Jason Bane
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Dear Dr. Camillo Mariani,

Completing my research at Jefferson Lab for the last 5 years has afforded me the opportunity to gain an immense amount of experience with electron scattering experiments. My work with the MARATHON, APEX, and Argon(e',p) experiments have honed my skills and knowledge in experimental physics. This experience will make me a prime candidate to use data from Jefferson Lab to construct nuclear models.

My work at Jefferson Lab has allowed me to work on many aspects of an experiment. I was able to work on the refurbishment and maintenance of the BigBite Spectrometer for the MARATHON experiment. Preparing this spectrometer gave me the opportunity to gain experience in the design and construction of the front end electronics including designing and testing of a logic trigger. I continued my work with BigBite by contributing to the refurbishing of individual detectors in the spectrometer and erecting the data acquisition system. I assisted in the preparation of analysis software for the three different experiments. During the Argon, MARATHON, and APEX experiments, I helped maintain the online analysis software and replay scripts. Using the analysis software and replayed data, I calibrated parts of the detectors, focusing on the beam position monitors and adc signals from the cherenkov and calorimeters. Working with these experiments and their collaborators allowed me to work with large numbers of students, postdocs and other scientists. Working with such a vast group of scientist developed my skills in communication and collaboration. Being a part of these large collaborations have advanced my abilities in discussion, presenting, and collaborating. As part of my Ph.D., I have been analyzing MARATHON data. Part of my analysis task has been to compare data results to simulated data. In order to simulate data, I have had to work closely with cross section models and simulation packages. Completing this analysis has granted me the ability to learn different coding languages like C++, fortran, ROOT, and python.

The knowledge I have gained working at Jefferson Lab would make me a great fit for this postdoc at Virginia Tech. My previous work with the Hall A analysis software and programming languages would allow me to quickly analyze Hall A data. My experience in large collaborations will contribute to supervising and coordinating with other scientists. My familiarity with coding languages and simulation packages will help me develop nuclear models for neutrino interactions.

As part of my application, I am attaching three documents to fulfill the application request. This one which contains a cover letter and a CV. A document that contains my research statement and hardware experience. The last document contains a list of references, a list of publications, and a list of presentations.

Thank you for your time and attention,
Jason Bane

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Experience

- **University of Tennessee, Department of Physics and Astronomy** **Knoxville, TN,**
  Graduate Research Assistant *May 2014 – Present*
  - Designed and constructed front end electrons for an electron spectrometer.
  - Created module layouts and cable maps for efficient reuse of products.
  - Tested high voltage cards and laid high voltage cable for an electron spectrometer.
  - Used Oscilloscopes to test signals, debug logic modules, and map out inconsistent signals.
  - Maintained and refurbished individual detector components of a spectrometer including checking the quality of Photo Multiplier Tubes and plastic scintillators.
  - Calibrated detectors and used online analysis tools in java to control the quality of data during an experiment.
  - Performed analysis on a large set of data involving multiple nuclear targets using Python, C++ , ROOT, and fortran.
  - Instructed new researchers on the use of hardware and software used in the field
- **University of Tennessee, Department of Physics and Astronomy** **Knoxville, TN,**
  Graduate Teaching Assistant *August 2012 – May 2015*
  - Designed and implemented observational and planetarium based astronomy labs.
  - Educated students on the use of refracting telescopes and equatorial mounts.
  - Instructed students in laboratory exercises to help conceptualize physics topics.
  - Tutored students for homework assistance and test prep.
- **Clay County Tennessee Education Department** **Celina, TN**
  Secondary Educator & Football Coach *August 2010 – May 2012*
  - Created lesson plans that included interactive, creative thinking, and discussion driven curriculum for a diverse body of geometry students.
  - Constructed lessons that used hands-on lab activities, demonstrations, and interactive computer lessons to instruct high school Juniors and Seniors in algebra-based physics.
  - Used discussion-based problem-solving lessons to help remedial math students to improve their algebra, geometry and trigonometry skills for post-secondary education.
  - Provided an equitable and inclusive atmosphere for diverse students.
  - Math and reading focused tutoring.

Education

- **University of Tennessee** **Knoxville , TN**
  Ph.D. in Nuclear Physics *August 2012 – Planned December 2019*
- **University of Tennessee** **Knoxville , TN**
  Secondary Education Certification in Math and Science *August 2009 – May 2010*
- **University of Tennessee** **Knoxville , TN**
  Bachelor of Science , Physics & Minor in Education *August 2004 – May 2009*

Core Technical Skills

Languages: C, C++, LaTeX, Python, shell script, SQL
Example scipts located at https://github.com/jbane11/examples
Software: Microsoft office, Libre Office, Texstudio, vim, atom
Operating Systems: Linux(Red Hat), Windows, MacOS

Publications

- H. Dai, [et al. including **J. Bane**], "First Measurement of the Ar(e,e')X Cross Section at Jefferson Lab," Phys. Rev. C 99, 054608 May 2019
- R. Cruz-Torres, [et al. including **J. Bane**], "Comparing proton momentum distributions in A=3 nuclei via ^{3}He and ^3H(e,e'p) measurements," in preparation, (2019)
- S. N. Santiesteban, S. Alsalmi, D. Meekins, **J. Bane,** et al., "Density Changes in Low Pressure Gas Targets for Electron Scattering Experiments" in preparation (2018)
- H. Dai, [et al. including **J. Bane**], "First Measurement of the Ti(e,e')X Cross Section at Jefferson Lab," Phys. Rev. C 98, 014617 July 2018
- P V. Pandey, [et al. including **J. Bane**], "Probing electron-argon scattering for liquid-argon based neutrino-oscillation program," preprint arXiv:1711.01671

Honors

- Jefferson science associates graduate fellowship award (2018)
- Chancellor's honors for extraordinary professional promise (2016)
- DOE office of science graduate student research program award (2015)
- Dean's List 2009 Academic Year (2010)

Conference Presentations

- "EMC in A=3 from MARATHON," 2nd Workshop on Quantitative Challenges in SRC and EMC Research, MIT, Cambridge MA, March 2019
- "Ratios in A=3 nuclei from MARATHON ," American Physical Society's Division of Nuclear Physics' yearly meeting, HA, October 2018
- "Measurement of the spectral function of Argon and Titanium through the(e,e'p) reaction," American Physical Society's Division of Nuclear Physics' yearly meeting, HA, October 2018
- "Status of the MARATHON experiment." American Physical Society's Division of Nuclear Physics' yearly meeting, Pittsburgh PA, October 2017
- "Searching for the Origin of the EMC effect." American Physical Society's Division of Nuclear Physics' yearly meeting, Sante Fe NM, October 2016

Poster Presentations

- "The impetus in the EMC effect, a EMC simulation." Gordon Research Conferences, Holderness, NH. August 2018
- "Searching for the Origin of the EMC effect." SURA Board of Trustees Meeting, Newport News, VA. April 2018

References

Nadia Fomin, Professor
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Mellisa White, Teacher, Principal
Clay Count Board of Education
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Evan McClellan, Post-doctoral Fellow
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Interests

Football, coaching, game programing, boating, and traveling