JENNIFER KADOWAKI

PhD Candidate in Astrophysics

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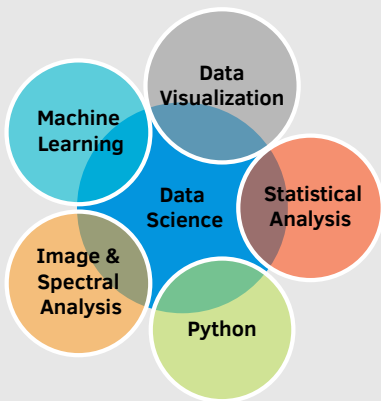
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Skills

Courses

Relevant Graduate Coursework

- Computer Vision (Spring 2019)
- Data Mining & Discovery
- Instrumentation & Statistics
- Introduction to Machine Learning
- Neural Networks
- Numerical & Statistical Methods
- Statistical Methods in Astrophysics
- Statistical Natural Langauge Processing (Spring 2019)

Relevant Course Projects

- **Statistical Methods**: Reproduced the 2011 Physics Nobel Prize results of the accelerating expansion of the universe using Bayesian analysis. Tested results for bias due to host galaxy masses.
- **DM/ML in Astronomy**: Detected dwarf galaxies using kernel density estimation on large imaging surveys. Evaluated the completeness and false detection rates for different kernels.
- **Neural Networks**: Conducting sentiment analysis of tweets. (To be completed in Dec 2018.)

Education

2015 - 2020	**PhD Major, Astronomy & Astrophysics** **PhD Minor, Information Sciences**	University of Arizona
2015 - 2018	**MS, Astronomy & Astrophysics**	University of Arizona
2010 - 2014	**BS, Physics**	UCLA

Publications

- *Spectroscopic Confirmation of the Existence of Massive Ultra-diffuse Galaxies* **Kadowaki**, Zaritsky, & Donnerstein. *in prep.*
- *Separating the Disk and Jet Activities of Violently Variable Gamma-ray Sources* Malkan, **Kadowaki**, & Webb. *in prep.*
- *Systematically Measuring Ultra Diffuse Galaxies (SMUDGes). I. Survey Description and First Results in the Coma Galaxy Cluster and Environs* Zaritsky, Donnerstein, Dey, **Kadowaki**, et al. Accepted in ApJL.
- *Spectroscopy of Ultra-diffuse Galaxies in the Coma Cluster* **Kadowaki**, Zaritsky, & Donnerstein. 2017, ApJL, 838, L21.

Employment

Data Reduction Specialist	National Optical Astronomy Observatory
The NOAO Data Lab Team	May 2018 - Aug 2018

- Developed ML-based science cases to showcase Data Lab products to users.
- Conducted exploratory analysis and predictive modeling to discover new ultra-diffuse galaxies in image and catalog data.
- **Tools**: Python (scikit-learn, pandas, bokeh, seaborn), Machine Learning (random forest, nearest neighbor), JupyterLab, SQL

Graduate Teaching Assistant	University of Arizona
ASTR 170B: *The Physical Universe*	Jan 2017 - May 2017
ASTR 201: *Cosmology*	Jan 2018 - May 2018

Research

Graduate Research Assistant	University of Arizona
PhD Dissertation: *The Formation of Massive Ultra-diffuse Galaxies*	Aug 2015 - present

- Searching for ultra-diffuse galaxies (UDG) in TB-sized, deep-imaging surveys.
- Developing a distance-predicting algorithm to identify environments around UDGs and to determine the environment's role in UDG formation.
- **Tools**: Python (keras, scikit-learn, pandas, bokeh), Machine Learning (neural networks, random forest, nearest neighbor, kernel density estimation, regression), SQL
- **Award**: 🏆 Honorable Mention, NSF Graduate Research Fellowship (2017)

Graduate Research Assistant	University of Arizona
Masters Thesis: *Spectroscopy of UDGs in the Coma Cluster*	Aug 2015 - May 2017

- Spectroscopically confirmed the first set of UDGs in a galaxy cluster.
- Measured the average age and chemical composition of UDGs in galaxy clusters using stellar population synthesis models.
- **Tools**: Python (matplotlib), IRAF, PÉGASE-HR

Undergraduate Research Assistant	UCLA
Senior Thesis: *Separating the Disk and Jet Activities of Quasars*	Jan 2012 - Apr 2015

- Built a data reduction pipeline for optical and infrared imaging data.
- Measured photometry and modeled simultaneous disk and jet activities of 15 quasars to understand how accretion disks power relativistic jets.
- **Tools**: Python (AstroPy, NumPy, SciPy, AliPy, matplotlib), IRAF/PyRAF
- **Awards**: 🏆 UCLA Dean's Prize (2013), 🎓 Clare Boothe Luce Scholarship (2012-2013), 🎓 Northrup Grumman-Litton Scholarship (2013-2014)