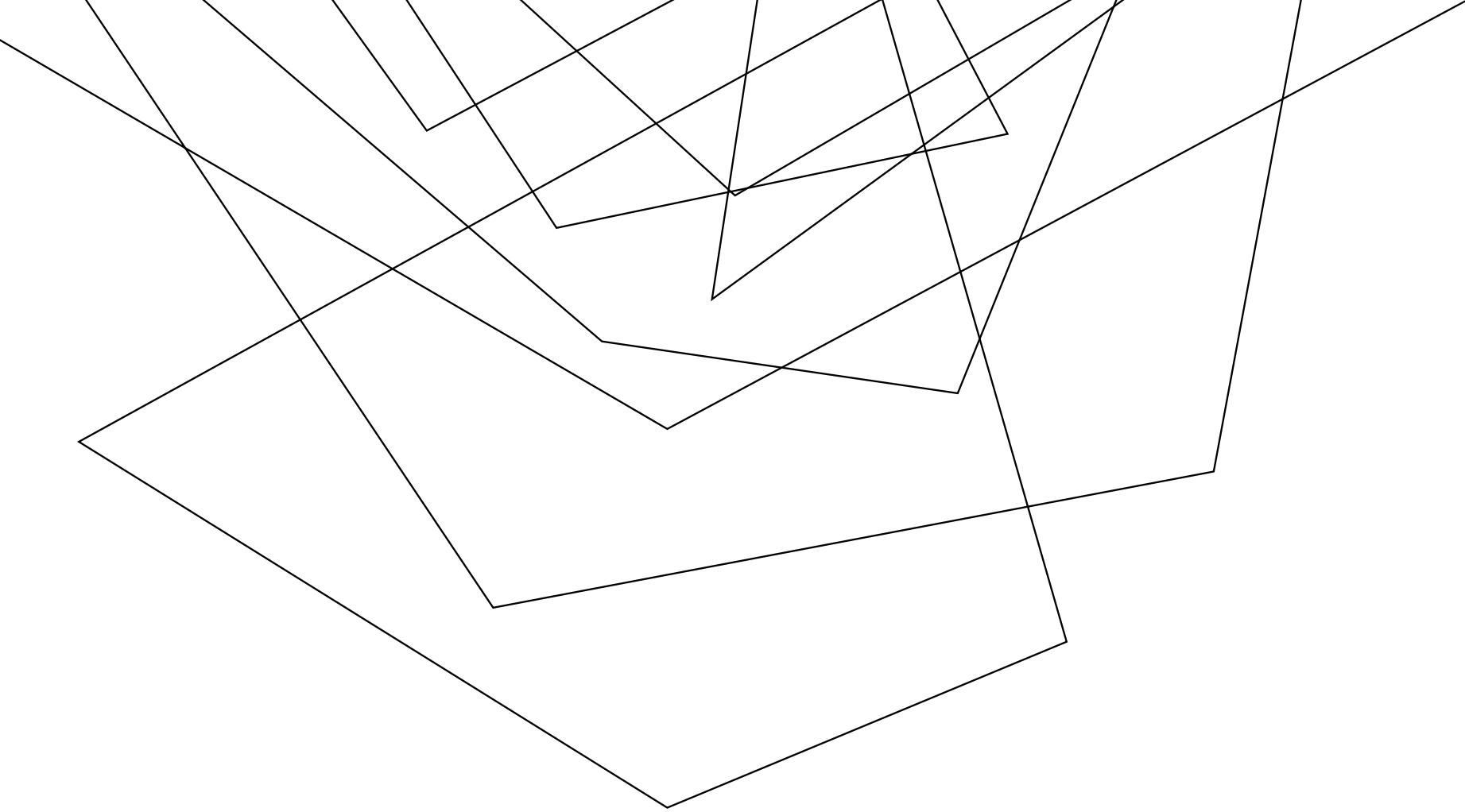




NAVIGATING DIGITAL RESEARCH INFRASTRUCTURE: FINDING TRAINING, RESOURCES AND SUPPORT

PRESENTER: ANN ALLAN
TRAINING COORDINATOR COMPUTE ONTARIO

TOPICS

- Digital Research Infrastructure
- Ontario DRI Organizations
- Ontario Consortia-Systems
- National Systems-CCDB
- Ontario Consortia-Training
- Compute Ontario-Collaborative Training Initiatives
- Training-Getting Started Explora

DIGITAL RESEARCH INFRASTRUCTURE (DRI)

“Digital Research Infrastructure (DRI) encompasses high-performance computing power, data storage, high speed networks, software, expertise and training. Its purpose is to enable researchers to work with massive data-sets and use artificial intelligence, machine learning, mathematical modelling and other advanced methods to power scientific breakthroughs.”

