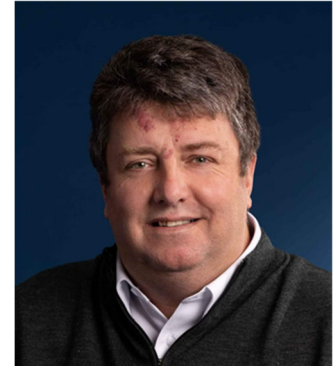


High-power laser science at the Advanced Laser Light Source (ALLS)

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Abstract

The Advanced Laser Light Source (ALLS) is a unique user facility located at INRS-EMT (Varennnes, Canada) counting on 40M CDN\$ of investment since 2002. Since 2019, this facility has joined the LaserNetUS network and is now funded as a national research infrastructure by the Canada Foundation for Innovation – Major Science Initiatives. These fundings ease access to the facility for academic and government users. In the first part of my talk, I will give an overview of the facility's capabilities including the most powerful laser in Canada with 750 TW. In the second part, I will discuss recent results on electron acceleration under tight focusing [1] and for high dose-rate of MeV electron beam from ambient air [2], as well as a high flux neutron beamline based on laser wakefield acceleration of electrons [3].

References

- [1] J. Powell et al. *Phys. Rev. Lett.* **133**, 155001 (2024).
- [2] S. Vallières et al. *Laser Photonics Rev.* **18**, 2300078 (2024).
- [3] S. Vallières et al. *Nature Comm.* **16**, 11498 (2025).