# CANADIAN LIGHT SOURCE INC.

www.lightsource.ca



Canadian Centre canadien Light de rayonnement Source synchrotron

THE BRIGHTEST LIGHT IN CANADA™

#### **MESSAGE FROM THE CHAIR OF THE BOARD**

First let me express my hope that our users, partners and staff and their families are physically distancing, and remain healthy in these days of COVID-19, and that those who may have caught or will catch the disease will fully recover.

This year was a resounding success for the CLS until the global

pandemic stopped us, and most of the world, in our tracks. Users had access to the newest beamlines and were carrying out leading edge research. Hundreds of highly qualified personnel added advanced techniques to their skillset. Revenue from the industrial program was at a record-high, with over 50 projects that engaged with Canadian sectors in pharmaceuticals, forestry, agriculture, materials and the environment. The Canada Foundation for Innovation international panel report highlighted the many achievements made by the CLS over the past three years, and planning for CLS 2.0 was also accelerating. Despite the successful transition made by all CLS staff to working from home when

the state of emergency was declared in Saskatchewan, the impact of the pandemic will undoubtedly slow future progress in several areas.

In particular, we were about to convene a blue-ribbon Cabinet to oversee the preparation of a national case for a fourthgeneration light source for Canada and proactively engage, on behalf of the whole user community, federal and provincial government officials towards securing its approval. This important initiative will be delayed, but efforts will resume as soon as it is possible to do so. In September we celebrated 20 years since our groundbreaking in 1999. From the discovery of an enzyme able to turn any blood into a universal donor type, to a process that creates plastic from sunshine and pollution, to identifying heat-tolerance traits in pea varieties, scientific advances achieved at the CLS were commemorated.

> We welcomed two outstanding leaders to our executive team, Dr. Gianluigi Botton, who became our new Science Director in May, and Bill Matiko, our new Chief Financial Officer, who joined us in April. Bill and Gianluigi's extensive experience and expertise in their respective fields have been evident in how they quickly adapted to CLS and its processes, people and culture. I am confident that they will successfully lead CLS for many years to come.

Finally, in Canada and elsewhere the current crisis is demonstrating the critical role science can and must play in society. Past investments in discovery research and training in all areas are paying off, as solutions are now found from a deep

understanding of cell biology and chemistry, advances in mathematical modeling, artificial intelligence and engineering, to name but a few. In that context, CLS 2.0 promises to be a unifying and forward-looking initiative for the research community that will greatly benefit Canadians.

**Isabelle Blain,** Chair, Board of Directors

#### νιςιον

Delivering innovative solutions as a leading centre for research excellence in health, agriculture, environment, and advanced materials.

Cover: A computed tomography scan of canola seeds in the middle of germination taken at our BMIT beamline. The emerging plants can be seen breaking through the shells of the seeds to search for water and nutrients.



#### **MESSAGE FROM THE CEO**

This has been a very successful year with a number of records. User proposals for the first half of 2020 is at 426 applications, the highest number in the history of the CLS. This was accompanied by a 32% improvement in the efficiency of ring operations. This is the first major improvement in CLS ring performance since becoming operational in 2003 and a

marked change from the previous year where the CLS was down for 6 months due to a faulty electron source.

Over 400 scientific publications were generated, and 1,172 users – over half of them graduate students – from 148 institutions and 16 countries collected data from CLS facilities. All of this was coordinated through user management software which became fully implemented this year and was developed in-house by our Systems Technology group.

The focus on four key research areas was highlighted by the newest addition, agriculture research, which reached 18% of all beamtime

applications for the most recent round. CLS leadership in this area led to the world's first Pan-American Light Sources for Agriculture (PALSA 2019) conference, which was held in Saskatoon in July 2019, with more than 100 attendees from six countries. Organized in partnership with light sources in Brazil (Sirius) and the USA (Cornell University-CHESS facility), PALSA will now become a biannual meeting, with the next due to take place in Brazil in 2021.



Planning for CLS 2.0 continues, with a conceptual design report under development, along with workshops to gather expert users from each sector, including a national energy materials workshop and the 2nd Canada-Italy meeting to cooperate on 4th generation facility design.