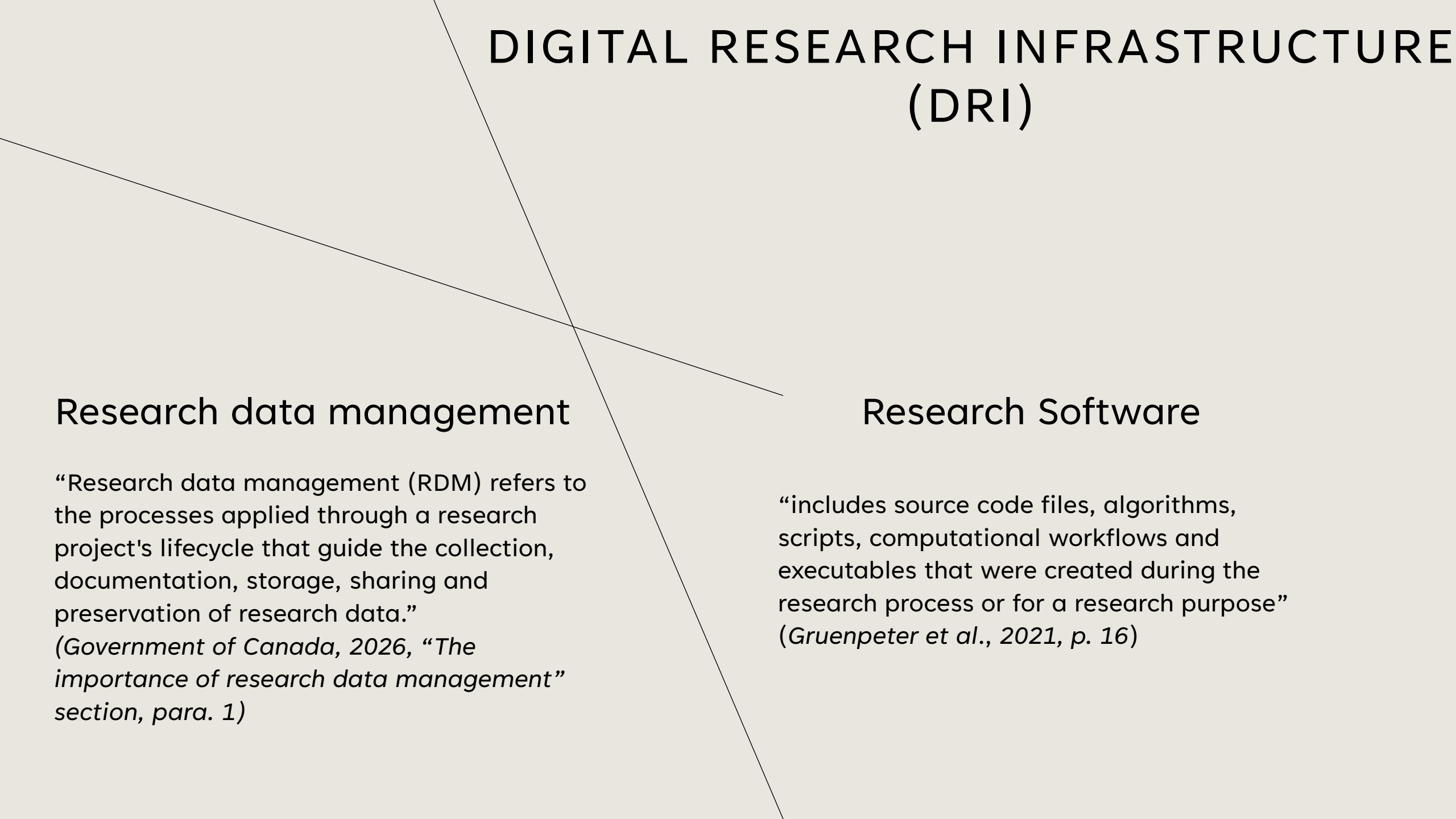
(Compute Ontario, n.d., para. 1)

High-Performance Computing

“High-performance computing (HPC) is the ability to process data and perform complex calculations at high speeds.”

(NetApp, n.d., para. 1)

DIGITAL RESEARCH INFRASTRUCTURE (DRI)



