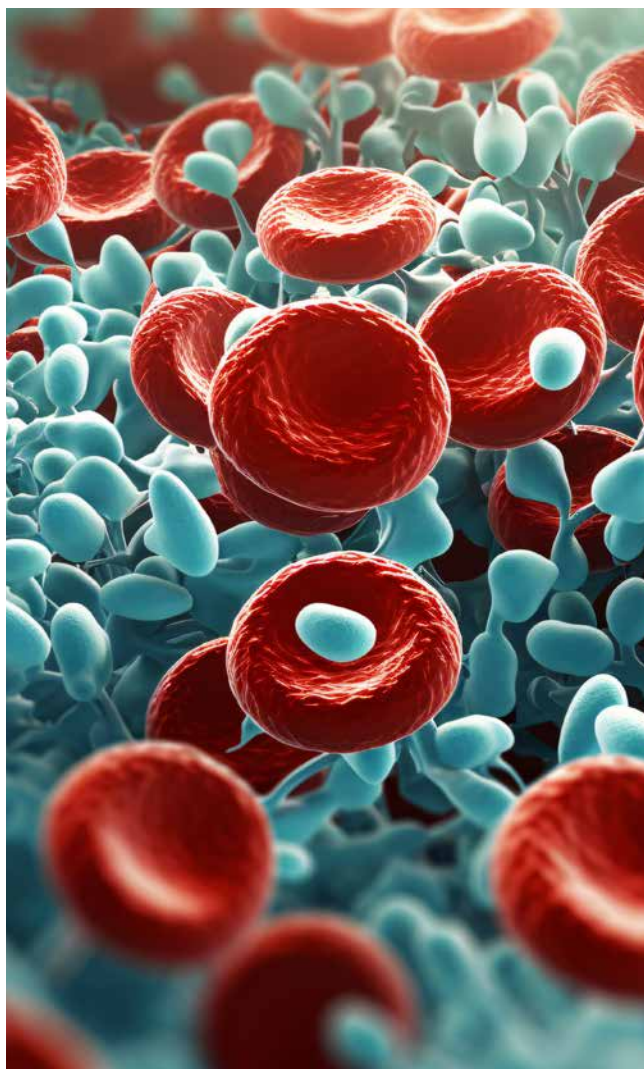
H. pylori is one of the most common disease-causing bacteria. More than half of the world's population have the bacteria in their body. Using the CLS, researchers from Quebec's National Institute of Scientific Research (INRS) have for the first time solved the structure of the protein that plays a key role in helping *H. pylori* stick to the lining of our stomach. It is the bacteria's ability to bind to the inside of the stomach that helps it survive and cause health problems – including gastric cancer and peptic ulcers. This research paves the way for developing a vaccine against the infection. DOI:10.1128/mbio.02952-23

Improving antiviral medication for COVID-19 gives more patients access to treatment

Researchers from the University of Alberta are using the CLS to improve Paxlovid so it can be used by people who are immunocompromised or have other chronic conditions. The COVID antiviral uses a second drug as a metabolic booster to keep the active drug in the blood stream longer. However, this additive can interact with other medications. The team modified a specific area of the molecule in the active drug so it stays in the system – meaning an additional “booster” drug is not necessary. The research group is now working to expand what they learned to design drugs to help fight other viruses. DOI:10.1021/acsbiochemau.3c00039

Undermining the foundations of bacterial resistance

Scientists from the University of Guelph used the CLS to better understand how several infectious bacteria, including *E. coli*, build a protective sugar-based barrier that helps cloak their cells. The study is an early step toward new treatments for *E. coli* and a whole range of bacteria. The researchers are focused on strains of *E. coli* that cause urinary tract and bloodstream infections, particularly those that are antibiotic resistant. They are working to understand the enzyme that many infectious bacteria use to build the foundations of their protective capsule, which helps shield the bacterium from attack by the human immune system. This foundation could serve as a common point of attack, allowing a single treatment for several key pathogens infecting humans and livestock. DOI:10.1016/j.jbc.2023.104609





New hope for fighting malaria: Decoding human antibodies

Using the CLS, researchers from The Hospital for Sick Children (SickKids) decoded how human antibodies protect us from the malaria parasite, which kills more than 600,000 people worldwide annually. The CMCF beamline enabled the team to identify the precise structures involved in identifying and fighting off the disease. They were able to see that protective antibodies lock on to a vulnerable point on the malaria parasite in a specific form, making it easier to neutralize the infection. The results could be used to inform development of better treatments and vaccines. DOI:10.1016/j.celrep.2023.113330

