

Jan Christopher Bernauer

Nuclear Physicist

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EXPERIENCE

- since Sep. 2024 **Associate Professor**, *Stony Brook University*, Stony Brook, USA.
since Sep. 2018 **Research Affiliate**, *MIT*, Cambridge, USA.
Sep. 2018 to **Assistant Professor**, *Stony Brook University*, Stony Brook, USA.
Sep. 2024
Sep. 2018 to **RIKEN BNL Research Center Fellow**, *RIKEN BNL Research Center*,
Sep. 2023 Upton, NY, USA.
October 2014 to **Research Scientist**, *MIT*, Cambridge, USA.
August 2018
July 2012 to **Senior Postdoctoral Associate**, *MIT*, Cambridge, USA.
October 2014
May 2010 to **Postdoctoral Associate**, *MIT*, Cambridge, USA / Hamburg, Germany.
July 2012
January 2005 to **Wissenschaftlicher Mitarbeiter (Research Assistant)**, *Johannes*
April 2010 *Gutenberg-University*, Mainz, Germany.

EDUCATION

- September 2010 **Ph.D. in Nuclear Physics**, *Johannes Gutenberg-University*, Mainz, Germany, Magna cum laude.
Advisor: Thomas Walcher.
Measurement of the elastic electron-proton cross section and separation of the form factors G_E and G_M in the Q^2 region between $0.002 (\text{GeV}/c)^2$ and $1 (\text{GeV}/c)^2$. The work is supported by the CRC/SFB 443. I contributed substantially to the corresponding part of the CRC continuation application and was the main author of the experiment proposal which was given the highest rating by the PAC in 2005.

September 2004 **Diplom Physik**, *Johannes Gutenberg-University*, Mainz, Germany, mit Auszeichnung bestanden (passed with distinction).
Advisor: Jörg Friedrich.
Preparations for a high precision measurement of the electric and magnetic form factor of protons.

MEMBERSHIPS

since 2003 German Physical Society DPG (Unit: HK)
since 2013 American Physical Society APS (Units: DNP, FIP, FPS, GHP, SNES)

PRIZES

2024 **Outstanding Faculty Award**, *Department of Physics and Astronomy, Stony Brook University*.
2017 **Infinite Kilometer Award**, *School of Science, MIT*.

SELECTED PRESENTATIONS

March 2023 **Precision scattering experiments – From form factors to dark matter**, *ELPH Seminar*, Research Center for Electron Photon Science, Tohoku University, Sendai, Japan.

October 2022 **ERLs for precision measurements on fixed targets**, *International Workshop on Energy Recovery Linacs ERL2022*, Ithaca, NY, USA.

June 2022 **The proton radius from electron scattering measurements (and other thoughts about form factors)**, *PREN2022 Convention: International STRONG-2020 Workshop on the Proton Charge Radius and related topics*, Paris, France.

April 2021 **DarkLight@ARIEL: A search for new physics with invariant mass between 10 and 20 MeV**, *TRIUMF Colloquium*, TRIUMF, Vancouver, BC, Canada.

September 2019 **The proton radius puzzle - (almost) 10 years later**, *XIX International conference on Science, Arts and Culture: The Proton Radius*, Veli Losinj, Croatia.

September 2018 **Two-Photon exchange in elastic lepton-proton scattering**, *Chiral Dynamics 2018*, Durham, NC, USA.

February 2018 **Die MAMI/A1 Proton Formfaktor Messung**, *Special symposium “50 years of experiments with accelerators in Mainz”*, Mainz, Germany.