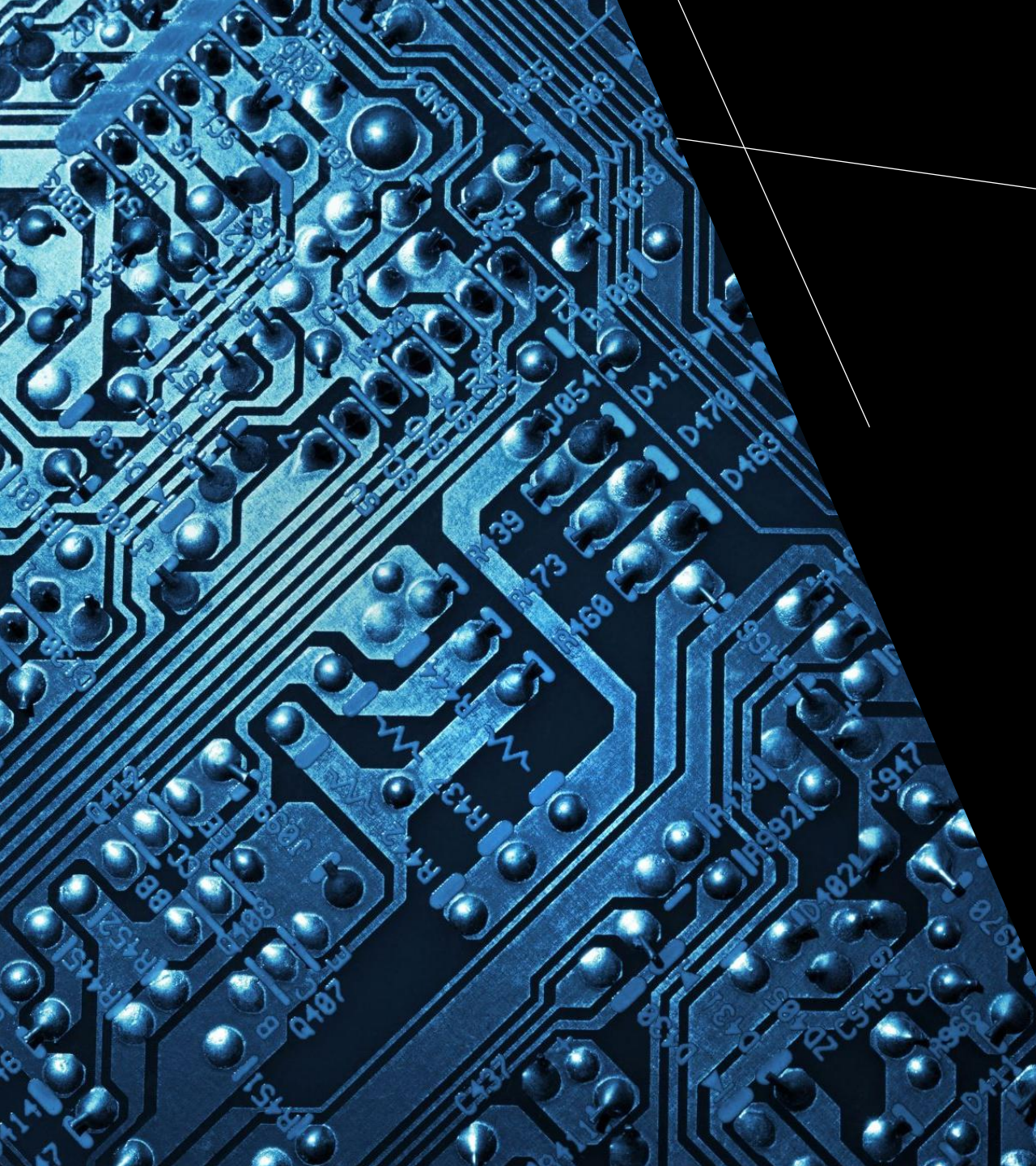
Research data management

“Research data management (RDM) refers to the processes applied through a research project's lifecycle that guide the collection, documentation, storage, sharing and preservation of research data.”

(Government of Canada, 2026, “The importance of research data management” section, para. 1)

Research Software

“includes source code files, algorithms, scripts, computational workflows and executables that were created during the research process or for a research purpose”
(Gruenpeter et al., 2021, p. 16)



ONTARIO DRI ORGANIZATIONS

Compute Ontario

SHARCNET

SciNet

HPC4Health

Centre for Advanced Computing (CAC)

Other Partners: [Digital Research Alliance of Canada](#),
[Ontario Brain Institute](#), [Ontario Institute for Cancer
Research](#), [Bioinformatics.ca](#), [Clinical Trials Ontario](#),
[Scholars Portal](#), [Vector Institute](#) and many more

ONTARIO CONSORTIA-SYSTEMS

SHARCNET

- Nibi –National system
- Hosted at University of Waterloo
- 19 Partner organizations
- Systems Help: support@tech.alliancecan.ca
- General Help: help@sharcnet.ca

SCINET

- Trillium –National system
- S4H – Secure enclave for HPC jobs involving sensitive data (Level 3 data)
 - Available to University of Toronto PIs, Other individual requests can be evaluated
- Hosted at University of Toronto
- Systems Help: trillium@tech.alliancecan.ca
- General and S4H Help: support@scinet.utoronto.ca

ONTARIO CONSORTIA-SYSTEMS

CENTRE FOR ADVANCED COMPUTING (CAC)

- Frontenac
- Available to Queen's University faculty members, staff, students and collaborators (note even student collaborators)
- Hosted at Queen's University
- Help: cac.help@queensu.ca

ONTARIO CONSORTIA-SYSTEMS

HPC4HEALTH

- Partnership between the Hospital for Sick Children and the Princess Margaret Cancer Centre at UHN
- Hosted by [SickKids Centre for Computational Medicine](#)
- The Research IT-High performance Computing (RIT-HPC)
- Available to SickKids and UHN researchers and clinicians
- Groups outside member institutions may request to use services on a cost recovery basis
- Systems Help UHN: [Richard Wintle](#) or [Elaine C Chang](#)
- Systems Help SickKids: researchhelpdesk@sickkids.ca

NATIONAL SYSTEMS

- Ontario Provincial systems are also supported by the Digital Research Alliance of Canada
- **The National Systems** [Wiki Pages](#)
 - The Systems/ What is available?
 - Getting an Account/CCDB
- [Alliance Service Catalogue](#)