Customized hearing implants: How synchrotron imaging is changing the game

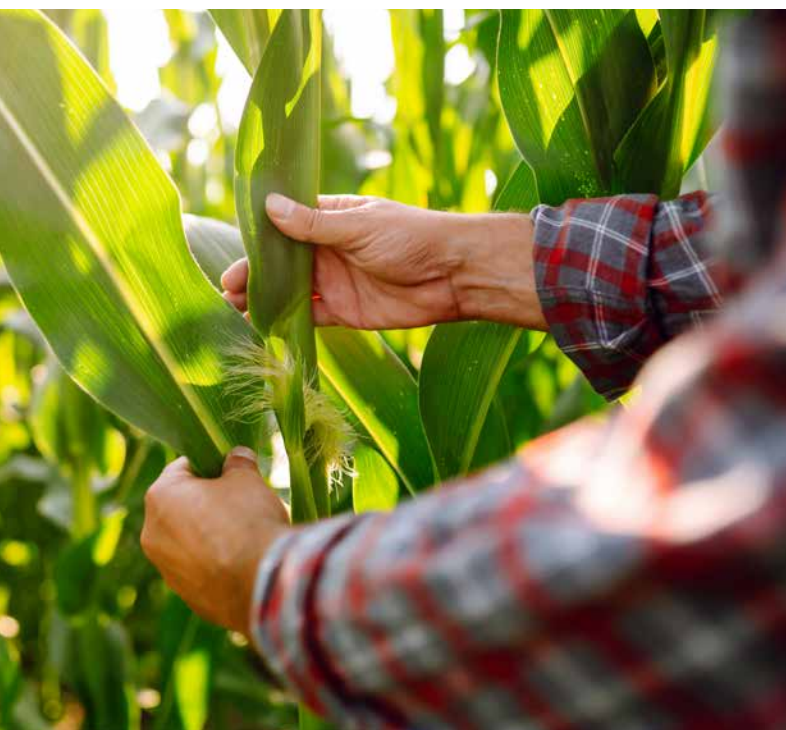
Using the CLS, a team from Western University has obtained highly detailed images of the structures in the inner ear responsible for transmitting sound signals to the brain. With these images, they've helped pioneer customized programming strategies for hearing implants. Because of the cochlea's tiny, delicate, spiral-shaped structure, and the fact that it is encased in the densest bone in the human body, it is hard to use conventional techniques to study its anatomy and how hearing implants interact with it. The maps the team created should make a huge difference to the sound quality of cochlear implants. DOI:10.1002/lary.31263



Advancing Agricultural Research

Corn protein key to better texture in plant-based meat substitutes

Using the CLS, scientists from the University of Guelph and Lakehead University invented a new method for creating meat substitutes with the same fibrous qualities as a steak or chicken breast – but that relies on the existing physical and molecular properties of specific plant proteins and their interactions with one another rather than intensive processing. The key ingredient that provided the structure they were after is zein, the primary storage protein in corn. An abundant waste product in agriculture, zein can be isolated from corn gluten. The scientists found that combining and then “stretching” certain starches and proteins yielded a meat substitute with a texture that closely matches that of cooked chicken and beef. DOI:10.1016/j.ifset.2023.103385



Transforming chicken manure into nutrient-rich fertilizer for crops

An international collaboration between researchers from Brazil and the United States has identified a process for turning poultry waste into a soil additive for agriculture. The scientists heated the poultry manure to convert it to biochar, a carbon-rich substance that is used as a soil additive to replenish critical nutrients like phosphorus. Poultry manure is full of calcium and requires higher temperature treatments to turn the waste into biochar; however, these higher temperatures can have an effect on the amount of phosphorus available. To protect the phosphorus and ensure the resulting biochar contained sufficient phosphorus in a soluble form, the researchers enriched it with another mineral, magnesium. The team used CLS beamlines to visualize the connection between phosphorus and magnesium. While phosphorus reserves are found across the globe, the nutrient is a finite resource. DOI:10.1016/j.chemosphere.2023.138759



Recycling phosphorus from wastewater to grow better crops

Scientists from the University of Idaho are helping close the loop on the sustainability cycle with research into nutrient-enhanced biochar. The team is focused on enhancing biochar – which can be used as an amendment to promote soil health – by adding phosphorus recovered from wastewater. A limited resource typically mined from the soil, phosphorus is a crucial nutrient for crops. Biochar is an effective sponge that can soak up phosphorous and other nutrients, like nitrogen, from waterways.

DOI:10.1371/journal.pwat.0000092

Nature’s defense against a changing climate

Balsam poplars are commonly planted as a wind shelter or for alley cropping, to create lanes for growing agricultural crops. Because of their economic value for these applications, plant breeders are interested in developing new hybrid types that are resistant to drought. Researchers from the University of British Columbia used the CLS to look inside balsam poplar saplings, to learn more about how their water transport system is affected by lack of moisture in soil. They found that while under normal conditions water is transported from the roots to the leaves through a continuous column of water, in drought conditions pockets of air form in that column, blocking the transport of water and nutrients to the leaves and allowing poplars to store water and release it later when most needed.

DOI:10.1111/ppl.14040

New discovery may lead to better vaccines for pork producers

Porcine reproductive and respiratory syndrome virus (PRRSV) causes severe disease in pigs, leading to significant economic losses for pork producers across the globe. It’s estimated that PRRS costs the Canadian pork industry \$130M annually. Using the CMCF beamline, researchers from the University of Manitoba and the Leiden University Medical Centre (Netherlands) were able to see the structure of the PRRSV protease, a type of protein the pathogen uses to suppress a host’s immune system. The vital information they uncovered can be used to develop new vaccines against PRRSV and also helps inform development of vaccines against emerging human viruses.

DOI:10.1371/journal.ppat.1011872



Protecting the Environment

Protecting drinking water on prairies from emerging pollutant

Researchers from the University of Guelph used the CLS to learn more about an emerging pollutant prevalent in groundwater across the Prairies. Sulfolane, which is used to treat sour gas, has recently been linked to fertility issues in cattle and has been found in their milk. The researchers are studying how sulfolane moves in groundwater, to determine the risk it poses to potable waters, such as wells. The Brockhouse and SGM beamlines are enabling the team to see how naturally occurring salts impact the movement of sulfolane in water and its ability to mix thoroughly with water. What they're learning could help inform remediation efforts. DOI:10.1063/5.0196389



Using pulp and paper waste to scrub carbon from emissions

Capturing carbon emissions is one of the most exciting emerging tools to fight climate change. Researchers at McGill University have developed an innovative approach to improve the energy efficiency of carbon conversion, using waste material from pulp and paper production. The technique they've pioneered using the CLS not only reduces the energy required to convert carbon into useful products, but also reduces overall waste in the environment. The team used CLS beamlines to observe chemical reactions in real-time, mimicking industrial processes as closely as possible. They hope to expand the range of products that can be made with CO₂, and help develop a truly green technology. DOI:10.1039/D3SU00379E





New glass-ceramic composite shows promise for safer storage of nuclear waste

Nuclear power holds a lot of potential as a cleaner alternative to fossil fuels. However, safe storage of spent waste has been an ongoing challenge. Using the VLS-PGM beamline at the CLS, University of Saskatchewan researchers discovered that a composite material combining glass and ceramic is as resistant to corrosion as glass alone – currently the industry standard – and is actually able to bind or hold more waste.