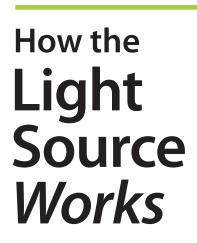
> Safety continues to be the most important priority right along with science. This year, CLS implemented a new Safety Reporting System that makes reporting and tracking easier. It's one of the many safety tools that has allowed us to achieve 1,100 days without a lost time injury. Safety was certainly the priority when CLS closed in mid-March due to the COVID-19 state of emergency. A small essential services team is keeping CLS on warm standby. In conjunction with our stakeholders, CLS is working towards a restart, initially with a focus on COVID-19 research.

Lastly, we are grateful for the

continued support of our federal and provincial funding partners, the Canada Foundation for Innovation (CFI), the Natural Sciences and Engineering Research Council (NSERC), the National Research Council (NRC), the Canadian Institutes of Health Research (CIHR), the Government of Saskatchewan, and the University of Saskatchewan, whose combined efforts ensure Canadian scientists continue to have access to the most advanced and competitive scientific research tools.

Dr. Robert Lamb Chief Executive Officer







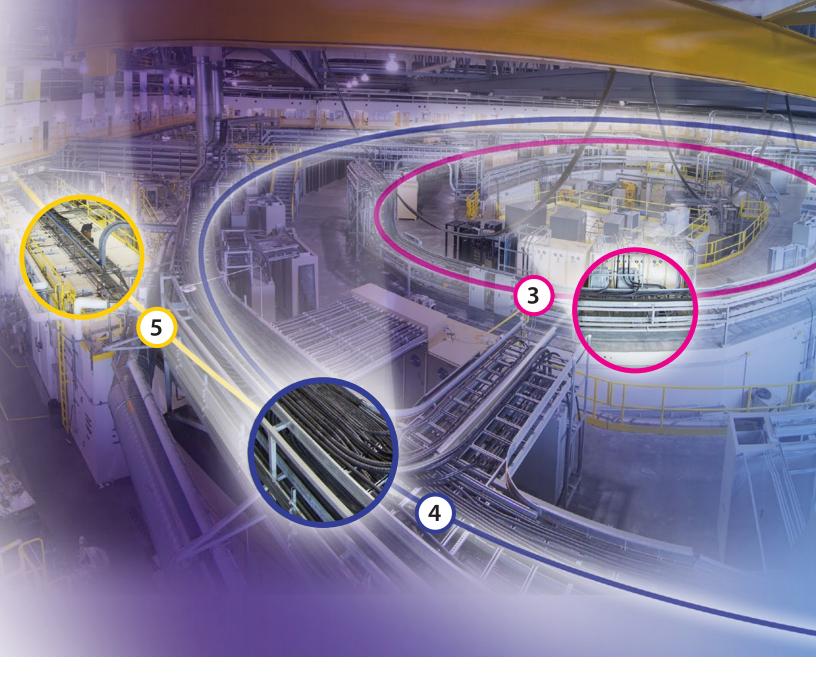
**ELECTRON GUN** Bursts of electrons are injected into a ultra-high

vacuum stainless steel tube.

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



4 STORAGE RING Magnets bend the electron

beam many times, producing a super bright light.





BEAMLINES

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

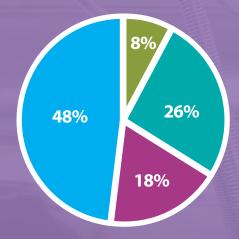
# OUR YEAR IN NUMBERS







SHIFTS DELIVERED BY STRATEGIC AREA

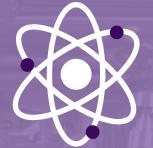


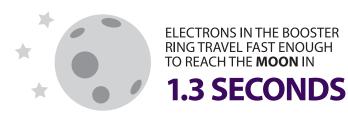
Agriculture
Environment
Health
Materials



**900 BILLION** 

ELECTRONS CIRCULATING IN THE STORAGE RING









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OUR LIGHT IS MILLIONS OF TIMES BRIGHTER THAN THE SUN





### **NEWS HIGHLIGHTS**

### **CANADIAN LIGHT SOURCE OPENS NATIONAL TREE RESEARCH PROJECT TO STUDENTS**

- Saskatoon StarPhoenix, Jan. 8, 2020

U of S research could make greenhouses in the far north a possibility

- CBC News, Jan. 20, 2020

### U of S researchers play role in mapping durum wheat genome

- Global News, April 8, 2019

In search of the perfect loaf: U of M Researchers hone science behind healthier bread that tastes good