[Wiki Main Page](#)

[Support](#)

[Getting an account](#)

[Getting started](#)

[Getting help](#)

[Running jobs](#)

[System status](#)

[Resources](#)

[Fir](#)

[Narval](#)

[Nibi](#)

[Rorqual](#)

[Trillium](#)

[Cloud](#)

[Killarney](#)

[tamIA](#)

[Vulcan](#)

[Quantum computing](#)

[Available software](#)

[The Alliance](#)

[Alliance website](#)

[CCDB](#)

[Resource Allocation
Competition \(RAC\)](#)

[Acknowledging the
Alliance](#)

[Alliance policies](#)

Source: Digital
Research Alliance of
Canada (2026,
September 2)

- Needed to access the national high-performance computing systems
- Any faculty member at a [CFI-eligible Canadian university](#) is eligible to register and, can then sponsor the students and research collaborators
- If you're not sure how to get an account, you can contact:
accounts@tech.alliancecan.ca

WHAT IS A CCDB?

CCDB Roles

Type	Role	Definition	Key characteristics
Academic Principal Investigator	Faculty	You are a full-time or part-time faculty member at a Canadian university, college or research hospital that is eligible to hold CFI grants.	- Can access Federation resources and services free of charge. - Is eligible to request resources via the Rapid Access Service (RAS). - Is eligible to apply to the Resource Allocation Competitions (RAC). - Can sponsor users.
	Adjunct Faculty	You are a full-time or part-time Adjunct Faculty member at a Canadian university, college or research hospital that is eligible to hold CFI grants.	
	Librarian	You must be a librarian working at a Canadian university or college that is eligible to hold CFI grants.	
Research Institute Principal Investigator	Research Institute PI	You are a lead researcher at a Canadian research institute that is eligible to hold CFI grants. Please consult with a regional representative before requesting this role by writing to support@tech.alliancecan.ca	- Can access Federation resources and services free of charge. - Is eligible to request resources via the Rapid Access Service (RAS). - Can sponsor users.
Government, Industry, Non-for-profit Principal Investigator	Non-academic PI	You are a lead researcher at a for-profit company, a non-for-profit organization or for the Government and want to apply for paid access to Federation resources and services. Please consult with a regional representative before requesting this role by writing to support@tech.alliancecan.ca.	- In certain circumstances, may apply for paid access to Federation resources. - Can sponsor users.
Sponsored User	Undergraduate Student	You are an undergraduate student.	- Can access resources available to the PI, at the PI's discretion. - Require a sponsor to create an account on CCDB.
	Master's Student	You are a master's student.	
	Doctoral Student	You are a doctoral student.	
	Postdoctoral Fellow	You are a postdoctoral fellow.	
	External Collaborator (or Visiting Faculty)	You are a collaborator based at an institution different from that of your sponsor.	
	Researcher	You are a researcher employed by your sponsor's institution.	
	Non-research Staff	You are a staff member providing support for a research group in a non-research capacity.	
			Source: Digital Research Alliance of Canada (2026, September 2)

National Systems-Advance Research Computing Resources

Non-competitive		Competitive
Default access <i>Start right away</i>	<u>Rapid Access Service</u> <i>I need a bit more</i>	<u>Resource Allocation Competition</u> <i>I need more than RAS</i>
Create an account. Storage: 1 TB of /project storage granted automatically in <i>most</i> clusters. CPU/ GPU: available for opportunistic use (<i>resources are not guaranteed but there is no cap either</i>).	With a simple request users receive: • additional /project and /nearline storage. • basic cloud resources. (CPU and GPU access is the same as Default).	• Users with Faculty, Adjunct Faculty and Librarian positions only. • Any <u>available resource</u> can be requested. • No maximum limit is imposed on resource requests. • Resources available are scaled across all research disciplines.

Source: Digital Research Alliance of Canada (n.d.)

A series of white, thin, overlapping geometric lines on a black background, forming a complex, abstract shape on the left side of the slide.

TRAINING

ONTARIO CONSORTIA-TRAINING

SHARCNET-TRAINING

- [SHARCNET Training Help](#)
- [Events Calendar](#)
- [Newsletter/Events Mailing List](#)
- SHARCNET Webinar Series: Every two weeks on Wednesdays
- [Q&A sessions for new users](#): Tuesdays 2:00pm-3:00pm
- [Youtube Channel](#)
- [Log-in](#) Training Site (requires a CCDB)
- [New User Course](#)
- [Self-paced courses](#)
- [Live Online 2026-2027 Introduction to ARC Courses](#)

Events Calendar

September 2026						
SUN 30	MON 31	TUE Sep 1	WED 2	THU 3	FRI 4	SAT 5
		• 2pm Q&A sessi				
6	7	• 2pm Q&A sessi	• 12pm Update o	10	11	12
13	14	• 2pm Q&A sessi	16	17	18	19
20	21	• 2pm Q&A sessi	• 1pm Webinar "A	24	25	26
27	28	• 2pm Q&A sessi	30	Oct 1	2	3

Source: SHARCNET (n.d.).

