Locke Patton

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Education

Harvard University — **Boston, MA**
Ph.D. Candidate Astronomy | Pierce Fellowship | Thesis Advisor: Prof. Edo Berger — *2018–Present*

University of Washington — **Seattle, WA**
Bachelor of Science in Physics & Astronomy | Advisor: Prof. Emily Levesque — *2015–2018*

Portland State University | Portland Community College — **Portland, OR**
Early College Student | PSU Dean's List – all years | Entered age 16 — *2012–2014*

Research Experience

Interests: Transients – Supernovae – Massive Stars – Population Synthesis Modeling – Observational Astronomy

Superluminous Supernova Host Galaxy Modeling with Prospector — **Boston, MA**
Prof. Edo Berger — *Fall 2018 – Present*
- Modeling non-parametric star formation histories, stellar mass and populations, dust and extinction with nested sampling
- Aiming to model the complete set of SNe, GRBs and TDEs host galaxies in order to cross-characterize population statistics

Light Curve Sonification of Supernovae and Other Transients with Zooniverse — **Seattle, WA**
Prof. Emily Levesque — *Fall 2017 – Present*
- Developed sonification package that depicts magnitude variations as perceptually uniform changes in pitch through time
- Classifying these supernova audio lightcurves with TransientZoo, opening citizen science to the blind and visually impaired

Optical Galaxy Resolved Spectroscopy and Python Code Development — **Seattle, WA**
Prof. Emily Levesque — *Fall 2016 – Present*
- Reduced and extracted starburst galaxy NGC6946 resolved long slit spectroscopy
- Determined supernovae host site $log(\frac{O}{H}) + 12$ metallicity & star formation rate, metallicity, extinction maps ***Paper in prep.***

Stellar Cluster Photometry — **Seattle, WA**
Prof. Ana Larson — *Winter 2015 – Spring 2017*
- Performed Milky Way open cluster strömgren photometry to determine cluster metallicities
- Developed cluster membership analysis program in Python, independently

Northern Arizona University REU: Stellar Spectroscopy, Photometry, Modeling — **Flagstaff, AZ**
Prof. Philip Massey — *Summer 2017*
- Reduced, calibrated and extracted 100+ stellar spectra and photometry from the 6.5m Magellan and Hubble Telescopes
- Performed OB star spectral identification and FASTWIND temperature modeling on the LMC's Lucke-Hodge 41 cluster

UV Quasar Absorption Spectroscopy — **Seattle, WA**
Prof. Jessica Werk — *Summer 2016*
- Identified absorption lines in $z \sim 1$ QSOs, and beta-tested pyIGM absorption GUI
- Analyzed intergalactic & interstellar media Hubble COS spectroscopy

Awards + Fellowships

Chambliss Astronomy Achievement Graduate Award: 233rd AAS — *Jan 2019*
Pierce Fellowship: Harvard University — *2018 - 2021*
FAMOUS Travel Grant Recipient: 231st AAS Winter Conference — *Winter 2017*
UW Mary Gates Research Scholar: Fireworks Galaxy Resolved Metallicity — *Winter 2017*
UW Mary Gates Research Scholar: Cluster Membership Code Development — *Fall 2016*
UW Astronomy Undergraduate Prize for Excellence in Academics: Baer Prize — *Fall 2016*
FTC World Championship 2012 Core Values Team: FIRST Robotics Competitions — *2006 – 2013*

Teaching Experience

Intro Physics TA: Pioneer Undergraduate for UW TA Program — *2016 – 2018*
Physics Lab Assistant: Developing, testing and designing physics education equipment — *2015 – 2018*
Teaching Intern: Hillsdale High School + Touchstone Elementary School — *2014 – 2015*
Private Tutor: 12+ Student Clients in college mathematics, physics — *2013 – 2017*

Presentations + Publications

232nd AAS Winter Poster: Sonification of Transient Lightcurves: Supernovae Case Studies *Jan 2019*

UW Undergraduate Research Symposium Poster: Mapping the Supernovae-Rich Fireworks Galaxy *Spring 2018*

231st AAS Winter Poster #*251.03*: Mapping the Supernovae-Rich Fireworks Galaxy NGC 6946 *Jan 2018*

The League of Astronomers Talk: Lucke-Hodge 41: Massive Stars in the LMC *Fall 2017*

Theodor Jacobsen Observatory Newsletter: The Universe Is Hissing At Us *Summer 2017*

Northern Arizona University Talk: Characterizing OB Stars in the Large Magellanic Cloud *Summer 2017*

UW Undergraduate Research Symposium: Talk + Poster | Presented Two Projects *May 2017*

- Fireworks Galaxy Supernovae Host Site Metallicities
- MW Open Cluster Metallicities + Membership Assignment in SDSS u, g, r, i, z and Stromgren v, b, y

Theodor Jacobsen Observatory Outreach Talk: Supernovae - How to Blow Up a Massive Star 101 *May 2017*

UW Planetarium: Public Outreach Universe Tours *Spring 2017 - 2018*

UW Undergraduate Research Symposium Poster: Open Cluster Membership Assignment with Python *May 2016*

Northwest Astronomy Meeting: Presentation and Poster: MW Open Clusters Membership Assignment *Oct 2016*

Technical Skills

Python: Pioneered 2 Solo Code Projects: OCMAP cluster membership + AME PyRAF apall extension

IRAF | PyRAF: Reduction | spectroscopy | calibration | membership | photometry

Languages: Python | SQL | JavaScript | Java | Fortran | Mathematica | Latex | Bash | French

Telescopes: Observed 15+ nights at APO 3.5m, MRO 0.75m + DAO 1.83m

Volunteer Outreach

Skype A Scientist: Sharing research with 3rd/5th/6th grade classrooms *Fall 2018*

Astronomy on Tap: A Tour of the Worst Named Telescopes in History *Apr 2018*

Astronomy on Tap: Listening to the Dying Wails of Massive Stars *Apr 2018*

Astronomy Undergrad Liaison: Undergraduate representative at faculty meetings *2017 – 2018*

League of Astronomers: *2017 – 2018*

- UW Astronomy Outreach - Science Officer
- Hosted Star Party for 40+ New Husky Students

Women's Action Commission: Gender in STEM Panel: Transgender Representative *Spring 2017*

Planetarium Volunteer: OMSI Planetarium | SpaceX Child Outreach Program *2014 – 2015*

Press

UW College of Arts Sciences Focus Piece: To Infinity and Beyond: Locke Patton *Apr 2018*

- `https://spark.adobe.com/page/3AZgOK4X8ATWR/`

UW Astronomy Department Spring 2018 Newsletter: Qudos of the Quarter *Spring 2018*