

Kathryn F. Neugent

NASA Hubble Fellow at Harvard studying massive stars
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■ Education

University of Washington , Seattle, Washington	2017 - 2021
Ph.D. and M.S. in Astronomy Thesis: “The Binary Fraction of Red Supergiants” Advisor: Dr. Emily Levesque	
Northern Arizona University , Flagstaff, Arizona	2015 - 2017
M.S. with Distinction in Applied Physics Thesis: “The Discovery and Analysis of a New Type of Wolf-Rayet Star” Advisor: Dr. Philip Massey	
George Washington University , Washington D. C.	2010 - 2012
M.S. in Computer Science Certificate in Cyber Security and Information Assurance	
Wellesley College , Wellesley, Massachusetts	2006 - 2010
B.A. in Computer Science and Astronomy	

■ Research Appointments

Center for Astrophysics Postdoctoral Fellow , SAO	2025 - 2027
NASA Hubble Postdoctoral Fellow , Harvard University	2022 - Present
Dunlap Postdoctoral Fellow , Dunlap Institute, University of Toronto	2021 - 2022
Research Associate , Lowell Observatory, Dr. Phil Massey	2009 - 2022

■ Non-Research Appointments

Senior Web Security Specialist , National Renewable Energy Lab	2014 - 2015
Cyber Security Engineer , MITRE Corporation	2012 - 2013

■ Teaching & Advising

Graduate Teaching Assistant , University of Washington	
• Astronomy 101 (250 students)	Winter 2020 and Fall 2020
• Observational Astronomy for undergraduate majors (one section)	Spring 2020
Graduate Teaching Assistant , Northern Arizona University	
• Physics Mechanics Lab for non-majors (five sections total)	Fall 2015 and Spring 2016
• Astronomy 101 Lab for non-majors (one section)	Spring 2016
Undergraduate Teaching Assistant , Wellesley College	
• Astronomy 100 Lab Assistant for non-majors (six sections total)	Spring 2007 - Fall 2009
• Computer Mechanics Lab Assistant and Grader (one section)	Fall 2009

Research advisor

• Aditya Vijaykumar, NHFP Mentorship Program	2022 - Present
• Anna O’Grady, mentor and letter-writer for U of Toronto graduate student	2021 - Present
• Erin Aadland, NAU PhD Dissertation committee member	2022
• Tzvetelina Dimitrova, primary advisor for UW undergraduate	2019 - 2021
• Pre-MAP: advisor for two UW first-year undergrads	2020

■ Research Grants as PI

Hubble Postdoctoral Fellowship (\$100K + \$200K pending)	2022 - 2025
Sigma Xi Grants-in-Aid of Research (\$2.5K)	2018
NSF's IGERT Graduate Fellowship (\$30K)	2017 - 2019
AAS International Travel grant (\$2K)	2016
NSF Scholarship for Service (\$50K)	2010

■ Awards, Leadership, and Outreach

UW's Distinguished Dissertation Award recipient	2021
NHFP Anti-Racism Initiative Member	2022 - Present
AAS Chambliss Astronomical Writing Award Committee	2022 - Present
A&A, ApJ, AJ, and MNRAS referee	2017 - Present
Letter to a Pre-Scientist pen pal	2020 - Present
Skype a Scientist participant	2020 - Present
NSF AAG panel member	2022
AURA Future Leader	2022
Apache Point observatory telescope allocation committee member	2018 - 2020
UW Planetarium presenter	2017 - 2020
Look What the Cat Brought In (non-profit cat rescue) board member	2013 - Present

■ Conference Presentations

Invited Talks (6)

"The Wolf-Rayet Phenomenon in the Universe"	2023
IAUS #361: "Massive Stars Near and Far" in Ireland	unable to attend due to COVID
GAPS 2021 – unsolved problems in red Giants And suPergiantS	2021
AAS #238: Special Session on Thorne-Żytkow Objects	2021
"NidiaFest: Massive Stars and Supernovae" in Bariloche, Argentina	2018
EWASS Conference in Prague, Czech Republic	2017

Contributed Talks (8)