ONTARIO CONSORTIA-TRAINING

SHARCNET-TRAINING

Self-Paced Courses

Course Title	Estimated time to Complete
<u>New User Course</u>	1 Hour
<u>Mastering the Alliance Job Scheduler</u>	1-4 Hours
<u>Mastering GPU Efficiency</u>	1 Hour
<u>Introduction to the Shell</u>	NA
<u>Introduction to SQL</u>	3-4 Hours
<u>Introduction to Machine Learning</u>	NA
<u>Introduction to GPU Programming</u>	3-4 Hours
<u>Bioinformatics</u>	2 Hours

ONTARIO CONSORTIA-TRAINING

SHARCNET-TRAINING

Live Online 2026-2027 Introduction to ARC Courses

Course Title	Date	Time (ET)
<u>Introduction to Cmake</u>	Tues. Sept. 29 Fri. Oct. 2	1pm-2pm
<u>Introduction to GPU Programming</u>	Tues. Oct. 6 Fri. Oct. 9 Tues. Oct. 13 Fri. Oct. 16	1pm-2pm
<u>Mastering GPU Efficiency</u>	Tues. Oct. 20 Fri. Oct. 23	1pm-2pm
<u>Python for High Performance Computing</u>	Tues. Oct. 27 Fri. Oct. 30 Tues. Nov. 3 Fri. Nov. 6	1pm-2pm
<u>Introduction to AI agents in research</u>	Tues. Nov. 10 Fri. Nov. 13	1pm-2pm

ONTARIO CONSORTIA-TRAINING

SHARCNET-TRAINING

Live Online 2026-2027 Introduction to ARC Courses

Course Title	Date (ET)	Time (ET)
<u>Engineering Software</u>	Tues. Nov. 17 Fri. Nov. 20	1pm-2pm
<u>Working with Jupyter on the Clusters</u>	Tues. Nov. 24 Fri. Nov. 27	1pm-2pm
<u>Tidyverse: Data Science with R</u>	Tues. Dec. 1 Fri. Dec. 4 Tues. Dec. 8	1pm-2pm
<u>Mastering the Alliance Job Scheduler</u>	Fri. Dec. 11 Tues. Dec. 15 Fri. Dec. 18	1pm-2pm
<u>A Practical Guide to Windows Subsystem for Linux (WSL)</u>	Tues. Jan. 12 Fri. Jan. 15	1pm-2pm
<u>High Performance Computing C++</u>	Tues. Jan. 19 Tues. Jan. 26 Fri. Jan. 29	1pm-2pm

ONTARIO CONSORTIA-TRAINING

SHARCNET-TRAINING

Live Online 2026-2027 Introduction to ARC Courses

Course Title	Date (ET)	Time (ET)
<u>Efficient Deep Learning with PyTorch</u>	Tues. Feb. 2 Fri. Feb. 5 Tues. Feb. 9 Fri. Feb. 12	1pm-2pm
<u>Fundamentals of Retrieval-Augmented Generation</u>	Tues. Feb. 16 Fri. Feb. 19 Tues. Feb. 23	1pm-2pm
<u>Visualization</u>	Fri. Feb. 26 Tues. Mar. 2	1pm-2pm
<u>Using Apptainer Containers</u>	Fri. Mar. 5 Tues. Mar. 9	1pm-2pm
<u>Fundamentals and Practice of advanced research computing</u>	Tues. Mar. 16 and Thurs. Mar. 18 Tues. Mar. 23 and Thurs. Mar. 25 Tues. Apr. 6 and Thurs. Apr. 8 Tues. Apr. 13 and Thurs. Apr. 15	1pm-2pm

ONTARIO CONSORTIA-TRAINING

SCINET-TRAINING

- [Log-in](#) Training Site (need a CCDB to get Certificates but can request an account courses@scinet.utoronto.ca. if you're affiliated with a Canadian academic institution)
- [News](#)
- [Youtube Channel](#)
- [Course Catalogue](#): Past recordings, slides and other materials open access
 - General, Domain Specific, Seminars
- [Upcoming courses](#)
- [Self-paced](#)

ONTARIO CONSORTIA-TRAINING

SCINET-TRAINING

Course Catalogue

General Categories	Domain Specific Categories
<u>Getting Started-Introductory courses</u>	<u>Physical Sciences-Courses which emphasize the physical sciences</u>
<u>Research Computing – Further research computing courses</u>	<u>Biomedical and biochemistry-Courses for medical and biochemistry students</u>
<u>Cybersecurity- Courses on tools and principles to secure your research</u>	<u>Genomics-Courses about sequencing and genetics</u>
<u>Research Data Management – Practical data management courses</u>	<u>Medical Imaging- Courses about sequencing and genetics</u>
<u>Data Science and Machine Learning-Data analysis courses</u>	<u>Quantum computing- Courses in quantum computing</u>
<u>High performance computing- Parallel computing courses</u>	
<u>Visualization</u>	

