MATHEW M. POTTS

RESEARCH SCIENTIST

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EDUCATION

Doctorate of Philosophy, *Physics*	May 2021 – May 2022
Master of Science, *Physics*	Aug. 2017 – May 2021
Bachelor of Science, *Physics*	Aug. 2015 – Aug. 2017

University of Utah, Salt Lake City, Utah

SKILLS

Programming languages: Python, Java, C, C++, R, CERN ROOT, MATLAB, Mathematica, LabVIEW

Markup Languages: HTML, CSS, LaTeX

Linkedin Skill Badges: Angular, React.js, Google Cloud Platform, Java, Microsoft Azure, Amazon Web Services, Machine Learning, Python

Miscellaneous: Strong analytical problem-solving experience, excellent verbal and written communication skills, and great in collaborative environments.

TEACHING EXPERIENCE

University of Utah	Aug. 2017 – May 2019

Teacher Assistant

- Create lesson plans for in class discussion
- Help students overcome misunderstandings

Totally Tutoring	May 2014 – June, 2015

Contracted Tutor

- Tutored physics, mathematics, and chemistry
- Created take home assignments and short lesson plans

RESEARCH EXPERIENCE

Neutrino Research	May 2022 – Oct. 2023

Trinity Neutrino Observatory and EUSO-SPB2

Department of Physics, Georgia Institute of Technology

Postdoctoral Research Fellow

- Designed the remote observation procedures, software, and hardware for the Trinity Demonstrator telescope.

- Built and tested all aspects of the Trinity Demonstrator telescope.
- Designed and tested the cooling system for the Cherenkov telescope of the EUSO-SPB2 experiment.
- Performed simulation using CORSIKA, GrOptics, and C++ in order to analyze the performance of the full Trinity Observatory and Demonstrator telescope.

Cosmic Rays Research   Aug. 2015 – Sept. 2023

The Telescope Array (TA) Cosmic Ray Observatory
Department of Physics and Astronomy, University of Utah
Research Advisor: Charles Jui
Thesis: Ultra-high Energy Cosmic Ray Energy Spectrum using Hybrid Analysis with TAx4

- Analyzed the data for the new TA expansion, TAx4, to calculate the energy spectrum of ultra-high energy cosmic rays using hybrid detection.
- Maintained and operated surface and fluorescence detectors for cosmic ray data collection.
- Linux systems administrator of the Telescope Array's data server and computational cluster at the University of Utah.
- Analyzed fluorescence detector's sensitivity to energy and development of cosmic ray interactions in the atmosphere through Monte Carlo simulation. The reconstructed information was analyzed by binning parameters into histograms and fitted using CERN's ROOT data analysis framework.

Accelerator Research   Aug. 2015 – May 2023

sFLASH Collaboration
Stanford Linear Accelerator Center, National Accelerator Laboratory 0

- Performed two experiments in 2016 and 2018 aimed at measuring the air fluorescence yield at Stanford Linear Accelerator Center. The air fluorescence yield is a important quantity in determining how much light is produced in cosmic ray air showers.
- Performed photo-multiplier tube calibration with a UV LED diode.
- I assisted in taking the data when the beam was running and was in charge of keeping an experimental log of each data run.
- Analyzed beam run data to find 'golden runs', runs where the beam energy was stable.

Astronomy Research   Aug. 2014 – May 2015

Salt Lake Community College, Salt Lake City, Utah
Research Advisor: Jonathan Barnes
Senior Project: A Closer Look at the KOI-22 Light Curve

- Examined the Kepler exoplanet data to see if we could find evidence of precession in the light curves of "Hot Jupiter" systems that could hint at additional exoplanets.
- Found a trend in the difference of the orbital times of KOI-22 which repeated every sixty-two orbits. This may suggest that a body is perturbing its orbit slightly.

PUBLICATIONS

- M. Potts and C. Jui (TA Collaboration). *Monocular Energy Spectrum using the TAx4 Fluorescence Detector*. Proceedings of Science (ICRC2021) 343.
- R.U. Abbasi et al. (TA Collaboration). *Surface detectors of the TAx4 experiment*. Nuclear Inst. and Methods in Physics Research (2021).
- R.U. Abbasi et al. (TA Collaboration). *Observations of the Origin of Downward Terrestrial Gamma-Ray Flashes*. Journal of Geophysical Research: Atmospheres 123 (2018).
- S. Atwood et al. (sFLASH Collaboration). *The Instruments of sFLASH experiment*. Proceeding of Science (ICRC2017) 407.

CONFERENCES/TALKS

- M. Potts. *Progress on Trinity an IACT searching for UHE Neutrinos*. APS April Meeting; 2023, Seminar talk.
- M. Potts. *Trinity: UHE Earth-skimming Neutrino Detector.* P5 Town Hall at Fermilab and Argonne; 2023, Seminar talk.
- M. Potts. *Ultra-High Energy Cosmic Ray Energy Spectrum using Hybrid Analysis with TAx4*. APS April Meeting; 2022, Seminar talk.
- M. Potts. *Ultra-High Energy Spectrum using Hybrid Analysis with TAx4*. Los Alamos National Lab/Stanford Linear Accelerator Center; 2021, Seminar talk.
- M. Potts. *Ultra-High Energy Spectrum using Hybrid Analysis with TAx4*. Georgia Tech; 2021, Undergraduate Seminar.
- M. Potts on behalf of TA. *Monocular Energy Spectrum using the TAx4 Fluorescence Detector*. ICRC(2021).
- M. Potts on behalf of TA. *TAx4 Cosmic Ray Energy Spectrum*. University of Utah; 2020, Research Symposium.
- M. Potts and Jonathan Barnes. *A Closer Look at the KOI-22 Light Curve*. Research Symposium, Salt Lake Community College, Salt Lake City, UT, 2015
- M. Potts and Jonathan Barnes. *A Closer Look at the KOI-22 Light Curve*. Salt Lake Astronomical Society Meeting, Salt Lake City, UT, 2015

ACADEMIC REFERENCES

Nepomuk Otte
Georgia Institute of Technology, Associate Professor
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Charles Jui
University of Utah, Professor (Thesis Advisor)
Phone: 801-581-7186
Email: charles.jui@utah.edu

John Matthews

University of Utah, Cosmic Ray Physics Program Manager
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