

ORION: The Digital Foundation Behind Ontario's Discoveries

Every day, researchers and innovators in Ontario are advancing cancer treatment, probing the origins of the universe, unlocking genomic insights, and responding to global health challenges. Supporting this work is ORION, a not-for-profit organization that empowers world-class research, education, and innovation across the province. From universities and colleges to teaching hospitals and quantum institutes, ORION provides the shared digital infrastructure that helps improve lives, strengthen public systems, and position Ontario as a global leader.

Built for public institutions, ORION's private network further strengthens Canada's capacity in digital sovereignty, AI research, and data-intensive discovery. It enables researchers and educators to securely manage sensitive data, run advanced workloads, and collaborate at scale across Ontario and beyond. Through its community-governed model, ORION provides the resilient digital foundation needed to advance innovation, protect critical research, and reinforce Canada's long-term capacity to compete and lead.

Innovation That Changes What's Possible

Ontario's research and education community relies on ORION to transfer data, collaborate globally in real time, and operate at a scale no single institution could sustain on its own. With dedicated, high-performance connectivity, institutions can pursue new breakthroughs that are not feasible on standard public internet services. Examples of work enabled by ORION include:

Advancing Cancer Care and Clinical Research

At teaching and medical hospitals across the province, researchers depend on ORION to securely move sensitive clinical and imaging data, collaborate with partners across Ontario, and accelerate progress in cancer diagnosis, treatment, and patient outcomes.

Exploring the Universe: From Astrophysics to Neutrinos

Research institutions and computing centres use ORION's ultra-high-capacity connectivity to support theoretical astrophysics, particle physics, and neutrino research—moving enormous datasets between facilities, supercomputing centres, and international collaborators.

Powering Quantum Research

Ontario's growing quantum research ecosystem depends on low-latency, high-performance connectivity. ORION enables real-time collaboration between researchers, experimental facilities, and global partners advancing next-generation computing.

Genomics at Scale

Genome sequencing and bioinformatics generate vast volumes of data. ORION allows researchers to rapidly share datasets, integrate with national and international platforms, and turn raw data into insights to advance precision medicine.

Responding to Global Health Challenges

During the COVID-19 pandemic, ORION enabled rapid collaboration, data sharing, and business continuity across Ontario's research and education sector—highlighting the critical role of resilient digital infrastructure in times of crisis.

Impact and Value at Scale

- 90+ connected institutions
- 400 Gbps network capacity
- 6,000+ km of fibre
- 1.7 million researchers and educators
- 102,000+ jobs
- \$10+ billion in annual economic contribution

Delivering Public Outcomes that Matter for Ontario

As a provincial platform for discovery, learning, and collaboration, ORION supports our community by:

- **Accelerating research and discovery** by enhancing access to advanced computing, large datasets, and global collaborators
- **Strengthening education and skills development** from urban campuses to remote and regional communities
- **Improving healthcare collaboration** through secure, high-fidelity clinical and research data sharing
- **Boosting economic competitiveness** by enabling innovation and high-value jobs across Ontario's knowledge economy

The Digital Foundation Behind Ontario's Discoveries

As a community-governed organization, ORION provides high-capacity digital infrastructure that institutions rely on to collaborate, share resources, and operate on a global level. Decisions are guided by the needs of the institutions we serve, ensuring long-term sustainability, accountability, and value.

Unlike commercial networks, ORION is purpose-built to deliver:

- **Advanced workloads at scale:** High-bandwidth, low-latency connectivity supporting AI, genomics, physics, and other data-intensive research
- **Collaboration at provincial and global scale:** Direct connections to national and international research and education networks
- **Secure internet access for researchers and educators:** Access to eduroam provides Wi-Fi connectivity at thousands of locations in more than 100 countries
- **Secure handling of sensitive data:** Infrastructure designed to protect personal data with confidence
- **Built-in security and resilience:** Upgraded routing to reduce network hijacking risks and enhance protection
- **Resilience that reduces institutional risk:** Proactive monitoring and expanded DDoS protection helped prevent more than 100 attacks in the past year before they impacted institutions
- **Sector leadership in cybersecurity:** ORION leads community-driven initiatives like the Ontario Cybersecurity Higher Education Consortium (ON-CHEC) program to strengthen collective digital resilience
- **Governance aligned with public outcomes:** A not-for-profit model focused on long-term value and not short-term profit