The researchers' findings open doors for advancing nuclear power adoption and new reactor types. DOI:10.1016/j.corsci.2024.111831



Recycling precious metals from electronic waste with captured CO₂

Using the CLS, University of Toronto researchers pioneered a method for using captured carbon dioxide to harvest precious metals from electronic waste such as car batteries, wind turbine magnets, and fluorescent bulbs. Recycling electronic waste provides an efficient avenue to gain these vital resources, where they are found at a rate of 20 to 38 per cent. Conventionally mined ores typically only contain 1 to 2 per cent concentrations of rare earth metals. The recycling technique the team has honed involves heating and pressurizing CO₂, transforming it into a supercritical fluid. In this state, it can be used to

dissolve and extract critical metals from

their surroundings. The big advantage of CO₂ is that you don't have to get it very hot to initiate this conversion – only to about 30 degrees Celsius. DOI:10.1021/acs.inorgchem.2c04508

Protecting communities from toxic mine waste

When mine waste is weathered by exposure to water and air, it produces toxins such as arsenic and lead. Using the CLS (and the Advanced Photon Source in Illinois) researchers from the University of Waterloo demonstrated that a multi-layer cover of soil, sand, and

gravel placed over tailings effectively contains those toxins, preventing them from harming nearby water supplies and the environment. The team conducted their experiments using waste deposited on a site near Timmins, Ontario between 1968 and 1972; it was covered in 2008. The results provide useful information for decision makers and engineers as they plan future mine remediation efforts. DOI:10.1016/j.apgeochem.2023.105819



Creating Next Generation Materials



From cannabis harvest to flexible solar panels

Organic electronics are making possible diverse new technologies ranging from sensors for monitoring cannabinoid levels in cannabis plants to lightweight, bendable solar panels. Key to these advances is a class of substances called conductive polymers, which have good optical and mechanical properties but are cheaper to manufacture than conventional electronics. Researchers from the University of Ottawa used the Brockhouse beamline at the CLS to study how different manufacturing processes can affect the performance of the resulting electronic devices. The team was able to examine – at a microscopic level – how the carbon molecules behave during manufacturing. What they're learning will inform how best to produce these new cutting-edge devices. DOI:10.1021/acsami.3c12335



The fascinating future of metal tellurate materials

Identifying the structure of new materials is often the first step to unlocking their potential for applications. A research team involving scientists from Finland and Austria recently determined the structure of a new material that has the potential to be used in solar energy, batteries, and splitting water to produce hydrogen. The international group successfully created a single crystal of a metal tellurate compound, making it possible to precisely define its structure with better accuracy than ever before. The pair used the CLS to understand how the material works under real-world conditions. DOI:10.1039/D3MA01106B





A new approach to longer-lasting, faster-charging batteries

Researchers from McGill University and Université du Québec à Montréal have found a new approach to making inexpensive batteries that can not only hold large amounts of charge but also recharge quickly. They focused on improving lithium ion batteries, rechargeable cells that are used in electric vehicles, power tools, and phones. The research team mixed a known fast-charging material with a high-capacity one, and experimented with different ways to combine them.

Using the CLS enabled them to image the lithium ions – which act as a bottleneck for fast charging – so that they could monitor the battery chemistry while it was being charged. They found that a layered, sandwich-like design worked best. DOI:10.1002/celc.202300279



Findings pave way for longer-lasting solid state batteries

Lithium-ion batteries contain flammable materials that could pose a safety risk under certain conditions. Researchers from the National Research Council of Canada are using the CLS to develop a safer alternative: solid-state batteries. These batteries replace the flammable liquid electrolyte in conventional batteries with a solid ceramic-based material to pass charge through the battery. Solid-state batteries have another advantage: because they can be made with lithium metal, they're able to hold a great deal of charge in a small space, making them powerful energy storage devices. The new insights gained using synchrotron light – which is particularly well suited to studying batteries – will help the researchers improve the mix of solid and liquid parts and how these batteries are put together. DOI:10.1021/acs.jpcc.3c05419

Developing batteries with 10 times the energy storage

To meet the rising global demand for electric vehicles, we need new and improved batteries. One promising candidate is all-solid-state lithium sulfur batteries, which can store nearly 10 times the amount of energy as traditional lithium-ion batteries, according to Western University scientists. This type of rechargeable battery uses sulfur, a more affordable, environmentally friendly, and safer material. The team used the CLS to analyze what happens inside these batteries when they are operating, key information for designing longer-lasting batteries, with higher energy density. DOI:10.1038/s41467-023-42109-5



Financial Statements

CANADIAN LIGHT SOURCE INC.
March 31, 2024

Management's Responsibility

To the Member of Canadian Light Source Inc.:

Management is responsible for the preparation and presentation of the accompanying financial statements, including responsibility for significant accounting judgments and estimates in accordance with Canadian accounting standards for not-for-profit organizations. This responsibility includes selecting appropriate accounting principles and methods, and making decisions affecting the measurement of transactions in which objective judgment is required.