NASA Hubble Fellows Symposium	2022
"Stars on the Pathway to becoming GW Sources" at the EAS	2021
IAUS #361: "Massive Stars Near and Far" Virtual Preview Meeting	2021
AAS #237, Dissertation Talk	2021
MOBSTER-1 Virtual Conference	2020
MMT's 40th Anniversary Conference in Tucson, Arizona	2019
IAUS #329: "The lives and death-throes of massive stars" in Auckland, New Zealand	2016
"The International Workshop on WRs" in Potsdam, Germany	2015
"Massive Stars: From α to Ω " in Rhodes, Greece	2013

Posters (6)

AAS Meeting #233	2019
AAS Meeting #231	2018
"Bridging the gap: from massive stars to supernovae" at Chicheley Hall, England	2016
IAU #307: "New windows on massive stars" in Geneva, Switzerland	2014
AAS Meeting #218	2011
AAS Meeting #215	2010

■ Colloquia & Public Talks

Carnegie Observatories lunch colloquium	2023
University of Kansas colloquium	2022
Yale University colloquium	2022
University of Colorado: Boulder colloquium	2022
University of Louisville: Kentucky colloquium	2022
The Ohio State University CCAPP seminar	2022
Northwestern CIERA Science Happy Hour	2022
MIT lunch talk	2021
University of Toronto colloquium	2021
DAO / NRC HAA Astronomy colloquium	2021
Case Western Reserve University colloquium	2021
Denver University colloquium	2021
NOIR Lab / Steward colloquium	2021
University of Auckland Astronomy seminar	2021
The Ohio State University's CCAPP seminar	2020
CalTech tea talk	2020
Harvard / CfA's Galaxies & Cosmology seminar	2020
Florida Tech colloquium	2020
Lowell Observatory's "Meet An Astronomer" public talk	2020
Skype A Scientist's "No Time Like the Presentation" public talk	2020
Seattle's Astronomy on Tap	2019
UW's Theodor Jacobson Observatory public talk	2019
Geneva University, Switzerland colloquium	2018
University of Colorado: Boulder lunch colloquium	2016
University of Washington lunch colloquium	2016

■ Awarded Telescope Time

Telescope	Instrument	# Nights / Orbits
HST (co-I)	STIS, COS, WFC3/UVIS	44
Gemini 8m (North and South; PI / co-I)	GMOS	10
MMT 6.5m (PI / co-I)	Hectospec	20
Magellan 6.5m (Clay and Baade; PI / co-I)	IMACS, MagE, FIRE	30
Lowell Discovery Telescope 4.3m (PI / co-I)	LMI, EXPRES	25
Apache Point 3.5m (PI)	DIS	2
Kitt Peak 2.1m (co-I)	Gold Spectrograph	5
Swope 1m (co-I)	CCD Imager	45