- CBC News, Feb. 17, 2020

U of S team seeks to understand how asphalt behaves as temperature changes

- CTV News, Jan. 22, 2020

### Researchers find formula to reduce sodium in bread

- Global News, Feb. 17, 2020

### U of S researchers paving the way for smoother Saskatchewan roads

- CBC News, Jan. 23, 2020

U of S research team shedding light on potential new Alzheimer's drug

- Global News, Jan. 26, 2020

### Editorial: CLS lights the way

- Saskatoon StarPhoenix, Oct. 4, 2019 Better oil additives could prolong life of your vehicle engine: study

- CBC News, May 21, 2019

USask research identifies potential cause of Minamata mercury poisoning - Yorkton This Week, Feb. 15, 2020

# How scientists in Saskatoon are fighting COVID-19

- CTV News, March 19, 2020

Dinosaur discovery "A dream come true" for U of R Physics Professor

- CBC News, Dec. 12, 2019

### Young Innovators: Untangling Clubroot disease

- Global News, July 24, 2018

### Need a phone charger? Maybe not too often, thanks to Western University, 3M researchers

- The London Free Press, Nov. 24, 2019

### Canadian Light Source shines a light on new cancer-fighting drug

- CTV News, July 8, 2019

### Cycling rice and shrimp farming in Vietnam important for food security

- Yorkton This Week, March 8, 2020











### **Preventing heart attacks**

A collaboration between McGill, SickKids Toronto and Université de Montréal used a simplified laboratory model to look at arterial calcification – a major contributor to heart attacks and strokes. The team's goals are to understand the mineralization process and to test drugs that may be able to prevent it. The researchers used the CLS to investigate how the minerals form in arteries, cause blockages and decrease the elasticity needed for blood flow. The model the team used allows them to mimic how the process occurs inside the body and to shed light on therapeutics that could inhibit it. DOI:10.1021/acs.biomac.9b00417



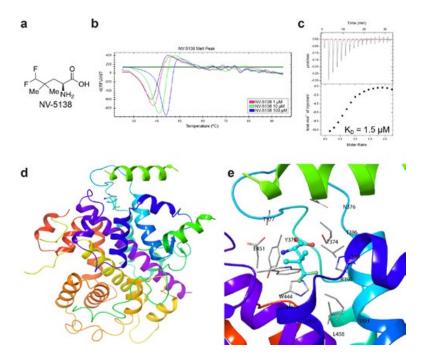
### Scientist make breakthrough in creating universal blood type

A breakthrough in converting all blood types to O-type was made by University of British Columbia researchers using our CMCF beamline. The team isolated a pair of enzymes from the gut microbiome of an AB+ donor and, with the help of the CLS, were able to understand a previously unknown enzyme's affinity for A-type blood antigens. This enzyme was able to cleave all A subtypes effectively, allowing the team to convert a unit of A-type blood to O-type. This converted blood is being tested for any adverse effects and brings the researchers closer to converting any donated blood to a universal type. DOI:10.1038/s41564-019-0469-7

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# A potential therapy for treatment-resistant depression

Up to one third of adults with major depression battle symptoms that don't respond to treatment. Researchers from Cambridge Massachusetts' Navitor Pharmaceuticals used CLS's CMCF beamline to visualize a molecule with potential to be developed as a therapeutic in the treatment of drug-resistant depression. This molecule, NV-5138, has been linked to our brain's ability to sense and respond to nutrients. They investigated the ability of this molecule to regulate the mTORC1 pathway, which is responsible for cellular metabolism. They found that NV-5138 can bind to and regulate a sensor which can help to mediate dysfunction in the pathway. DOI:10.1038/s41598-019-40693-5





### Helping people to hear

Mapping the inner ear allows researchers to understand anatomical variations and can assist with better design and placement of cochlear implants to partially restore hearing for those with profound hearing impairments. With the help of BMIT's imaging techniques, a team of researchers from Uppsala University Hospital and Western University were able to create three-dimensional images of the cochlea—a spiral shaped structure in the inner ear. The team was able to see how electrodes fit inside the structure and show how they stimulate the auditory nerve. This allows them to create optimal stimulation strategies for the nerve, helping to create better implants for patients. DOI:10.1097/AUD.00000000000738

### Finding the right puzzle piece to stop cancer growth

Using the CMCF beamline, researchers from McGill University used the CLS to study a new class of compounds that could help develop novel therapies for age-related cancers, including prostate and breast cancer. Cancers are second only to heart disease as the leading cause of death in people over age 60. By investigating the interactions between therapies and their cellular targets the team can determine which forms of molecules help to slow cancer growth, and develop effective inhibitors.



