

# Locke Patton

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## Education

<b>Harvard University   Masters in Astronomy</b> <i>Phd program   Pierce Fellowship   Thesis Advisors: Prof. Edo Berger + Prof. Charlie Conroy</i>	<b>Cambridge, MA</b> 2018–2021
<b>University of Washington   Bachelor of Science in Physics &amp; Astronomy</b> <i>Advisor: Prof. Emily Levesque</i>	<b>Seattle, WA</b> 2015–2018
<b>Portland State University   Portland Community College</b> <i>Early College Student   PSU Dean's List – all years   Entered age 16</i>	<b>Portland, OR</b> 2012–2014

## Research Experience

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

**Superluminous Supernova Host Galaxy Modeling with Prospector** **Cambridge, MA**  
*Prof. Edo Berger + Prof. Charlie Conroy* Fall 2018 – Present

- Modeling non-parametric star formation histories, stellar mass and populations, dust and extinction with nested sampling
- Characterizing population statistics of the complete set of superluminous supernovae type I host galaxies

**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 strömngren 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

<b>John P. and Carol J. Merrill Graduate Fellowship:</b> Harvard University	2019
<b>Chambliss Astronomy Achievement Graduate Award:</b> 233rd AAS	Jan 2019
<b>Pierce Fellowship:</b> Harvard University	2018 - 2021
<b>FAMOUS Travel Grant Recipient:</b> 231st AAS Winter Conference	Winter 2017
<b>UW Mary Gates Research Scholar:</b> Fireworks Galaxy Resolved Metallicity	Winter 2017
<b>UW Mary Gates Research Scholar:</b> Cluster Membership Code Development	Fall 2016
<b>UW Astronomy Undergraduate Prize for Excellence in Academics:</b> Baer Prize	Fall 2016

## Teaching Experience

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

## Papers

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<b>Mapping the Supernova-Rich Fireworks Galaxy NGC 6946:</b> L Patton, E Levesque	<i>in prep.</i>
<b>soni-py: A Pitch-based Data Sonification Package:</b> L Patton, E Levesque	<i>July 2020</i>
<b>The Tidal Disruption Event AT 2018hyz II: Light Curve Modeling of a Partially Disrupted Star:</b> Gomez et al.	<i>March 2020</i>
<b>SN 2016iet: The Pulsational or Pair Instability Explosion of a Low Metallicity Massive CO Core:</b> Gomez et al.	<i>April 2019</i>

## Presentations + Publications

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<b>233rd AAS Winter Poster:</b> Sonification of Transient Lightcurves: Supernovae Case Studies	<i>Jan 2019</i>
<b>UW Undergraduate Research Symposium Poster:</b> Mapping the Supernovae-Rich Fireworks Galaxy	<i>Spring 2018</i>
<b>231st AAS Winter Poster #251.03:</b> Mapping the Supernovae-Rich Fireworks Galaxy NGC 6946	<i>Jan 2018</i>
<b>The League of Astronomers Talk:</b> Lucke-Hodge 41: Massive Stars in the LMC	<i>Fall 2017</i>
<b>Theodor Jacobsen Observatory Newsletter:</b> The Universe Is Hissing At Us	<i>Summer 2017</i>
<b>Northern Arizona University Talk:</b> Characterizing OB Stars in the Large Magellanic Cloud	<i>Summer 2017</i>
<b>UW Undergraduate Research Symposium:</b> Talk + Poster   Presented Two Projects	<i>May 2017</i>
◦ Fireworks Galaxy Supernovae Host Site Metallicities	
◦ MW Open Cluster Metallicities + Membership Assignment in SDSS u, g, r, i, z and Stromgren v, b, y	
<b>Theodor Jacobsen Observatory Outreach Talk:</b> Supernovae - How to Blow Up a Massive Star 101	<i>May 2017</i>
<b>UW Planetarium:</b> Public Outreach Universe Tours	<i>Spring 2017 - 2018</i>
<b>UW Undergraduate Research Symposium Poster:</b> Open Cluster Membership Assignment with Python	<i>May 2016</i>
<b>Northwest Astronomy Meeting:</b> Presentation and Poster: MW Open Clusters Membership Assignment	<i>Oct 2016</i>

## Technical Skills

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**Python:** Pioneered 2 Solo Code Projects: OCMAP cluster membership + AME PyRAF apall extension  
**Coding Languages:** *Python* | *Bash* | *SQL* | *JavaScript* | *Java* | *Mathematica* | *Latex*  
**IRAF** | **PyRAF:** Reduction | spectroscopy | calibration | membership | photometry  
**Telescopes:** Observed 15+ nights at APO 3.5m, MRO 0.75m + DAO 1.83m

## Volunteer Outreach

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<b>Committee of Academic Studies Representative:</b> Harvard Astronomy	<i>2018-2020</i>
<b>Skype A Scientist:</b> Engaging with 3rd/5th/6th grade classrooms about astronomy and research	<i>2018 - 2019</i>
<b>Astronomy on Tap:</b> A Tour of the Worst Named Telescopes in History	<i>Apr 2018</i>
<b>Astronomy on Tap:</b> Listening to the Dying Wails of Massive Stars	<i>Apr 2018</i>
<b>Astronomy Undergrad Liaison:</b> Undergraduate representative at faculty meetings	<i>2017 - 2018</i>
<b>League of Astronomers:</b>	<i>2017 - 2018</i>
◦ UW Astronomy Outreach - Science Officer	
◦ Hosted Star Party for 40+ New Husky Students	
<b>Women's Action Commission: Gender in STEM Panel:</b> Transgender Representative	<i>Spring 2017</i>
<b>Planetarium Volunteer:</b> OMSI Planetarium   SpaceX Child Outreach Program	<i>2014 - 2015</i>

## Meetings

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<b>AAS:</b> American Astronomical Society Meetings	<i>Winter 2018, 2019, 2020</i>
<b>ComSciCon:</b> Attended Flagship Workshop	<i>Summer 2019</i>
<b>GROWTH Summer School:</b> San Diego	<i>Summer 2019</i>

## Press

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<b>UW College of Arts Sciences Focus Piece:</b> To Infinity and Beyond: Locke Patton	<i>Apr 2018</i>
◦ <a href="https://spark.adobe.com/page/3AZgOK4X8ATWR/">https://spark.adobe.com/page/3AZgOK4X8ATWR/</a>	
<b>UW Astronomy Department Spring 2018 Newsletter:</b> Qudos of the Quarter	<i>Spring 2018</i>