

Roy E. Prouty, Jr.

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Education

1/2016 - Present	University of Maryland, Baltimore County (UMBC) Ph.D. Computer Science (<i>in progress</i>) Machine Learning Applications for Astrophysical Datasets Image Registration
8/2014 - 8/2016	University of Maryland, Baltimore County M.S. Atmospheric Physics Cloud-Aerosol Microphysics Radiative Transfer
9/2009 - 5/2013	Richard Stockton College of New Jersey (RSC) (now Stockton University) B.S. Applied Physics Minor in Mathematics Wavelet Analysis Analysis of Meteorological Phenomena

Research Positions

6/2019 - Present	Computational Stellar Spectroscopy Work with Dr. Don Engel and Johns Hopkins University Applied Physics Lab Infrared Spectroscopist Dr. Carey Lisse on refining stellar classification algorithms and developing automated algorithms for determining chemical abundances in stellar atmospheres.
6/2017 - 4/2018	NASA Goddard Spaceflight Center Collaborator & Intern Work with Dr. Jacqueline Le Moigne from NASA GSFC internship addressing development of scalable georegistration algorithms using Pyramid Wavelet Decomposition.
1/2016 - 12/2017	Center for Hybrid Multicore Productivity Research; Research Assistant (RA) Work under Dr. Milton Halem, Director of Center for Hybrid Multicore Productivity Research. Gained experience writing proposals for ROSES and other smaller solicitations concerning development of observation system simulation experiments with NASA Land Information System and development of regression model for CO ₂ flux inferences using feed-forward neural networks.
1/2014 - 8/2016	Joint Center for Earth Systems Technology RA Worked with Dr. Zhibo Zhang to investigate angular distribution models of radiance fields from above-cloud biomass-burning aerosols and development of OMI Absorbing Aerosol Index pipeline. Used Polarized Doubling-Adding Radiative Transfer Model from NASA GISS. Developed elementary Monte Carlo Radiative Transfer Model for multi-level plane-parallel atmospheres.
11/2013 - Present	Computational Planetary Science Work with Dr. Susan Hoban and Planetary Science Institute Astronomer Dr. Nalin Samarasinha on cometary observational campaigns using UMBC Observatory and refine cometary photometry algorithms for constraint of cometary dynamics.

Professional Positions

8/2017 - Present	Research Computing Specialist Full-time Staff in UMBC Division of Information Technology for purposes of (1) deploying and administering HPC clusters & (2) helping students, faculty, and staff accomplish computational research goals on any of the research clusters or research environments owned and administered by UMBC.
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11/2013 - Present | **Director, UMBC Observatory**
 Operating under Center for Space Sciences Technology, lead researcher on DFM 0.8m, f/8 research-grade telescope in Physics Building at UMBC. Led various planetary observational campaigns. Continued work with UMBC Observatory includes weekly public outreach events consisting of Open Houses and/or Public Stargazing. During the COVID-19 Pandemic, led the development of a monthly podcast series available on Spotify. Manager of 3+ undergraduate paid internships.

Academic Instruction

8/2020 - Present | **Undergraduate Research Advisor**
 Under supervision of Dr. Engel, directed research meetings and set research goals on three projects with UMBC Observatory interns.
 ... **Computer Vision**
 Investigating novel image registration techniques to enable super-resolution of astronomical observations with Mason Schuckman (CSMC, '25).
 ... **Conversion of Serial Fortran Code to Parallel C**
 Rewriting cometary dynamics code from 1990 and refactoring for use with parallel computing environments with Onkar Rekhi (MECH, '23).
 ... **Stellar Spectra**
 Exploring stellar radiative transfer equations and formulating pipeline for generating stellar spectra for a variety of T_{eff} , $[M/H]$, $\log(g)$, R with Jessica Harryman (PHYS, '21).

10/2016 - Present | **NGSS and K-12 Science Curriculum Consultant**
 Contracted development of various STEM courses for Maryland Public Schools

1/2018 | **Co-Lead on Educator Professional Development Series**
 Delivery of EPD Lectures on Climate Science congruent with Next Generation Science Standards
 Week-long delivery of topics related to climate science via delivery of CHEW (Climate, Health, Ecosystem, Weather) curriculum developed by Dr. Alexandra St. Pé

6/2016 - 6/2018 | **Anne Arundel County Public Schools**
 Substitute Teacher
 Deliver lessons and minor instruction in mathematics, physics, and computer science.

5/2016 - 5/2018 | **Education Department at Maryland Academy of Sciences**
 Responsible for development and delivery of various astronomy-themed presentations for delivery in planetarium or observatory.

5/2016 - 5/2017 | **NASA's BEST Robotics**
 Robotics Educator
 Run robotics camps in Maryland County Schools as a part of Beginning Engineering, Science, & Technology grant. Develop and deliver structured lectures focused on project-based learning for students between the 8th and 9th grade. The aim of this course is to widen knowledge of basic astronomy, focusing on NASA missions.