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### Developing more nutritious crops to feed a growing world

University of Saskatchewan and CLS scientists have developed a synchrotron technique to analyze new varieties of peas. The technique, which uses the IDEAS beamline, could be faster and more environmentally friendly than traditional techniques and could in turn help to nourish underfed populations around the world. This faster method for determining protein, starch and micronutrient levels allows plant breeders to select the best seed line for crop production. Nutritional profiles like these are important to companies and consumers alike. Conventional methods also include chemical preparation which takes time and demands larger samples sizes, making the CLS a better option for data collection. DOI:10.2135/cropsci2019.01.0004



### Ancient farming practices can improve crop production and offset climate change

Researchers from the University of Rostock used the CLS to analyze samples from across Germany, Norway and Denmark to investigate the uniquely long-lasting fertility of the region's soils. 6,200-4,800 years ago, farmers in this area spent considerable time and effort improving soil that still benefits from those inputs today. They found that extraordinarily high concentrations of phosphorus was common between all samples. This information indicated peat, manure, composts and bone char had been added to the soil from as far back as the Nordic Bronze Age, the Viking age and the Roman Iron Age. The fertility of the soils amended in ancient times suggests a way forward in assuring food production for a rapidly growing world population today.

DOI:10.3390/soilsystems3040072

### **Baking the perfect loaf**

Researchers from the University of Manitoba used the CLS to study the science of baking bread. Health Canada recommends that Canadians reduce the amount of sodium in their diets, and reducing the salt in bread could make a huge contribution to that goal. The team used BMIT to investigate how reduced sodium changes tiny bubbles in the dough. The scientists found that reduced salt created a stickier dough, which has implications in large-scale processing. There were also fewer bubbles in the dough samples prepared using stronger wheat cultivars, higher water contents and shorter mixing times. DOI:10.1016/j.foodres.2019.108919



### Helping crops withstand drought and climate change

Climate change can hurt crop yields and threaten food security. University of British Columbia and Agriculture and Agri-Food Canada scientists investigated a technique that will help researchers understand how plants respond to environmental challenges like drought stress. Using a model plant, Arabidopsis, the researchers can apply their findings to other common crops like cabbage and mustard. The technique uses the MID-IR beamline and is more efficient, faster and non-destructive when compared to standard techniques like gas chromatography. It illustrates that synchrotron technologies can help to advance agriculture research and improve crop health. DOI:10.1111/pce.13691

### Cycling rice and shrimp farming in Vietnam important for food security

A collaboration between German and Vietnamese researchers has shown that cycling the cultivation of rice and shrimp is an option for rice farmers who have been affected by climate change in Vietnam. The water that the rice is traditionally grown in has been seeing an increase in salt levels which affects the growth of the crop. This is a danger to rice farmers' livelihoods. The alternative is changing to shrimp farming or to an alternative rice-shrimp production cycle. The CLS allowed the scientists to study nutrient profiles of the soil and help determine how alternating shrimp and rice can give farmers more flexibility. DOI:10.1016/j.scitotenv.2019.134758



### Filtering for crystal-clear water anywhere in the world

A team of scientists from the University of Regina is working to improve water filtration for underdeveloped and remote areas of the world where accessing clean water is particularly difficult. Porous ceramic disk filters disk can be made from local clay and are an inexpensive way to filter raw water without an energy source. However, the filter can become clogged with contaminants over time. The team, along with colleagues from Concordia University, Memorial University of Newfoundland and China, investigated the use of iron-titanium dioxide nano-composites to help improve bacterial filtration, especially with *E.coli* contaminated water.