ONTARIO CONSORTIA-TRAINING

SCINET-TRAINING

Upcoming Courses

Course Title (Live)	Date	Time (ET)
Intro to Containers	Tues. Oct. 6	2pm-4pm
Scaling Up: Mastering HPC	Mon. Dec. 7	1pm
Scientific Computing for Physicists	Tues. Jan. 12 Thurs. Jan. 14 Tues. Jan. 19	11am-12pm
Course Title (Self-paced)	Estimated time to Complete	
Intro to SciNet and Trillium	4 Hours	
Intro to Git Version Control	6 Hours	

ONTARIO CONSORTIA-TRAINING CENTRE FOR ADVANCED COMPUTING (CAC)-TRAINING

- [News](#)
- [Youtube Channel](#)
- [Workshop Listings](#)
- [Training and Events](#)
 - [Women in HPC: Meet and Greet: Tues. Sept 29.](#)
[12pm-1:30pm](#)



ONTARIO CONSORTIA-TRAINING

CENTRE FOR ADVANCED COMPUTING

(CAC)-TRAINING

Workshops

Introduction to High-Performance Computing (HPC)

Introduction to Linux

Introduction to REDCap

Introduction to Python Programming

Introduction to Parallel Programming with Python using MPI

Text Mining

Data Preparation

Virtual Assistants on the Cloud (Chatbots)

Machine Learning

Introduction to Spark

Introduction to Bioinformatics

ONTARIO CONSORTIA-TRAINING

HPC4HEALTH/CENTRE FOR COMPUTATIONAL MEDICINE (CCM)-TRAINING

Fall Training Schedule: Contact Andrei Turinsky (turinsky@sickkids.ca) for registration and more info

Date	Time	Topic
Tues Sept 15	12:00 – 1:00 pm	Introduction to R Programming
Tues Sept 22	12:00 – 1:00 pm	Data exploration and visualization in R
Tues Sept 29	12:00 – 1:00 pm	Statistical tests and models in R
Tues Oct 6	12:00 – 1:00 pm	Research Data Management (RDM): best practices
Tues Oct 13	12:00 – 12:45 pm	Genomic data analysis and visualization using Seqr
Tues Oct 20	12:00 – 1:00 pm	Introduction to Python Programming
Wed October 28	12:00 – 1:00 pm	Open OnDemand: HPC the easy way
Tues Nov 3	12:00 – 1:00 pm	Accelerating research with GPU on HPC
Thurs Nov 12	12:00 – 1:00 pm	Reproducible data analysis & bioinformatics
Thurs Nov 19	12:00 – 1:00 pm	Free tools and resources for protein sequences and structures
Tues Nov 24	12:00 – 1:00 pm	Handling sensitive research data
Tues Dec 1	12:00 – 1:00 pm	Genomics and transcriptomics pipelines
Tues Dec 8	11:30 am – 12:30 pm	Introduction to single-cell transcriptomics

Source: Centre for Computational Medicine (2026).

COMPUTE ONTARIO COLLABORATIVE TRAINING INITIATIVES

- [Community Developed Learning Resources](#)
 - Advanced Research Computing, AI and ML
 - Research Data Management
 - Research Software
- [Compute Ontario Colloquia:](#)
 - Every other Wednesday from 12pm-1pm
 - Live: Recordings available after the event
- [Compute Ontario Summer School](#)
 - First 3 weeks of June
 - Live sessions
 - Materials available after courses



COMPUTE ONTARIO COLLABORATIVE TRAINING INITIATIVES

Community Developed Learning Resources: Advanced Research Computing, AI and ML

- [Introduction to advanced research computing using Digital Research Alliance of Canada resources](#), *Carleton University*
- [Introduction to SciNet and Trillium](#), *SciNet*
- [Introduction to GIT Version Control](#), *SciNet*
- [Introduction to AI and ML, with RDM integration](#), *University of Ottawa*
- [Introduction to advanced research computing in fluid dynamics](#), *University of Waterloo*



COMPUTE ONTARIO COLLABORATIVE TRAINING INITIATIVES

Community Developed Learning Resources: Research Data Management

- [Introduction to Reproducible Neuroimaging Analysis](#), SickKids Research Institute and University of Toronto
- [REDCap RDM Toolkit: From Project Planning to Data Repository](#), WE SPARK Health Institute
- [Good data handling practices for researchers](#), University of Ottawa Heart Institute and Ottawa Hospital Research Institute
- [Research Data Management \(RDM\) knowledge, skills, tools and best practices](#), Canadian Bioinformatics Workshops, Ontario Institute for Cancer Research, McGill University, Pan-Canadian Genome Library
- [Research data management in the college and small institution context](#), Heads of Applied Research and the Ontario Colleges RDM Community of Practice
- Selecting the right data repository, Toronto Metropolitan University: [Data Repository Primer](#), [Data Repository Navigator](#)
- [Data-sharing best practices health care/medicine](#), University of Toronto and McMaster University
- [RDM and text data mining in JupyterHub](#), University of Windsor

COMPUTE ONTARIO COLLABORATIVE TRAINING INITIATIVES

Community Developed Learning Resources: Research Software

- Stewarding research software from proposal to deposit and publication, *McMaster University*
- Applying technologies such as computational notebooks and open application programming interfaces to facilitate and support open research, *McMaster University*