In discharging its responsibilities for the integrity and fairness of the financial statements, management designs and maintains the necessary accounting systems and related internal controls to provide reasonable assurance that transactions are authorized, assets are safeguarded and financial records are properly maintained to provide reliable information for the preparation of financial statements.

The Board of Directors and Finance and Audit Committee are composed entirely of Directors who are neither management nor employees of the Organization. The Board is responsible for overseeing management in the performance of its financial reporting responsibilities, and for approving the financial information. The Finance and Audit Committee has the responsibility of meeting with management and external auditors to discuss the internal controls over the financial reporting process, auditing matters and financial reporting issues. The Finance and Audit Committee is also responsible for recommending the appointment of the Organization's external auditors.

MNP LLP is appointed by the Member to audit the financial statements and report directly to them; their report follows. The external auditors have full and free access to, and meet periodically and separately with, both the Finance and Audit Committee and management to discuss their audit findings.

June 26, 2024



Chief Executive Officer



Director of Finance

To the Member of Canadian Light Source Inc.:

Opinion

We have audited the financial statements of Canadian Light Source Inc. (the "Organization"), which comprise the statement of financial position as at March 31, 2024, and the statements of operations, changes in member's surplus and cash flows for the year then ended, and notes to the financial statements, including a summary of significant accounting policies.

In our opinion, the accompanying financial statements present fairly, in all material respects, the financial position of the Organization as at March 31, 2024, and the results of its operations and its cash flows for the year then ended in accordance with Canadian accounting standards for not-for-profit organizations.

Basis for Opinion

We conducted our audit in accordance with Canadian generally accepted auditing standards. Our responsibilities under those standards are further described in the Auditor's Responsibilities for the Audit of the Financial Statements section of our report. We are independent of the Organization in accordance with the ethical requirements that are relevant to our audit of the financial statements in Canada, and we have fulfilled our other ethical responsibilities in accordance with these requirements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Responsibilities of Management and Those Charged with Governance for the Financial Statements

Management is responsible for the preparation and fair presentation of the financial statements in accordance with Canadian accounting standards for not-for-profit organizations, and for such internal control as management determines is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the financial statements, management is responsible for assessing the Organization's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless management either intends to liquidate the Organization or to cease operations, or has no realistic alternative but to do so.

Those charged with governance are responsible for overseeing the Organization's financial reporting process.

Auditor's Responsibilities for the Audit of the Financial Statements

Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with Canadian generally accepted auditing standards will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these financial statements.

Independent Auditor's Report *(continued from previous page)*

As part of an audit in accordance with Canadian generally accepted auditing standards, we exercise professional judgment and maintain professional skepticism throughout the audit. We also:

- Identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.
- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Organization's internal control.
- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by management.
- Conclude on the appropriateness of management's use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Organization's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditor's report to the related disclosures in the financial statements or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditor's report. However, future events or conditions may cause the Organization to cease to continue as a going concern.
- Evaluate the overall presentation, structure and content of the financial statements, including the disclosures, and whether the financial statements represent the underlying transactions and events in a manner that achieves fair presentation.

We communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.

Saskatoon, Saskatchewan

June 26, 2024

MNP LLP

Chartered Professional Accountants

CANADIAN LIGHT SOURCE INC.
STATEMENT OF FINANCIAL POSITION
as at March 31
(in thousands of dollars)

	2024	2023
CURRENT ASSETS		
Cash	\$ 4,117	\$ 1,170
Accounts receivable (Note 4 and 14)	24,212	8,465
Grants receivable	400	8,335
Prepaid expenses	857	628
Inventory (Note 6)	4,442	4,079
	<u>34,028</u>	<u>22,677</u>
PREFERRED SHARES (Note 5)	-	-
EQUIPMENT AND FACILITY IMPROVEMENTS (Note 7)	42,015	46,731
DECOMMISSIONING FUND (Note 13)	4,845	3,478
INTANGIBLE ASSETS (Note 8)	334	375
	<u>\$ 81,222</u>	<u>\$ 73,261</u>
CURRENT LIABILITIES		
Accounts payable and accrued liabilities (Note 9 and 14)	\$ 5,661	\$ 6,097
Government remittances payable	64	178
Deferred revenue	147	253
Deferred contributions (Note 10)	17,227	3,363
	<u>23,099</u>	<u>9,891</u>
DEFERRED CONTRIBUTIONS RELATED TO EQUIPMENT AND FACILITY IMPROVEMENTS (Note 11)	35,122	37,663
ACCRUED DECOMMISSIONING COSTS (Note 13)	13,540	14,327
	<u>71,761</u>	<u>61,881</u>
COMMITMENTS (Note 17)		
MEMBER'S SURPLUS		
Unrestricted	6,419	8,000
Invested in equipment, facility improvements and intangible assets (Note 15)	3,042	3,380
	<u>9,461</u>	<u>11,380</u>
	<u>\$ 81,222</u>	<u>\$ 73,261</u>

APPROVED BY THE BOARD OF DIRECTORS



..... Chair, Board of Directors



..... Chair, Finance and Audit Committee of the Board of Directors

CANADIAN LIGHT SOURCE INC.
STATEMENT OF OPERATIONS
for the year ended March 31, 2024
(in thousands of dollars)