DOI:10.1016/j.jwpe.2019.101013



#### Keeping nuclear power safe

Using the CLS, researchers from Savannah River National Laboratory to help ensure that waste from nuclear power plants remains safe and secure for thousands of years to come. With the help of HXMA, researchers were able to identify the various types of concrete that are best for containing the different species of iodine, which can be a concerning environmental contaminant, by visualizing how iodine leaches out of concrete. This information can guide and improve iodine management and disposal at sites worldwide. DOI:10.1016/j.envint.2019.02.070



### Analyzing the world's oldest woody plant fossil

Mapping the evolution of life on Earth requires a detailed understanding of the fossil record, and scientists used the CLS to look back at the cell structure and chemistry of the earliest known woody plant. Investigators from the Natural History Museum in England and the Muséum national d'Histoire naturelle in France used the SM beamline at the CLS to study a 400-million-year-old extinct woody plant, Armoricaphyton chateaupannese. They focused on lignin – a protein that helps transport water within plants and makes cell walls rigid. The team was able to identify lignified cells and shed light on plant evolution. DOI:10.1111/pala.12440

### Using soil to combat climate change

Soil is one of the most important natural carbon sinks on Earth, and understanding its role in carbon cycling could help combat climate change. Scientists from the University of Massachusetts the plant root mechanisms that control long-term storage of carbon in deep soil. Their findings will have ramifications for global industries such as agriculture, which have touted the benefits of carbon sequestration as their contribution to fighting climate change. Decaying roots and plant matter are known to be important sources of soil carbon, and the team showed that this process also releases stored carbon from minerals, which is lost to the atmosphere as carbon dioxide.

DOI:10.1016/j.gca.2019.07.030



### **Enhanced tandem solar cells set** new standard in converting light into electricity

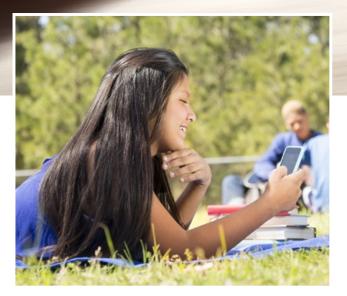
Using the CLS, researchers from the University of Toronto and King Abdullah University of Science and Technology worked with silicon solar cells to overcome overcome the limits in silicon efficiency. Perovskite crystals (often used to absorb solar energy) can excite electrons, channel them into a circuit and can be mixed with liquid to create a type of solar ink that can be applied to surfaces. The team created a tandem solar cell by adding a thick layer of perovskite on top of silicon, which enhanced performance. This has the potential to lower the cost of solar cells. DOI:10.1126/science.aaz3691



### Improving engine performance and fuel efficiency

An investigation at the CLS looked at the chemistry of lubricating oils in vehicle engines. Researchers from the University of Texas at Arlington used several beamlines to study the effect soot has on engine wear. The team found that reformulating engine oil could extend the lifespan of the engine and reduce emissions. It was found that the interaction of additive elements like calcium, sulphur and phosphorus with soot can cause these soot particles to become highly abrasive, leading to increased wear. Alternative additives would help to decrease damage incurred by the engine and decrease the frequency of oil changes.

DOI:10.1021/acs.energyfuels.8b03841



### Canadian researchers extend the life of rechargeable batteries

According to a team of researchers from Western University, the life of lithium-ion rechargeable batteries can be extended up to 50% by adding a carbon-based layer. Aluminum foil is a lightweight and cost-effective material that is commonly used on the cathode of the battery, but it corrodes easily. The researchers applied a thin layer of carbon coating to the battery's aluminum foil and found that this resulted in a protective effect that prevented corrosion. DOI:10.1021/acsami.9b06442



### A path to carbon-neutral plastics

A team of scientists from the University of Toronto and the California Institute of Technology used the CLS to analyze improvements to the technique that can convert CO<sub>2</sub> and water into ethylene, a precursor to plastic. The system, originally produced by the U of T in 2018, has undergone modifications with the help of Caltech – helping to enhance performance and lower cost. If powered by green energy, like solar, this technique could sequester a harmful greenhouse gas and convert it to useful plastics.

DOI:10.1038/s41586-019-1782-2

### Using crystal materials to improve electronic devices and artifical intelligence

Using the CLS, scientist from Rutgers and Purdue Universities investigated common defects in perovskite crystals, which are widely used in solar cells and other electronics applications. The team showed that the defects can be manipulated to control the flow of electricity in the crystal. This finding can help improve devices and prevent them from shorting out. They also found that these materials could be of use in artificial intelligence and can be engineered to mimic nerve cells. DOI:10.1073/pnas.1910490116



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### The future of electronics is bendy

With the help of HXMA, scientists from the University of Windsor are working to create next-generation flexible electronics. The use of polymers and organic materials can make devices wearable and more conformable. With current bendy technology, devices can be stretched and shaped but the material often fails. In partnership with PolyAnalytik, a company based out of London, Ontario, the researchers have turned their focus to polyethylene. On the beamline, they found that polyethylene helps their materials maintain electronic properties while become more stretchable.