SELECTED PUBLICATIONS

Peer-reviewed Articles

- [1] V.D. Burkert, L. Elouadrhiri, A. Afanasev, et al. **Precision Studies of QCD in the Low Energy Domain of the EIC.** *Progress in Particle and Nuclear Physics*, 131:104032, 2023. doi: 10.1016/j.ppnp.2023.104032.
- [2] J.C. Bernauer, C.T. Dean, C. Fanelli, et al. **Scientific Computing Plan for the ECCE Detector at the Electron Ion Collider.** *Nucl. Instrum. Meth. A*, 1047:167859, 2023. doi: 10.1016/j.nima.2022.167859.
- [3] Jan Bernauer, Ross Corliss, Susan Gardner, et al. **Scientific Opportunities at the ARIEL Electron Linac.** *J. Phys.: Conf. Ser.*, 2391(1):012001, 2022. doi: 10.1088/1742-6596/2391/1/012001.
- [4] E. Cline, R. Corliss, J. C. Bernauer, et al. **Searching for New Physics with DarkLight at the ARIEL Electron-Linac.** *J. Phys.: Conf. Ser.*, 2391(1):012010, 2022. doi: 10.1088/1742-6596/2391/1/012010.
- [5] Y. Wang, J. C. Bernauer, B. S. Schlimme, et al. **Low- Q^2 Elastic Electron-Proton Scattering Using a Gas Jet Target.** *Phys. Rev. C*, 106(4):044610, 2022. doi: 10.1103/PhysRevC.106.044610.
- [6] R. Abdul Khalek, A. Accardi, J. Adam, et al. **Science Requirements and Detector Concepts for the Electron-Ion Collider.** *Nuclear Physics A*, 1026:122447, 2022. doi: 10.1016/j.nuclphysa.2022.122447.
- [7] E. Cline, W. Lin, P. Roy, et al. **Characterization of Muon and Electron Beams in the Paul Scherrer Institute PiM1 Channel for the MUSE Experiment.** *Phys. Rev. C*, 105(5):055201, 2022. doi: 10.1103/PhysRevC.105.055201.
- [8] Ethan Cline, Jan C. Bernauer, and Axel Schmidt. **Direct TPE Measurement via e^+p/e^-p Scattering at Low ε in Hall A.** *Eur. Phys. J. A*, 57(10):290, 2021. doi: 10.1140/epja/s10050-021-00597-3.
- [9] Ethan Cline, Jan Bernauer, Evangeline J. Downie, and Ronald Gilman. **MUSE: The MUon Scattering Experiment.** *SciPost Phys. Proc.*, 5:023, 2021. doi: 10.21468/SciPostPhysProc.5.023.
- [10] A. Accardi, A. Afanasev, I. Albayrak, et al. **An Experimental Program with High Duty-Cycle Polarized and Unpolarized Positron Beams at Jefferson Lab.** *Eur. Phys. J. A*, 57(8):261, 2021. doi: 10.1140/epja/s10050-021-00564-y.
- [11] J. C. Bernauer, A. Schmidt, B. S. Henderson, et al. **Measurement of the Charge-Averaged Elastic Lepton-Proton Scattering Cross Section by the OLYMPUS Experiment.** *Phys. Rev. Lett.*, 126(16):162501, 2021. doi: 10.1103/PhysRevLett.126.162501.
- [12] M. Mihovilovič, P. Achenbach, T. Beranek, et al. **The Proton Charge Radius Extracted from the Initial-State Radiation Experiment at MAMI.** *Eur. Phys. J. A*, 57(3):107, 2021. doi: 10.1140/epja/s10050-021-00414-x.

- [13] J. Beričić, L. Correa, M. Benali, et al. **New Insight in the Q^2 Dependence of Proton Generalized Polarizabilities.** *Phys. Rev. Lett.*, 123(19):192302, 2019. doi: 10.1103/PhysRevLett.123.192302.
- [14] M. Mihovilović, A.B. Weber, P. Achenbach, et al. **First Measurement of Proton's Charge Form Factor at Very Low Q^2 with Initial State Radiation.** *Physics Letters B*, 771:194–198, 2017. doi: 10.1016/j.physletb.2017.05.031.
- [15] J. C. Bernauer, M. O. Distler, J. Friedrich, et al. **Electric and Magnetic Form Factors of the Proton.** *Phys. Rev. C*, 90(1):015206, 2014. doi: 10.1103/PhysRevC.90.015206.
- [16] H. Merkel, P. Achenbach, C. Ayerbe Gayoso, et al. **Search at the Mainz Microtron for Light Massive Gauge Bosons Relevant for the Muon $g - 2$ Anomaly.** *Phys. Rev. Lett.*, 112(22):221802, 2014. doi: 10.1103/PhysRevLett.112.221802.
- [17] B. S. Schlimme, P. Achenbach, C. A. Ayerbe Gayoso, et al. **Measurement of the Neutron Electric to Magnetic Form Factor Ratio at $Q^2 = 1.58\text{GeV}^2$ Using the Reaction ${}^3\vec{H}e(\vec{e}, e'n)pp$.** *Phys. Rev. Lett.*, 111(13):132504, 2013. doi: 10.1103/PhysRevLett.111.132504.
- [18] H. Merkel, P. Achenbach, C. Ayerbe Gayoso, et al. **Search for Light Gauge Bosons of the Dark Sector at the Mainz Microtron.** *Phys. Rev. Lett.*, 106(25):251802, 2011. doi: 10.1103/PhysRevLett.106.251802.
- [19] P. Achenbach, C. Ayerbe Gayoso, J.C. Bernauer, et al. **Particle Tracking in Kaon Electroproduction with Cathode-Charge Sampling in Multi-Wire Proportional Chambers.** *Nucl. Instrum. Meth. A*, 641(1):105–113, 2011. doi: 10.1016/j.nima.2011.03.039.
- [20] J. C. Bernauer, P. Achenbach, C. Ayerbe Gayoso, et al. **High-Precision Determination of the Electric and Magnetic Form Factors of the Proton.** *Phys. Rev. Lett.*, 105(24):242001, 2010. doi: 10.1103/PhysRevLett.105.242001.