	<u>2024</u>	<u>2023</u>
REVENUE		
Canada Foundation for Innovation	\$ 23,908	\$ 20,631
Natural Sciences and Engineering Research Council of Canada	4,600	5,600
Canadian Institutes of Health Research	1,400	2,000
University of Saskatchewan	2,299	2,240
Province of Saskatchewan	4,100	4,100
Contracted research fees and other	3,685	3,602
	<u>39,992</u>	<u>38,173</u>
EXPENSES		
Salaries and benefits (Note 3)	26,590	25,770
Repairs and maintenance (Note 6)	3,418	3,356
Supplies and services (Note 14)	6,099	5,198
Bad debt expense	8	8
Utilities (Note 14)	4,303	3,100
Decommissioning costs (Note 13 and 14)	1,171	1,008
	<u>41,589</u>	<u>38,440</u>
OPERATING LOSS	(1,597)	(267)
Recognition of deferred contributions related to equipment and facility improvements (Note 11)	5,187	5,325
Amortization of equipment, facility improvements and intangible assets	<u>(5,509)</u>	<u>(5,701)</u>
NET LOSS BEFORE OTHER ITEMS	(1,919)	(643)
OTHER ITEMS		
Construction loss recovery (Note 12)	<u>-</u>	<u>288</u>
NET LOSS FOR THE YEAR	\$ <u>(1,919)</u>	\$ <u>(355)</u>

CANADIAN LIGHT SOURCE INC.
STATEMENT OF CHANGES IN MEMBER'S SURPLUS
for the year ended March 31, 2024
(in thousands of dollars)

	Unrestricted	Invested in equipment, facility improvements and intangible assets (Note 15)	2024	2023
Balance, beginning of year	\$ 8,000	\$ 3,380	\$ 11,380	\$ 11,735
Net loss	(1,597)	(322)	(1,919)	(355)
Investment in equipment and facility improvements	16	(16)	-	-
Balance, end of year	<u>\$ 6,419</u>	<u>\$ 3,042</u>	<u>\$ 9,461</u>	<u>\$ 11,380</u>

CANADIAN LIGHT SOURCE INC.
STATEMENT OF CASH FLOWS
for the year ended March 31, 2024
(in thousands of dollars)

	2024	2023
OPERATING ACTIVITIES		
Net loss	\$ (1,919)	\$ (355)
Recognition of deferred contributions related to equipment and facility improvements	(5,187)	(5,325)
Amortization of equipment and facility improvements	5,509	5,701
Construction loss recovery (Note 12)	-	(288)
Accrued decommissioning costs	1,091	929
	<u>(506)</u>	<u>662</u>
Changes in non-cash working capital		
Accounts receivable	(15,747)	8,151
Grants receivable	7,935	(6,251)
Prepaid expenses	(229)	82
Inventory	(363)	7
Accounts payable and accrued liabilities	(436)	1,170
Government remittances payable	(114)	149
Deferred revenue	(106)	(1,668)
Deferred contributions	13,864	(25)
	<u>4,298</u>	<u>2,277</u>
INVESTING ACTIVITIES		
Acquisition of equipment and facility improvements	(2,632)	(4,754)
Investment in decommissioning fund	(1,367)	(1,083)
	<u>(3,999)</u>	<u>(5,837)</u>
FINANCING ACTIVITIES		
Restricted contributions used to purchase equipment and facility improvements	2,648	4,730
INCREASE IN CASH POSITION	2,947	1,170
CASH POSITION, BEGINNING OF THE YEAR	1,170	-
CASH POSITION, END OF THE YEAR	\$ 4,117	\$ 1,170

CANADIAN LIGHT SOURCE INC.
NOTES TO THE FINANCIAL STATEMENTS
year ended March 31
(in thousands of dollars)

1. NATURE OF THE ORGANIZATION

Canadian Light Source Inc. (the “Organization”) was incorporated under the Non-Profit Corporations Act of Saskatchewan on May 14, 1999 with its sole member being the University of Saskatchewan (“USask”).

USask has constructed and licensed its third generation synchrotron light facility (the “facility”) to the Organization, which is responsible for the operation and conduct of all activities related to the facility, including the design, installation, and maintenance of all beamlines and related equipment.

The mandate of the Organization is to advance scientific and industrial capabilities in synchrotron science and techniques.

2. SIGNIFICANT ACCOUNTING POLICIES

These financial statements have been prepared in accordance with Accounting Standards for Not-for-Profit Organizations (“ASNPO”) and reflect the following significant accounting policies:

Revenue Recognition

The Organization follows the deferral method of accounting for contributions. Contributions from the Canada Foundation for Innovation, Natural Sciences and Engineering Research Council of Canada, and Canadian Institutes of Health Research, and other restricted grants are recognized as revenue in the year in which the related expenses are incurred. Contributions received in excess of expenses incurred are recorded as deferred contributions.

Contributions from USask, the Province of Saskatchewan and other unrestricted contributions are recognized as revenue in the period in which they are received or receivable if the amount to be received can be reasonably estimated and collection is reasonably assured.

Contracted research fees and contractor revenue are recorded as services are rendered. Advances related to construction of additional beamlines and technical equipment in excess of expenses are recorded as deferred revenue. Losses on contracts are recognized as soon as the amount can be reasonably estimated.

CANADIAN LIGHT SOURCE INC.
NOTES TO THE FINANCIAL STATEMENTS
year ended March 31
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2. SIGNIFICANT ACCOUNTING POLICIES (continued)

Deferred Contributions Related to Equipment and Facility Improvements

Deferred contributions related to equipment and facility improvements represent the unamortized portion of restricted contributions that were used to purchase the Organization's equipment and facility enhancements. Recognition of these amounts as revenue is deferred to periods when the related capital assets are amortized.

Cash

Cash includes balances held with banks.

Inventory

Inventory is valued at the lower of cost and net realizable value. Cost is determined using the first in, first out method.

