

Troy J. Raen

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Education

University of Pittsburgh

August 2016 - Present

Doctorate of Philosophy, Physics (in progress)
Master of Science, Physics (2018)
Advisor: Dr. Michael Wood-Vasey

University of Utah

Undergraduate Research Scholar Designation
Bachelor of Science, Physics (2016)
Bachelor of Science, Applied Mathematics (2016)
Bachelor of Science, Psychology (2002)

Current Work

Pitt-Google Alert Broker

I am a core member and lead software developer of the team building a Google Cloud-based alert broker to ingest, filter, cross-match, classify, and distribute the live data streams of large-scale astronomical surveys like the upcoming Vera Rubin Observatory's Legacy Survey of Space and Time (LSST).

Publications

The Pitt-Google Astronomical Alert Broker (in prep.)

Troy J. Raen, Daniel Perrefort, Christine Mazzola, Michael Wood-Vasey

The Effects of Asymmetric Dark Matter on Stellar Evolution I: Spin-Dependent Scattering (2021)

Troy J. Raen, Héctor Martínez-Rodríguez, Andrew R. Zentner, Travis J. Hurst, Carles Badenes, Rachel Tao

Predicting Orbital Properties of High Velocity Stars Near the Galactic Center

Troy J. Raen, Benjamin C. Bromley, Anil C. Seth
Undergraduate Research Journal, Volume 1, 2015. University of Utah.

Side Projects

Effects of Training Sample Size on the Errors in Photo-z Estimates from Machine Learning Algorithms (2019)

[Final Report](#)

Talks and Presentations

Pitt-Google Broker (invited talk)

August 9, 2021

Rubin Observatory Project & Community Workshop 2021
Virtual Conference

Pitt-Google Broker ([tutorial presentation](#))

April 13, 2021

LSST Enabling Science 2021 Broker Workshop. Part II.
Virtual Conference

Pitt-Google Broker and DESC Needs (talk)

February 22, 2021

DESC Alerts Topical Team Meeting
Virtual Meeting

Pitt-Google Broker (invited talk)

October 28, 2020

LSST Enabling Science 2020 Broker Workshop
Virtual Conference

A Bayesian Meta-Classifer for the Pitt-Google Alert Broker (flash talk)

August 13, 2020

Rubin Observatory Project & Community Workshop 2020
Virtual Conference

A Bayesian Belief Network for Streaming Classification of the Variable Night Sky (invited talk)

January 31, 2020

Statistical Methods for the Physical Sciences
Carnegie Mellon University

Finding Cataclysmic Variable Stars and Supernovae in Photometric Survey Alert Streams (talk)

January 28, 2020

Astro-snacks Seminar Series
University of Pittsburgh

Setting up an LSST Alert Broker (talk)

September 26, 2019

Midwest Workshop on Supernovae and Transients
The Ohio State University, Center for Cosmology and AstroParticle Physics

Asymmetric Dark Matter in Stars (talk)

August 6, 2019

LSST Dark Matter Workshop
University of Chicago, Kavli Institute for Cosmological Physics

Dark Matter in Stars (talk)

November 6, 2018

Astro-snacks Seminar Series
University of Pittsburgh

Fellowships and Awards

Arts & Sciences Fellow in Physics and Astronomy

Fall 2019, Spring 2020

University of Pittsburgh

UROP Scholar

Fall 2014, Spring 2015

University of Utah

Undergraduate Research Opportunities Program

Travel Awards

Pitt-PACC Travel Award

September 26-27, 2019

Midwest Workshop on Supernovae and Transients (Talk)

The Ohio State University, Center for Cosmology and AstroParticle Physics

Pitt-PACC Travel Award

August 5-7, 2019

LSST Dark Matter Workshop (Talk)

University of Chicago, Kavli Institute for Cosmological Physics

Pitt-PACC Travel Award

June 19-21, 2019

LSST Community Broker Workshop

Seattle, WA

Teaching

Introduction to Physics 1 (PHYS 0110)

Summer 2021

Instructor, University of Pittsburgh

Introduction to Physics 1 (PHYS 0110)

Summer 2020

Instructor, University of Pittsburgh

Teaching Assistant

Thermodynamics & Statistical Mechanics (PHYS 2541)

Spring 2021

Grader, University of Pittsburgh

Graduate Core-Course TA

Fall 2020, Spring 2021

Teaching Assistant, University of Pittsburgh

Dynamic Systems (PHYS 2513)

Fall 2020

Grader, University of Pittsburgh

Introduction to Physics 1 (PHYS 0110)

Summer 2019

Teaching Assistant, University of Pittsburgh

Introduction to Physics 1 (PHYS 0110)

Fall 2018

Teaching Assistant, University of Pittsburgh

Basic Physics for Science and Engineering I & II (PHYS 0174 & 0175)

Summer 2018

Teaching Assistant, University of Pittsburgh

Basic Physics for Science and Engineering II (PHYS 0175)

Spring 2018

Teaching Assistant, University of Pittsburgh

Stars, Galaxies, and the Cosmos (ASTRON 0089)

Fall 2017

Teaching Assistant, University of Pittsburgh

Basic Physics for Science and Engineering I (PHYS 0174)

Spring 2017

Teaching Assistant, University of Pittsburgh

Basic Physics for Science and Engineering I (PHYS 0174)

Fall 2016

Teaching Assistant, University of Pittsburgh

**Previous
Employment**

Vista Treatment Centers

August 2002 - July 2016

IT and Clinical Records Manager

Purchased, set up, and maintained IT equipment including computers, server, copiers, network equipment.

Managed and supported clinical charting software.

Built & maintained facility websites.

Implemented HIPAA-compliant security systems for computers, mobile phones, and other BYOD devices.

Audited and maintained clinical records.

Enforced documentation standards.

Medical/clinical records releases.

Centralized and standardized the IT and clinical records of the company's five facilities.

Human Resources Manager

Responsible for new hire training and paperwork, payroll coordination, tracking and scheduling employee certifications.

Office Manager

Supervised day staff, maintained reference records, compiled reports from all departments, greeted and directed parents/visitors.

Program Coordinator

Managed the young adult, outpatient facility. Created and implemented programming. Trained and supervised staff.

Direct Care staff

Supervised adolescents in inpatient treatment; mentored patients in support of specific treatment goals. Often involved deescalating agitated patients.