Publications

h-index = 17, first-authored h-index = 14

■ Refereed, First-Authored Publications

- 16) **Neugent, K.F.**, 2021, “The Red Supergiant Binary Fraction as a Function of Metallicity in M31 and M33,” *ApJ*, 908, 87
- 15) **Neugent, K.F.**, Levesque, E. M., Massey, P., Morrell, N. I., & Drout, M. R., 2020, “The Red Supergiant Binary Fraction in the Large Magellanic Cloud,” *ApJ*, 900, 118
- 14) **Neugent, K. F.**, Massey, P., Georgy, C., Drout, M. R., Mommert, M., Levesque, E. M., Meynet, G., & Ekstrom, S., 2020, “The Luminosity Function of Red Supergiants in M31,” *ApJ*, 889, 1
- 13) **Neugent, K. F.**, & Massey, P., 2019, “The Wolf-Rayet Content of the Galaxies of the Local Group and Beyond,” Review paper in MDPI Galaxies special issue on “Luminous Stars in Nearby Galaxies.” ed. Roberta Humphreys, *Galaxies*, 7, 74
- 12) **Neugent, K. F.**, Levesque, E. M., Massey, P., & Morrell, N. I., 2019, “Binary Red Supergiants II: Discovering and Characterizing B-type Companions,” *ApJ*, 875, 124
- 11) **Neugent, K. F.**, Levesque, E. M., & Massey, P., 2018, “Binary Red Supergiants: A New Method for Detecting B-type Companions,” *AJ*, 156, 5
- 10) **Neugent, K. F.**, Massey, P., & Morrell, N. I., 2018, “A Modern Search for Wolf-Rayet Stars in the Magellanic Clouds. IV. A Final Census,” *ApJ*, 863, 181
- 9) **Neugent, K. F.**, Massey, P., Morrell, N. I., Skiff, B., & Georgy, C., 2018, “A Runaway Yellow Supergiant Star in the Small Magellanic Cloud,” *AJ*, 155, 207
- 8) **Neugent, K. F.**, Massey, P., Hillier, D. J., & Morrell, N. I. 2017, “The Evolution and Physical Parameters of WN3/O3s: a New Type of Wolf-Rayet Star,” *ApJ*, 841, 20
- 7) **Neugent, K. F.**, & Massey, P. 2014, “The Close Binary Frequency of Wolf-Rayet Stars as a Function of Metallicity in M31 and M33,” *ApJ*, 789, 10
- 6) **Neugent, K. F.**, Massey, P., & Morrell, N. I. 2012, “The Discovery of a Rare WO-type Wolf Rayet Star in the Large Magellanic Cloud,” *AJ*, 144, 162
- 5) **Neugent, K. F.**, Massey, P., & Georgy, C. 2012, “The Wolf-Rayet Content of M31,” *ApJ*, 759, 11
- 4) **Neugent, K. F.**, Massey, P., Skiff, B., & Meynet, G. 2012 “Yellow Supergiants in the Large Magellanic Cloud,” *ApJ*, 749, 177
- 3) **Neugent, K. F.**, & Massey, P. 2011, “The Wolf-Rayet Content of M33,” *ApJ*, 733, 123
- 2) **Neugent, K. F.**, & Massey, P. 2010, “The Spectrum of the Night Sky over Kitt Peak: Changes Over Two Decades,” *PASP*, 122, 1246
- 1) **Neugent, K. F.**, Massey, P., Skiff, B., Meynet, G., & Olsen, K. A. F. 2010, “Yellow Supergiants in the SMC: Putting Current Evolutionary Theory to the Test,” *ApJ*, 719, 1784

■ Refereed, Co-Authored Publications

* = Student I advised

- 22) Olivier, G.M., **inc. Neugent, K.F.**, et al., “A Multiwavelength Study of the Massive Colliding Wind Binary WR 20a: A Possible Progenitor for Fast-Spinning LIGO Binary Black Hole Mergers,” ApJ, submitted
- 21) Margon, B., Morrell, N. I., Massey, P., **Neugent, K. F.**, & Williams, R. 2023, “A Survey for CII Emission-Line Stars in the Large Magellanic Cloud. II Final Results and the Origin of CII Emission in [WC] Spectra,” ApJ, 942, 85
- 20) Massey, P., **Neugent, K. F.**, Ekström, S., Georgy, C., & Meynet, G. 2022, “The Time-Averaged Mass-Loss Rates of Red Supergiants As Revealed by their Luminosity Functions in M31 and M33,” ApJ, in press
- 19) * O’Grady, A. J. G., Drout, M. R., Gaensler, B. M., Cochaneck, C. S., **Neugent, K. F.**, et al. 2022, “Cool, Luminous, and Highly Variable Stars in the Magellanic Clouds. II: Spectroscopic and Environmental Analysis of Thorne-Żytkow Object and Super-AGB Star Candidates,” ApJ, in press
- 18) Dorn-Wallenstein, T. Z., Levesque, E. M., Davenport, J. R. A., **Neugent, K, F.**, Morris, B. M., & Bostroem, K. A. 2022, “The Properties of Fast Yellow Pulsating Supergiants: FYPS Point the Way to Missing Red Supergiants,” ApJ, 940, 27
- 17) Aadland, E., Massey, P., Hillier, D. J., Morrell, N. I., **Neugent, K. F.**, & Eldridge, J. J., 2022, “WO-Type Wolf-Rayet Stars: the Last Hurrah of Massive Star Evolution,” ApJ, 931, 157
- 16) * Dimitrova, T. A., **Neugent K. F.**, Massey, P., & Levesque, E. M., 2021, “Locating Red Supergiants in the Galaxy NGC6822,” AJ, 163, 70
- 15) Massey, P., **Neugent, K. F.**, Dorn-Wallenstein, T. Z., Eldridge, J. J., Stanway, E. R., & Levesque, E. M., 2021, “Testing Evolutionary Models with Red Supergiant and Wolf-Rayet Populations,” ApJ, 922, 127
- 14) Massey, P., **Neugent, K. F.**, Levesque, E. M., Drout, M. R., Courteau, S., 2021, “The Red Supergiant Content of M31 and M33,” AJ, 161, 79
- 13) Dorn-Wallenstein, T. Z., Levesque, E. M., **Neugent, K. F.**, Davenport, J. R. A., Morris, B. M., & Gootkin, K., 2020, “Short Term Variability of Evolved Massive Stars with *TESS* II: A New Class of Cool, Pulsating Supergiants,” ApJ, 902, 24
- 12) Margon, B., Massey, P., **Neugent, K. F.**, & Morrell, N., 2020, “A Survey for C II Emission-Line Stars in the Large Magellanic Cloud,” ApJ, 898, 85
- 11) Massey, P., **Neugent, K. F.**, & Levesque, E. M., 2019, “The Discovery of Quasi-stellar Objects behind M31 and M33,” AJ, 157, 227
- 10) Aadland, E., Massey, P., **Neugent, K. F.**, & Drout, M. R., 2018, “Shedding Light on the Isolation of Luminous Blue Variables,” AJ, 156, 294
- 9) Massey, P., Levine, S. E., **Neugent, K. F.**, Levesque, E. M., Morrell, N. I., & Skiff, B., 2018, “A Runaway Giant in the Galactic Halo,” AJ, 156, 265