Equipment, Facility Improvements and Intangible Assets

Equipment and facility improvements are recorded at cost. Assets, with the exception of asset retirement obligations and intangible assets, are amortized over their expected useful life using the declining balance method at the following rates:

Equipment and furnishings	20%
Computer equipment and software	30%
Facility improvements	10%
Building under capital lease	10%

Assets are amortized at one half of the above rates in the year of acquisition.

Asset retirement obligations are amortized on a straight-line basis over the expected remaining operating life of the facility. Intangible assets are amortized on a straight-line basis over the expected useful life to the Organization.

Assets under development are not amortized until they are available for use.

The Organization writes down long lived assets held for use when conditions indicate that the asset no longer contributes to the Organization's ability to provide goods and services. The asset is also written down when the value of future economic benefits or service potential associated with the asset is less than its net carrying amount. When the Organization determines that a long lived asset is impaired, its carrying amount is written down to the asset's fair value.

CANADIAN LIGHT SOURCE INC.
NOTES TO THE FINANCIAL STATEMENTS
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2. SIGNIFICANT ACCOUNTING POLICIES (continued)

Decommissioning Costs

The Organization is required to decommission the facility when operations cease in accordance with its Particle Accelerator Operating License issued by the Canadian Nuclear Safety Commission (“CNSC”). The Organization expects the facility to operate for a 30 year period from commencement of operations.

Change in Estimate

Effective during the year ended March 31, 2024, the Organization decreased its accrued decommissioning costs to \$13,540 to reflect changes to the inflation rate, interest rate and expected useful life of the facility. This change was applied prospectively and prior year results have not been restated. For the year ended March 31, 2024, equipment and facility improvements decreased by \$1,205 with a corresponding decrease to accrued decommissioning costs.

Financial Instruments

The Organization recognizes financial instruments when the Organization becomes party to the contractual provisions of the financial instrument.

Arm's Length Financial Instruments

Financial instruments originated/acquired or issued/assumed in an arm’s length transaction (“arm’s length financial instruments”) are initially recorded at their fair value.

At initial recognition, the Organization may irrevocably elect to subsequently measure any arm’s length financial instrument at fair value. The Organization has not made such an election during the year.

The Organization subsequently measures all arm's length financial assets and liabilities at amortized cost.

Transaction costs and financing fees are added to the carrying amount for those financial instruments subsequently measured at cost or amortized cost.

Related Party Financial Instruments

The Organization has no related party financial instruments required to be recognized at fair value.

CANADIAN LIGHT SOURCE INC.
NOTES TO THE FINANCIAL STATEMENTS
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2. SIGNIFICANT ACCOUNTING POLICIES (continued)

All other related party financial instruments are measured at cost on initial recognition. When the financial instrument has repayment terms, cost is determined using the undiscounted cash flows, excluding interest, dividend, variable and contingent payments, less any impairment losses previously recognized by the transferor. When the financial instrument does not have repayment terms, but the consideration transferred has repayment terms, cost is determined based on the repayment terms of the consideration transferred. When the financial instrument and the consideration transferred both do not have repayment terms, the cost is equal to the carrying or exchange amount of the consideration transferred or received.

The Organization subsequently measures all related party financial instruments using the cost method less any reduction for impairment.

Transaction costs and financing fees directly attributable to the origination, acquisition, issuance or assumption of related party financial instruments are immediately recognized in net loss.

Financial Asset Impairment

The Organization assesses impairment of all its financial assets measured at cost or amortized cost. The Organization groups assets for impairment testing when there are numerous assets affected by the same factors. Management considers whether the issuer is having significant financial difficulty; or whether there has been a breach in contract, such as a default or delinquency in interest or principal payments in determining whether objective evidence of impairment exists. When there is an indication of impairment, the Organization determines whether it has resulted in a significant adverse change in the expected timing or amount of future cash flows during the year.

The Organization reduces the carrying amount of any impaired financial assets to the highest of: the present value of cash flows expected to be generated by holding the assets; the amount that could be realized by selling the assets at the statement of financial position date; and the amount expected to be realized by exercising any rights to collateral held against those assets.

Any impairment, which is not considered temporary, is included in current year net loss.

The Organization reverses impairment losses on financial assets when there is a decrease in impairment and the decrease can be objectively related to an event occurring after the impairment loss was recognized. The amount of the reversal is recognized in net loss in the year the reversal occurs.

CANADIAN LIGHT SOURCE INC.
NOTES TO THE FINANCIAL STATEMENTS
year ended March 31
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2. SIGNIFICANT ACCOUNTING POLICIES (continued)

Income Taxes

The Organization is a non-profit entity and is exempt from income taxes.

Defined Contribution Pension Plan

The Organization has a defined contribution pension plan that is offered to permanent employees and employees with a 2 year term or greater. The Organization matches employee contributions.

Foreign Currency Translation

Monetary assets and liabilities denominated in foreign currencies are translated into CAD using the exchange rate in effect at year end. Other assets and liabilities are translated at the prevailing historical rates at the time of the transaction. Expenses arising from foreign currency transactions are translated at the exchange rates in effect on the transaction date. Unrealized exchange gains and losses are included in the determination of net earnings or loss for the year. The Organization does not enter into any derivative contracts to hedge its exposure to changes in foreign currency exchange rates.

Use of Estimates

The preparation of the financial statements in conformity with ASNPO requires management to make estimates and assumptions that affect reported amounts of assets, liabilities and disclosures of contingent liabilities at the date of the financial statements and the reported amounts of revenues and expenses during the year.