COMPUTE ONTARIO COLLABORATIVE TRAINING INITIATIVES

Compute Ontario Summer School

- Bioinformatics: Analysis of RNA-sequencing Data
- Overview of training opportunities in the School and beyond
- Interactive Computing with Open OnDemand
- AI Showcase
- Bioinformatics: Long-read Sequencing Applications
- Introduction to Single cell RNA sequencing and analysis
- Introduction to Advanced Research Computing
- Profiling AI Software with Pytorch Profiler+Nsight Systems
- Introduction to Python
- Introduction of R Shiny



COMPUTE ONTARIO COLLABORATIVE TRAINING INITIATIVES

[Compute Ontario Summer School](#)

- High Performance Rapid Prototyping in Biological Sequence Analysis
- Bioinformatics for Pathway Enrichment Analysis
- Fortran as a Second Language
- Introduction to Linux shell
- Multicore Parallel Programming with OpenMP
- Introduction to R
- An Introduction to Open Foam
- System Security-Defensive Techniques
- Extracting Information from Health Data Using AI
- Reproducible Research: Practices and Tools



COMPUTE ONTARIO COLLABORATIVE TRAINING INITIATIVES

[Compute Ontario Summer School](#)

- Data security
- Leveraging Large Language Models for Academic Research
- C as a Second Language
- From Policy to Practice: Preparing for the Data Depsoit Requirement of the Tri-Agency RDM Policy
- REBs and DRI
- Indigenous Data Sovereignty in practice: The Supporting Indigenous Language Revitalization (SILR) Caretaking Directives
- Introduction to Alliance RDM Services
- Introduction to Version control (Git)



COMPUTE ONTARIO COLLABORATIVE TRAINING INITIATIVES

[Compute Ontario Summer School](#)

- Introduction to Data Curation and Deposit
- Using Odesi & Scholars GeoPortal for research discovery, exploration, and reuse
- DASK
- Text Mining in the Context of LLMs
- High Performance Computing in Python
- From Raw Data to Results: No Terminal Required with UseGalaxy.ca
- Introduction to data deposit and sharing in Borealis, the Canadian Dataverse Repository
- Scaling Up HPC Workflows
- Incorporating Other Languages into Python



COMPUTE ONTARIO COLLABORATIVE TRAINING INITIATIVES

Compute Ontario Summer School

- C++26 and HPC
- Machine learning
- Introduction to Neural Network Programming
- Programming GPUs with CUDA
- Introduction to Julia
- TDM at the University of Toronto Libraries: Services and Platforms
- Exploring the intersection of AI Copyright and RDM in the Canadian Context
- Scientific Visualization with ParaView
- Using Apptainer Containers
- Data Preparation for Machine Learning





TRAINING: GETTING STARTED

New User Courses

SHARCNET: [New User Course](#)

SciNet: [Intro to SciNet and Trillium](#)

Community Developed Resource: [Introduction to advanced research computing using Digital Research Alliance of Canada resources](#), *Carleton University*



TRAINING: GETTING STARTED

Examples of Introductory DRI Courses

[SHARCNET: Fundamentals and practice of advanced research computing](#)

[SHARCNET: Mastering the Alliance Job Scheduler](#)

[SciNet: Introduction to supercomputing](#)

CAC: Introduction to High-Performance Computing (HPC)