DOI:10.1021/acs.macromol.9b01697



# FINANCIAL HIGHLIGHTS

### **Financial Highlights for the year** ended March 31, 2020

(in thousands of dollars)

Funding for fiscal 2020 totaled \$35,603, comprised of Federal, Provincial, University of Saskatchewan, and CLS selfgenerated revenue sources.

Federal grants, representing 71% of overall operating funding, totaled \$25,390 and included funding from a variety of federal funders including CFI, NSERC, CIHR and NRC.

Provincial and University of Saskatchewan funding remained consistent with the prior period, representing 12% and 7% of overall operating funding for the facility.

Industrial and other revenue experienced strong growth in the current fiscal year, increasing in excess of \$1,764. This is partially a result of the unplanned shutdown that occurred during the 2019 fiscal year, which resulted in lower Industrial Science program revenue, however the industrial program was able to recognize record revenue of \$1,502, an increase of \$400 from the annual period high.

Operating expenditures totaled \$34,910, consisting of salaries and benefits, repairs and maintenance, supplies and services, and utilities.

Salary expenditures totaled \$22,653 in the period, an increase of \$2,225 from the prior period and representing 65% of operating costs. The increase is due to CLS implementing its work force plan, increasing salary positions in order to ensure world class beam and service is provided to our users.

Repairs and maintenance expenses totaled \$3,471, representing 10% of operating expenditures. Repairs focus on maintaining and improving the core facility (LINAC, booster and storage rings), as well as the operating beamlines at the CLSI.

Supplies and services costs totaled \$5,480, representing 16% of operating expenditures. Supplies and services are key to operating the facility, providing consumables for the facility and necessary consulting and service contracts.

Utilities in the year represented 10% of operating costs for a total of \$3,306, an increase of \$800 from the prior period. The increase from the prior period is a result of 2019 unplanned shutdown which lead to lower utility demand at the facility, thus the current year represented a return to normal consumption.

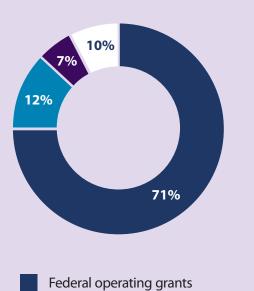


#### REVENUE

Federal Operating Grants	\$ 25,390
Provincial Operating Grants	4,100
Grant from UofS	2,620
Other Revenue	3,493

\$

35,603



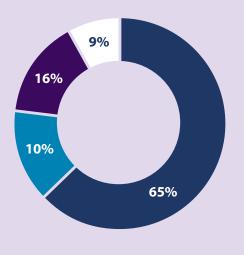
Provincial operating grants Grant from U of S Other revenue

#### **EXPENSES**

Salaries and Benefits	\$ 22,653
Repairs and maintenance	3,471
Supplies and services	5,480
Utilities	3,306

\$

34,910



Salaries and benefits Repairs and maintenance Supplies and services Utilities

### A little **birdie**

### told us...





#### CanadianLightSource

Thank you to Dr. Mona Nemer for touring the CLS and for her interest in how synchrotron light can benefit research in agriculture, health, environment, and advanced materials. efCan #MIDIR #VLSPGM #BioXAS #BMIT



#### CanadianLightSource

These are pieces of shell from a duck-billed dinosaur egg! The samples were analyzed on our #MidIR beamline this week. We can't wait to find out more about them from the @UofR ina & @RoyalTyrrell research team





Stefan Kycia @uofg is the first outside user on #Brockh ouse and a big part of the project's development. Looking at polymer tubing and amorphous selenium, he is taking measurements that wouldn't be possible without #BXDS, @GuelphPhysics @MountAllison bit.lv/2PCFPte



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Isabelle Blain, Chair of our Board of Directors, was delighted to attend today's luncheon celebrating Indigenous Economic Development day. Congratulations to all the awardees! @SFNEDN @MiltToot



CanadianLightSource @CartLightSource + Mar 10 V "Oathering of Incigences STEM students builds kinship across the country" - near the full storp My Gurasschwark, Benie Path (Ingith) is the CLS Education Coordinator for Indigences Programs, pictured at the CLS built for an extension of the CLS BackSE ye th for ac SES2020, @\_ca



CanadianLightSource @CanLightSource + Jan 7 NEWS RELEASE: CLS launches nation-wide science project Children across the country can participate in TREE, a free nation-wide science project, and learn the secrets trees can tell about their



CanadianLightSource @CanLightSource + Nov 26, 2010 Some young scientists recently look a tour of the CLS with their class and were kind encough to send us handwritten letters. There yout These made our day, at 32 ye



#### CanadianLightSource

Our 2019 staff photo compared to 2001. Look how we've grown!