Significant financial statement items that require estimates include the collectability of accounts receivable, the impairment of preferred shares, the useful life, discount rates and future costs associated with the asset retirement obligation, the estimate of project overrun costs on contracts, the useful life and potential impairment of equipment, facility improvements and intangible assets and potential contingencies. Actual results could differ from those estimates.

3. DEFINED CONTRIBUTION PENSION PLAN

Total pension contributions made by the Organization in the year totaled \$1,511 (2023 – \$1,463) and are included in salaries and benefits in the Statement of Operations.

CANADIAN LIGHT SOURCE INC.
NOTES TO THE FINANCIAL STATEMENTS
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4. ACCOUNTS RECEIVABLE

	<u>2024</u>	<u>2023</u>
Cash held by USask (Note 14)	\$ 22,368	\$ 5,690
Trade accounts receivable	1,457	743
Construction revenue receivable	1	1,961
Other	473	149
Allowance for doubtful accounts	(87)	(78)
	<u>\$ 24,212</u>	<u>\$ 8,465</u>

5. PREFERRED SHARES

The Organization had a loan agreement to finance Canadian Isotope Innovations Corporation (“CIIC”) for a total amount of \$5,260 at March 31, 2020. At March 31, 2020, the Organization had determined that there was an uncertainty regarding the collectability of the amounts advanced due to start up delays in the project and therefore recognized a full impairment of the loan receivable.

On April 30, 2020, the Organization exchanged the loan receivable and account receivable from CIIC for preferred shares from CIIC with a face value of \$6,321. The shares are redeemable by CIIC, are retractable by the Organization after December 31, 2024 and are non-voting. The shares bear a cumulative dividend at a rate equal to the lesser of the average prime rate plus 0.5% and 7.0% which commenced January 1, 2024. The shares have been recorded at a fair market value of \$ nil (2023 – \$ nil). CIIC is currently in bankruptcy and a trustee of the estate has been appointed. The date of the bankruptcy filing was March 26, 2024.

6. INVENTORY

The Organization holds spare parts in stock at year end. The Organization recognized \$308 (2023 – \$349) of inventories as expense during the year.

CANADIAN LIGHT SOURCE INC.
NOTES TO THE FINANCIAL STATEMENTS
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7. EQUIPMENT AND FACILITY IMPROVEMENTS

	<u>Cost</u>	<u>Accumulated Amortization</u>	<u>Net Book Value</u>	
			2024	2023
Equipment and furnishings	\$ 13,213	\$ 10,186	\$ 3,027	\$ 3,887
Computer equipment and software	21,450	16,176	5,274	6,511
Facility improvements	62,180	37,752	24,428	26,405
Asset retirement obligations	9,714	5,529	4,185	6,063
Development in progress	5,101	-	5,101	3,865
	<u>\$ 111,658</u>	<u>\$ 69,643</u>	<u>\$ 42,015</u>	<u>\$ 46,731</u>

Equipment and facility improvements include supplier in-kind contributions of \$3 (2023 – \$1,035).

8. INTANGIBLE ASSETS

	<u>Cost</u>	<u>Accumulated Amortization</u>	<u>Net Book Value</u>	
			2024	2023
Intellectual property	\$ <u>639</u>	\$ <u>305</u>	\$ <u>334</u>	\$ <u>375</u>

9. ACCOUNTS PAYABLE AND ACCRUED LIABILITIES

	<u>2024</u>	<u>2023</u>
Trade accounts payable	\$ 1,910	\$ 2,388
Accrued loss on construction	327	332
Accrued vacation payable	2,366	2,175
Other accrued liabilities	1,058	1,202
	<u>\$ 5,661</u>	<u>\$ 6,097</u>

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10. DEFERRED CONTRIBUTIONS

	<u>2024</u>	<u>2023</u>
Beginning of year	\$ 3,363	\$ 3,388
Contributions received / receivable in year	46,456	33,996
Recognized as revenue	(29,941)	(27,617)
Contributions used for purchase of equipment and facility improvements	(2,651)	(6,404)
End of year	<u>\$ 17,227</u>	<u>\$ 3,363</u>

11. DEFERRED CONTRIBUTIONS RELATED TO EQUIPMENT AND FACILITY IMPROVEMENTS

	<u>2024</u>	<u>2023</u>
Beginning of year	\$ 37,663	\$ 36,584
Contributions for purchase of equipment and facility improvements	2,651	6,404
Disposals in the year	(5)	-
Recognized as revenue	(5,187)	(5,325)
End of year	<u>\$ 35,122</u>	<u>\$ 37,663</u>

12. CONTRACTOR REVENUE

The Organization is party to an agreement to design and construct additional beamlines for the facility (Note 14). The Organization has recorded contractor revenues of \$3,486 (2023 – \$6,179) net of costs of the same amount.

During the year, the Organization recovered previously recognized expected losses related to active construction contracts of \$ nil (2023 – \$288) due to the completion of the construction projects below the previously estimated losses and revised estimates for active projects.

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NOTES TO THE FINANCIAL STATEMENTS
year ended March 31
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13. ACCRUED DECOMMISSIONING COSTS

The Organization anticipates the undiscounted future cash flows required to decommission the facility to be \$18,989 (2023 – \$18,555). The present value of the asset retirement obligation and the liability for decommissioning costs has been calculated using a credit-adjusted risk free interest rate of 3.4% (2023 – 2.9%) and an inflation rate estimate of 3.3% (2023 – 4.0%) and an estimated facility life of 30 years (2023 – 28 years). The change in these estimates resulted in a decrease of \$1,205 to both the accrued decommissioning costs and the asset retirement obligations. The current year decommissioning costs of \$1,171 (2023 – \$1,008) include amortization of asset retirement obligations of \$674 (2023 – \$642) and costs associated with a financial guarantee to the CNSC of \$79 (2023 – \$79). The financial guarantee is in the amount of \$10,549 (2023 – \$10,549).