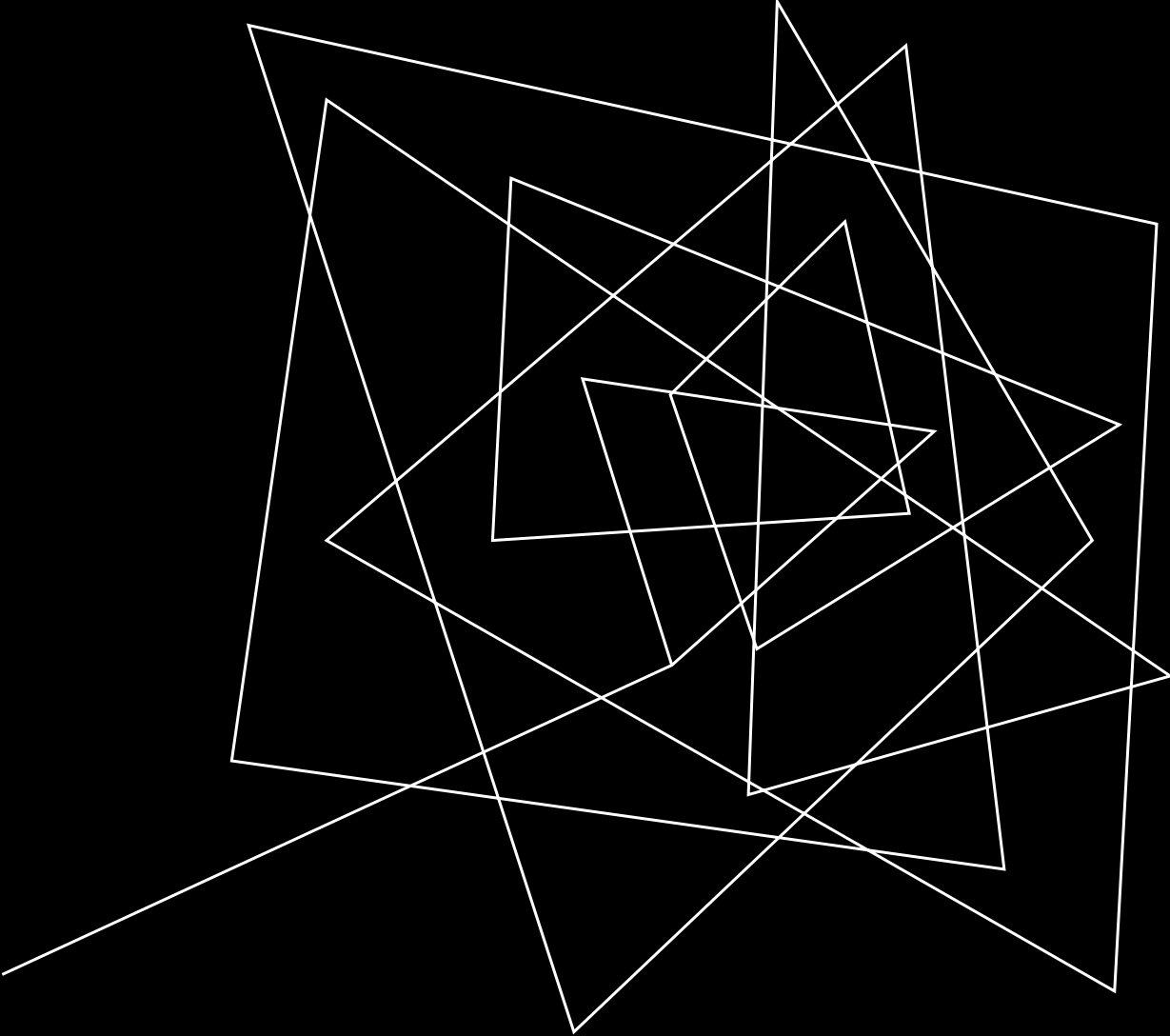
HPC4Health: Research Data Management (RDM): best practices

Community Developed Resource: [Research data management in the college and small institution context](#), *Heads of Applied Research and the Ontario Colleges RDM Community of Practice*

COSS: [Introduction to Advanced Research Computing](#)

COSS: [Overview of training opportunities in the School and beyond](#)

Community Developed Resource: [Research Data Management \(RDM\) knowledge, skills, tools and best practices](#), *Canadian Bioinformatics Workshops, Ontario Institute for Cancer Research, McGill University, Pan-Canadian Genome Library*



EXPLORA

- National Training Discovery Portal
- DRI training from providers all over the country
- Includes Events and materials

DEMO

- Events
 - Mode of event, abstract, link to event, provider, time of event, language of event
- Filters
- Subscribe to Events
- List vs Calendar view
- Materials
- Collections

REFERENCES

- Centre for Computational Medicine. (2026). *Bioinformatics training*. The Hospital for Sick Children (SickKids). <https://ccm.sickkids.ca/bioinformatics-training/>
- Compute Ontario. (n.d.). *What is digital research infrastructure?* <https://www.computeontario.ca/what-is-dri>
- Digital Research Alliance of Canada. (n.d.). *Accessing advanced research computing resources*. <https://www.alliancecan.ca/en/our-services/advanced-research-computing/accessing-advanced-research-computing-resources>
- Digital Research Alliance of Canada. (2026, September 2). *User roles to access resources and services of the Alliance Federation*. https://docs.alliancecan.ca/wiki/User_roles_to_access_resources_and_services_of_the_Alliance_Federation
- Gruenpeter, M., Katz, D. S., Lamprecht, A.-L., Honeyman, T., Garijo, D., Struck, A., Niehues, A., Martinez, P. A., Castro, L. J., Rabemanantsoa, T., Chue Hong, N. P., Martinez-Ortiz, C., Sesink, L., Liffers, M., Fouilloux, A. C., Erdmann, C., Peroni, S., Martinez Lavanchy, P., Todorov, I., & Sinha, M. (2021). *Defining research software: A controversial discussion* (Version 1). Zenodo. <https://doi.org/10.5281/zenodo.5504016>
- Government of Canada. (2026, May 28). *Research data management*. <https://science.gc.ca/site/science/en/interagency-research-funding/policies-and-guidelines/research-data-management>
- NetApp. (n.d.). *What is high-performance computing (HPC)?* <https://www.netapp.com/data-storage/high-performance-computing/what-is-hpc/>
- SHARCNET. (n.d.). Events calendar [Screenshot]. <https://www.sharcnet.ca/my/news/calendar>

A series of white, overlapping geometric lines and polygons on a black background, located on the left side of the slide.

QUESTIONS?

CONTACT: ANN ALLAN
ANN.ALLAN@COMPUTEONTARIO.CA