104 PM - May 27, 2019 - Bull



CanadianLightSource @CanLightSource - Feb 25 Scientists from @RutgersU & RurdueU used the CLS to study rare earth materials that may help to mimic the way our brains learn, improve electronics & artificial intelligence, and hide objects from infrared cameres. Full story: EufLyQ2H36p Photo credit @LifeAtPundue ye



Researchers from @mcgillu used the CLS to study a new class of compounds that could help develop novel therapies for age-related cancers, including prostate and breast cancer. Cancers the second leading cause of death in people over age 60. #McGill @usask



22 LIGHTSOURCE.CA

CanadianLightSource @CanLightSource · Mar 31

Thank you to @InnovationCA for 21 years of support! On March 31, 1999, the Canada Foundation for Innovation contributed \$56.4 million to help build the CLS, which is one of the largest science projects in Canada's history and a critical tool for Canadian research and development.



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nLightSource @CanLightSource - Mar 25 ye Since we use medical-grade gloves in our labs, we were able to conate 2000 surplus gloves to Saskatoon's Royal University Hospital. Let's all do what we can to help others during this difficult time. #COVID19

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CanadianLightSource @CanLightSource - Aug 11, 2019

in humans. #SXRMB Read the full story: buff.ly/2T/VMF1

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Preventing heart attacks: Ophélie Gourgas holds a sample used to study vascular calcification, or hardening of the blood vessels and heart valves

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CanadianLightSource @CanLightSource - Nov 18, 2019 y Canadianughtsource (scanLightsource) how 10, 2019 RWS RELEASE (Western) researchers used the CLS to identify a coaling that can extend battery life by 50%, which could help lead to next-generation batteries in electric vehicles. Full story: buff.ly/2C007eW



#### CanadianLightSource

The CLS is proudly flying the #Pride flag in support of the rideFestival, which emphasizes many of the values #Saskat we stand for: inclusion, diversity and building a safe, welcoming space for people of all sexual orientations and gender identities. #vxepride @PrideSaskatoon



12:01 PM - Jun 10, 2019

CanadianLightSource @CanLightSource - Jun 12, 2019 Don't miss the first ever Pan-American Light sources for Agriculture conference #PARE.52010 will beine a light on the growing relationst between agricultural science and synchotron-based techniques! Rep method II MURIDED OFUEDD wave Difference by 19 ¥ niques! Register



CanadianLightSource

Minister @KirstyDuncanMP announces \$39 million in funding from @InnovationCA for seven facilities: @usask's Canadian Light Source, @VIDOInterVac, @Ocean\_Networks, SNOLABscience, CCGS Amundsen, @OceanTracking, and Canada's National Design Network. Thank you!



11:52 AM - Apr 29, 2019 - Bu

Join us now until 1am @NuitBlancheYXE! Artist @JSGauthier and biologist Dr. Brian Eames created an interactive #SciArt display that uses 3D images produced at CLS. Interact with #OurGlass we're beside Fionn MacCool's, 355 2nd Avenue South. #NBYXE Details: huffle



7-35 PM - Son 28, 2019 - Putt

CanadianLightSource @CanLightSource - Jul 31, 2019 Watch next week's epicode of Anazing Race Canada to get a glimpse Inside the CLSI @AnazingRaceCDA @VisitSaskaton #AnazingPaceMonth y

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#### CanadianLightSo

Our staff were happy to celebrate the summer this week with the inaugural CLS Summer Games. Friendly competition, food, and trophies: it's never a dull moment here.



@Usask PhD student Arthur Situm used the CLS to develop a new technique for studying how steel rusts, which may be helpful to local mining and construction initiatives. uff.ly/2VUgESG

Part of @T Vouno Inc



ANNUAL REPORT 2020 23

# Thank You

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





UNIVERSITY OF SASKATCHEWAN

**Canadian Light Source Inc.** 

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www.lightsource.ca

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