During the year, the Organization set aside funds for the purpose of funding the decommissioning liability of \$1,000 (2023 – \$1,000). At the end of the year, the balance of these funds is \$4,845 (2023 – \$3,478), which includes interest earned on the funds.

A reconciliation of the accrued decommissioning costs is as follows:

	<u>2024</u>	<u>2023</u>
Beginning of year	\$ 14,327	\$ 11,830
Accretion expense	418	287
Adjustment due to change in cost estimate	<u>(1,205)</u>	<u>2,210</u>
End of year	<u>\$ 13,540</u>	<u>\$ 14,327</u>

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14. RELATED PARTY TRANSACTIONS

The Organization has recorded contractor revenues for construction of beamlines for USask of \$3,486 (2023 - \$6,179) net of costs of the same amount.

Under the terms of a License Agreement with USask, whereby the Organization has assumed responsibility for the operation, maintenance and enhancement of the facility, the Organization is committed to pay a license fee and utility costs. During the year, the amount of the license fee expensed by the Organization was \$100 (2023 - \$100) which has been included in supplies and services. During the year, the amount of utility costs were \$4,300 (2023 – \$3,100) which has been included in utilities expense.

During the year, the Organization purchased goods and services from USask in the amount of \$898 (2023 – \$1, 204).

The financial guarantee to the CNSC for the decommissioning of the facility of \$10,549 (2023 – \$10,549) was obtained by USask on behalf of CLSI. The costs associated with the financial guarantee of \$79 (2023 – \$79) have been paid by CLSI and has been included in decommissioning costs.

All funds received by the Organization flow through, and certain payments to vendors of the Organization are made from, bank accounts administered by USask. At the end of the year, the amounts due from/(to) USask which are included in accounts receivable and accounts payable are as follows:

	<u>2024</u>	<u>2023</u>
Due from - cash on hand	\$ 22,368	\$ 5,690
Due from - grant funds received and not advanced	-	1,438
Due from - goods and services provided	817	233
Due (to) from - beamline construction	(131)	1,727
Due to - goods and services purchased	(5)	(185)

Routine operating transactions with USask are settled at prevailing market prices under normal trade terms.

These transactions are in the normal course of operations and are measured at the exchange amount, which is the amount of consideration established and agreed to by the related parties.

CANADIAN LIGHT SOURCE INC.
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15. MEMBER'S SURPLUS INVESTED IN EQUIPMENT, FACILITY IMPROVEMENTS AND INTANGIBLE ASSETS

As indicated in the Statement of Changes in Member's Surplus, the Organization has made significant investments in equipment, facility improvements and intangible assets. These represent strategic investments by the Organization that cannot be funded from specific grants. These investments have been approved by the Board of Directors. The investments (net of amortization) in equipment, facility improvements and intangible assets are as follows:

	<u>2024</u>	<u>2023</u>
Facility improvements - beamlines	\$ 1,232	\$ 1,368
Facility improvements - medical isotope technology	565	629
Intangible asset - intellectual property	334	375
Facility improvements - office expansion	617	686
Other	<u>294</u>	<u>322</u>
Member's surplus invested in equipment, facility improvements and intangible assets	<u>\$ 3,042</u>	<u>\$ 3,380</u>

16. FINANCIAL INSTRUMENTS

The Organization is exposed to various risks through its financial instruments. The following analysis presents the Organization's exposures to risks at the reporting date.

Credit risk

The Organization is exposed to credit risk with respect to accounts receivable, grants receivable, decommissioning fund, and preferred shares. Credit risk is the risk that one party to a financial instrument will cause a financial loss for the other party by failing to discharge an obligation. The Organization assesses credit risk on a continuous basis and to mitigate this risk, it maintains an allowance for doubtful accounts and has recognized a full impairment of preferred shares.

Currency risk

Currency risk is the risk that the fair value or future cash flows of a financial instrument will fluctuate because of changes in foreign exchange rates.

The Organization does not actively manage this risk.

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16. FINANCIAL INSTRUMENTS (continued)

The accounts payable and accrued liabilities includes the following amounts expressed in CAD with respect to financial liabilities for which cash flows are denominated in foreign currencies:

	<u>2024</u>	<u>2023</u>
Accounts payable - USD	\$ 158	\$ 244
Accounts payable - BP	39	-
Accounts payable - CHF	4	757
Accounts payable - SEK	3	-
Accounts payable - AUD	-	20
Accounts payable - Euro	184	32
	<u>\$ 388</u>	<u>\$ 1,053</u>

Liquidity risk

Liquidity risk is the risk that the Organization will not be able to meet the obligations associated with its financial liabilities. The Organization is exposed to this risk mainly in respect to its accounts payable and accrued liabilities and accrued decommissioning costs. To manage this risk, the Organization generates cash flows from operations which is monitored on a continuous basis.

17. COMMITMENTS

At the end of the year, the Organization had future commitments of \$1,720 (2023 – \$1,503).

	<u>2024</u>	<u>2023</u>
Salaries and benefits	\$ 335	\$ 178
Supplies and services	426	241
Maintenance	675	571
Equipment and facility improvements	284	513
	<u>\$ 1,720</u>	<u>\$ 1,503</u>

Thank You

Thank you to our government, academic and corporate funding partners for their investment in Canadian science and discovery.

OPERATING



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The Canadian Light Source is a national research facility of the University of Saskatchewan.



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