Join the Network Behind Ontario's Breakthroughs

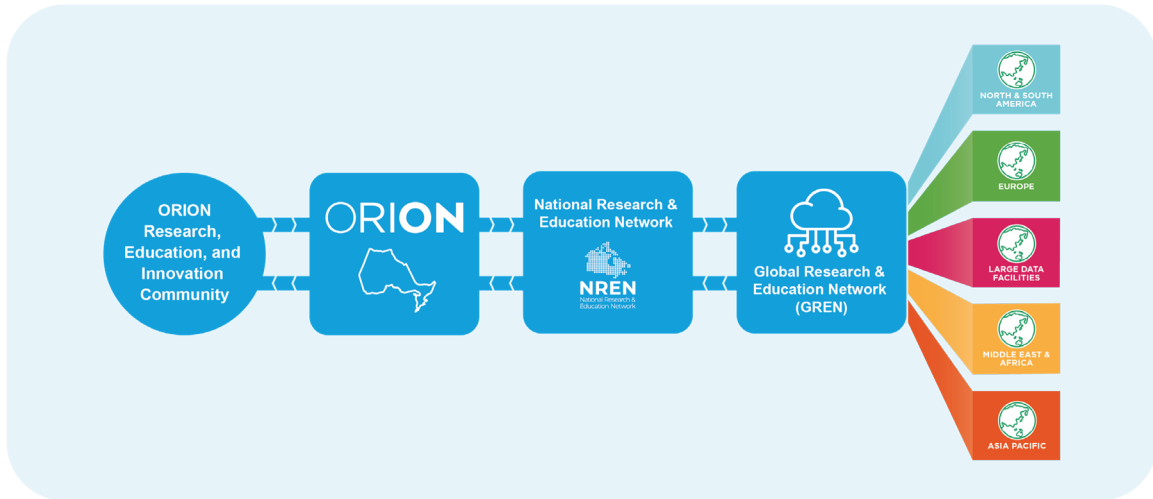
ORION provides the trusted digital foundation that enables Ontario's institutions to advance life-changing research, educate the next generation, and deliver lasting public value. Designed for scale, governed by the community, and built for impact, ORION empowers innovation today and into the future.

To learn more, visit orion.on.ca or connect with our Community Engagement team at communitydev@orion.on.ca.

Transformative Connectivity for Discovery and Collaboration

As Ontario's partner in Canada's National Research and Education Network (NREN)—a distinctive alliance of provincial and territorial networks—ORION extends the reach of Ontario's research, education, and innovation community.

This partnership empowers institutions to connect with peers nationwide and globally, leveraging dedicated, high-performance connectivity to move data at scale, access essential national platforms, and collaborate securely both across Canada and internationally. Such capabilities are now indispensable in advancing data-intensive research and in competing for leading research funding.



High-Speed and Secure Data Transfer

With ultra-fast connections, ORION enables rapid movement of massive datasets, supporting discovery, collaboration, and knowledge sharing without being constrained by typical connectivity limitations.

For context, transferring 10TB of data—the equivalent of sequencing 15,000 human genomes or roughly 200 hours of 4K video—takes just six minutes at 100Gbps. On standard home internet, that same transfer could take up to 18 days.

HOW FAST IS FAST?

ORION has achieved network speeds exceeding **1 Terabit** per second allowing our research and education community access speeds of up to **100 Gigabits** per second.

What is **1 Terabit** per second?

- 125GB** every second or **125,000** 1MB emails/sec
- 1,000X** faster than commercially available HIGH-SPEED SERVICES
- 4 Terabit** genome file transferred in **4 SEC WITH ORION** vs >1 hour at 100 Gbps