1/2014 - Present | **UMBC Guest Lecturer**
 Guest Lecturer in Physics and Astronomy Courses
 Deliver lectures on astronomy in undergraduate courses. Topics ranging from astrobiology, observational astronomy, and galactic astronomy.

12/2013 - Present | **UMBC Observatory Open House Lecturer**
 Delivery of Public Lecture Series on Astrophysics
 Monthly Podcast Co-Host
 Monthly one-hour talks on topics in astrophysics

8/2013 - 12/2014 | **Teaching Assistantships ...**
 ... **at UMBC**
 Worked with Senior Lecturers Eric Anderson, Lili Cui, and Susan Hoban to proctor lab-sections for both algebra and calculus-based introductory physics courses.

9/2011 - 5/2013 | ... **at RSC**
 Oversaw 4-5 physics graders. Developed, proctored, and graded introductory physics exams.

1/2010 - 5/2013 | **Physics Stockroom Technician at RSC**
 Responsible for setting up undergraduate physics course laboratories, maintaining equipment, as well as devising, constructing & carrying-out physics demonstrations for undergraduate physics classes.

Service

3/2021 - Present	Member, UMBC Exempt Staff Senate Attended regular meetings with fellow senators and disseminated and/or discussed information to other staff at UMBC.
8/2019 - Present	UMBC Astronomy Club; Advisor Meets regularly with student president and physics department faculty to ensure good communication on Astrophysics Minor. Works with student president to ensure proper procedure for meetings and budgets are followed. Attends and supports Astronomy Club meetings and provides mentorship to undergraduate students.
8/2018 - Present	NerdNite Baltimore Boss Organized monthly lecture series delivered by Baltimore locals on a variety of topics as lead of local non-profit. Managed logistics, speakers, and funds.
7/2018 - 7/2019	President, Member, University System of Maryland (USM) Student Council Liaised regularly with Presidents of all USM Campuses, USM Chancellor, and USM Board of Regents. Responsible for representation and advocacy on behalf of over 176,000 students. Responsible for familiarity with legislative issues at the state and federal levels concerning higher education. Main accomplishments: reorganized governing documents, set clerical precedents to ensure information retention across administrations, delivered testimony to MD House Committee on Appropriations.
9/2017 - 7/2019	Chair, Member, UMBC Steering Committee Chaired University Steering Committee as coordinating body of Shared Governance at UMBC. Worked with Office of Institutional Advancement and President's Office to support structure of Shared Governance at UMBC. Main accomplishments: set precedent of senate-driven meeting agendas, minor amendments to governing documents.
7/2016 - 7/2019	President, Historian, UMBC Graduate Student Government Liaised regularly between UMBC Administrators, graduate faculty, graduate program directors, and graduate students across the university to represent best interests of graduate students. Managed and coordinated five executive officers. Responsible for development and execution of \$300,000 annual operating budget. Regularly liaised with Graduate Program Directors, Graduate School Administrators. Main accomplishments: reorganized governing documents, reorganized research & professional development grants, reorganized senate structure.

Presentations

Dec. 2017	R. Prouty, Jacqueline LeMoigne, Milton Halem. <i>Efficient Method for Scalable Registration of Remote Sensing Images</i> . Poster at Fall 2017 AGU Meeting
Dec. 2016	R. Prouty, Asen Radov. <i>Inferring CO₂ Fluxes from OCO-2 for Assimilation into Land Surface Models to Calculate Net Ecosystem Exchange</i> . Poster at Fall 2016 AGU Meeting
Jan. 2016	R. Prouty; M.S. Defense. <i>Impact of Above Cloud Aerosol on the Angular Distribution Pattern of Cloud Bidirectional Reflectance and Implication for Above Cloud Aerosol Direct Radiative Effect</i> .
Oct. 2015	N.H. Samarasinha, ..., M. Knight, S. Hoban, R. Prouty et al. <i>Results from the worldwide coma morphology campaign for comet ISON (C/2012 S1)</i> , Planetary and Space Science.
Jul. 2012	<i>The Study of Small Scale Features (Fronts) Found in Long Term Temperature Records</i> Poster at American Association of Physics Summer Meeting (Philadelphia, PA)
Nov. 2012	<i>Use of Wavelets to Analyze Long Term Temperature Data and Short Term Atmospheric Phenomena</i> Poster at SPS Quadrennial Congress (Orlando, FL)
7/2012 - 8/2012	Geologic Study Tour of Southwestern United States Investigating the geologic structure and history of the Great Salt Lake as well as the canyons of the Colorado Plateau: Bryce, Glen, and Zion; the Grand Canyon.
7/2010 - 8/2010	Geologic Study Tour of Northern China Visited cities of Datong, Xi'an, and Beijing led by Associate Professor of Physical Geography Weili Qu of Beijing Normal University. Investigating geologic structure and history of northern China.

Conferences & Workshops

2016, 2017, 2018 American Geophysical Union Fall Meetings. 2016, 2017 NASA Goddard Aerosols and Radiation Conference. 2017, 2018. Astronomical Data Analysis Software & Systems. 2018 Virtual Residency Intermediate Workshop. 2018, 2019 SuperComputing.