

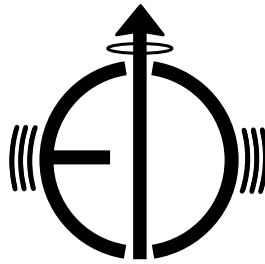
Application for Membership in the ePIC Detector Collaboration

David Hornidge, *Mount Allison University*

ePIC Collaboration Council

April 4, 2025

MountAllison
UNIVERSITY



New Brunswick, CANADA



New Brunswick

Population: 840,000

Area: 72,908 km²

English and French

Lobster, Lumber, and High Tides



Sackville, NB

- Population 6,000 + students
- Latitude 46° N

Mount Allison University

- 2,500 students
- Undergrads only

D. Hornidge

The MTA Group

David Hornidge

- **PhD** — Saskatchewan Accelerator Laboratory, Saskatoon, SK, advisor Dennis Skopik, completed in 1999.
- **PDF** — Institute for Nuclear Physics, Mainz, Germany, supervisor Reinhard Beck, 1999–2003.
- **Professor** — Mount Allison University 2003–present

Usually about 4-6 undergraduate student researchers every summer.

1-2 honours thesis students each academic year.

We also shared a PDF with Mainz from 2009–23.

Co-supervised 4 PhD students.

Research Interests

Hadron Structure

- Nucleon and pion polarizabilities
- Threshold meson photoproduction
- Nuclear Astrophysics
- Exotic Mesons

Collaborations

- CB-TAPS and A2 Collaboration at Mainz (since 1999)
- EIC Canada (since 2020)
- HIGS at Duke/TUNL (since 2021)
- GlueX at Hall D JLab (since 2021)

Expertise

- Data analysis
- Simulations

Canadian Interests/Contributions at the EIC

- **π and K Form-Factor Studies**
- **XYZ Spectroscopy**
- Extend Studies of Leptoquark sensitivity
- PVES to determine interference structure functions
- Machine Learning for calorimeter design optimization
- Compton polarimetry
- HV-MAPS electron detector
- **BIC**

Expected MTA Contributions

Contribute to the general EIC CANADA Collaboration efforts.

Assisting with BIC R&D and experiment feasibility studies.

- MTA undergrads (**1-2 per year**) will contribute to EIC Canada research in a supporting role with smaller hardware and software tasks.
- For example, light-guide and optical cookie transmission testing, SiPM testing, LED light monitoring testing, etc.
- Simulations and detailed event reconstruction with the forward detectors.

The hope is that the best students will then continue on a graduate students in the EIC Canada Collaboration...

Expected MTA Contributions

M. Kerr, B.Sc. honours student, graduated in May 2024.

Presently a physics graduate student at MIT.

Worked with the Regina group (Papandreou) on Baby BCAL studies.

- Gain calibrations.
- Energy resolution.
- # of photoelectrons.

I foresee future undergrads continuing similar work with the Regina, Manitoba, and possibly TRIUMF groups.