

Jacob Bieker

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EDUCATION

Leiden University, Leiden, Netherlands

MSc Astronomy Sep 2018 – Present

Astronomy and Data Science specialization

Thesis: Clustering and Physical Properties of CO Emitters in Wide ASPECS

Thesis: Cross Identification for the extended faint radio source population in the LoTSS Survey

University of Oregon, Eugene, Oregon, USA

BSc Physics, Computer and Information Science Sep 2014 – Jun 2018

Thesis: Using Deep Learning for FACT Gamma/Hadron Classification

Robert D. Clark Honors College

Departmental honors: Physics, Computer and Information Science

Trans-Atlantic Science Student Exchange Program Aug 2016 – Jun 2017

Aarhus University, Denmark

RESEARCH EXPERIENCE

Huub Group, Leiden University

Graduate Student Researcher Feb 2020 – Present

Developing machine learning tools to analyze LOFAR radio survey data of the entire northern sky for source association and identification.

Gsuite Growth Team, Google

Software Engineering Intern Sep 2019 – Dec 2019

Implemented an end-to-end machine learning pipeline for Gsuite.

Presented deep dives into machine learning to team members, and worked with data scientists to develop better models and pipelines for the project.

Goddard Space Flight Center, NASA

Machine Learning Intern Jun 2019 – Aug 2019

Developed Machine Learning algorithms for hyperspectral image segmentation with Hyperion data for use in future NASA Earth observation satellites.

Hodge Group, Leiden University

Graduate Student Researcher Sep 2018 – Jul 2019

Study CO emitting galaxies in the GOODS-South field as part of the Wide-ASPECS survey

Analyzed multi-wavelength data and integrated that data with new data from the survey

Biophysics, Imaging, Soft Materials Lab, University of Oregon

PURS Undergraduate Researcher Sep 2017 – Jun 2018

Study how structure affects the growth and development of gut microbe communities

Create 3D data visualizations using virtual reality

Astroparticle Physics Group, Technische Universitaet Dortmund

RISE Germany Research Intern Jun 2017 – Sep 2017

Improved unfolding techniques for data from FACT telescope

Developed machine learning software for automated gamma-ray spectrum analysis

Produced Tech Report

FisherGroup, University of Oregon

Undergraduate Researcher Dec 2014 – Sep 2017

Analyzed Gemini spectrometric and HST photometric data as part of the Galaxy Cluster Project

Developed visualizations of the data

Developed user interfaces and other software for the Pine Mountain Observatory

Published paper and presented research at international conferences

High-Performance Computing Lab, University of Oregon

Undergraduate Researcher Mar 2016 – Jul 2017

Analyzed scientific texts using natural language processing

Published paper and presented research at undergraduate symposium

Institute of Theoretical Science, University of Oregon

Undergraduate Researcher Feb 2015 – Aug 2016

Ran simulations of Type Ia supernovae and Rossby Wave Instabilities

Lead student researcher of group

Visualized output data from simulations

Initiated collaboration between computer science research group and astrophysics group

Modified Chymera software for better parallelization and in-situ data processing

Center for High Energy Physics, University of Oregon

Undergraduate Researcher Jan 2016 – Aug 2016

Worked on visualizing and analyzing luminosity data from the ATLAS experiment

Compared luminosity readings from ATLAS and CMS
Presented findings to CERN researchers

Computing and Data Understanding at eXtreme Scale (CDUX), University of Oregon
Undergraduate Researcher Jan 2016 – Jun 2016
Integrated data visualizations with astrophysics simulations to improve resource utilization
Initiated collaboration between two research groups

Computational Biology Program, Oregon Health and Science University
Quantitative Bioscience and Biomedical Engineering Intern Jun 2015 – Aug 2015
Developed software for data visualization of large genomics sets and patient data
Collaborated with national and international research groups
Developed error correction software using statistical analysis
Improved database software for use with the Collaborative Cancer Cloud

PUBLICATIONS

PAPERS

“The Evolution of Bulge-dominated Field Galaxies from $z \approx 1$ to the Present” *The Astrophysical Journal*, Sep 2017.

“RISE Germany Internship: Unfolding FACT Data” *TU Dortmund*, Nov 2017.

“Do you know where your research is being used? An exploration of scientific literature using Natural Language Processing” *Oregon Undergraduate Research Journal*, vol. 10, no. 1, pp. 20–31 Jan 2017.

PRESENTATIONS

“Automated Radio Source Component Association and Cross-Identification for LoTSS” *European Astronomical Society Annual Meeting 2020*, Leiden, The Netherlands, Jun 2020.

“Exploring Deep Learning for FACT Source Detection” *232nd Meeting of the American Astronomical Society*, Denver, Colorado, USA, Jun 2018.

“Evolution in Solitude – Field Galaxies from Half the Age of the Universe to the Present” *229th Meeting of the American Astronomical Society*, Grapevine, Texas, USA, Mar 2017.

“Life in Low Density Environments - Field Galaxies from $Z=1.0$ to the Present” at *29th International Astronomical Union General Assembly*, Honolulu, Hawaii Aug 2015.

AWARDS

Undergraduate Research Award	2018
Presidential Undergraduate Research Scholar	2017
DAAD Research Internships in Science and Engineering (RISE) Scholar	2017
NASA Oregon Space Grant Consortium Undergraduate Scholarship	2016
Henry V. Howe Scholarship	2016, 2017
1st Place Venture Labs: Telescope Competition	2015
Roe E. Stamps Leadership Scholarship	2014

ORGANIZATIONS

Design For America,
University of Oregon, Eugene, Oregon
Team Lead - Wearable Technology 2017 – 2018

Society of Physics Students,
University of Oregon, Eugene, Oregon
Officer - Web Development 2017 – 2018

WORK EXPERIENCE

Institute of Neuroscience, University of Oregon
Software Developer Jun 2015 – Aug 2016
Designed and implemented software solutions independently within given constraints
Worked with databases, such as SQLite, PostgreSQL, and FileMaker
Create software using Python for National Science Foundation (NSF) Research Experience for Undergraduates (REU) programs

Oregon Undergraduate Research Journal, University of Oregon
Web Developer May 2015 – Apr 2016
Developed website dedicated to undergraduate research for all Oregon University System schools
In charge of user experience, design, and development

SKILLS

Languages: Python, Java, R, C/C++, C#, ROOT, Fortran
Tools: PyTorch, Tensorflow, Keras, TFX, GCP, Git, Kubernetes, Docker