- 8) Massey, P., **Neugent, K. F.**, & Morrell, N. I. 2017, “A Modern Search for Wolf-Rayet Stars in the Magellanic Clouds. III. A Third Year of Discoveries,” *ApJ*, 837, 122
- 7) Massey, P., **Neugent, K. F.**, & Smart, B. M. 2016, “A Spectroscopic Survey of Massive Stars in M31 and M33,” *AJ*, 152, 62
- 6) Massey, P., **Neugent, K. F.**, & Morrell, N. I. 2015, “A Modern Search for Wolf-Rayet Stars in the Magellanic Clouds. II. A Second Year of Discoveries,” *ApJ*, 807, 81
- 5) Morrell, N. I., Massey, P., **Neugent, K. F.**, Penny, L. R., & Gies, D. R. 2014, “Photometric and Spectroscopic Studies of Massive Binaries in the Large Magellanic Cloud. II. Three O-type Systems in the 30 For Region,” *ApJ*, 789, 139
- 4) Massey, P., **Neugent, K. F.**, Morrell, N., & Hillier, D. J. 2014, “A Modern Search for Wolf-Rayet Stars in the Magellanic Clouds: First Results,” *ApJ*, 788, 83
- 3) Margutti, R., et al., inc. **Neugent, K. F.** 2014, “A Panchromatic View of the Restless SN 2009ip Reveals the Explosive Ejection of a Massive Star Envelope”, *ApJ*, 780, 21
- 2) Massey, P., **Neugent, K. F.**, Hillier, D. J., & Puls, J. 2013, “A Bake-off Between CMFGEN and FASTWIND: Modeling the Physical Properties of SMC and LMC O-type Stars,” *ApJ*, 768, 6
- 1) Massey, P., Morrell, N. I., **Neugent, K. F.**, Penny, L. R., DeGioia-Eastwood, K., & Gies, D. R. 2012, “Photometric and Spectroscopic Studies of Massive Binaries in the Large Magellanic Cloud. I. Introduction and Orbits for Two Detached Systems: Evidence for a Mass Discrepancy?” *ApJ*, 748, 96

■ Selected Non-Refereed Publications

* = Student I advised

- 13) *Dimitrova, T. A., **Neugent, K. F.**, Levesque, E. M., & Massey, P. 2020, “Locating Red Supergiants in the Galaxy IC10,” *RNAAS*, 4, 107
- 12) Slivan, S. M., **Neugent, K. F.**, Melton, C., & Beck, M. 2018, “Koronis Family Member (3032) Evans: Photometric Reconnaissance and Lightcurves in 2008, 2009, and 2016,” *Minor Planet Bulletin*, 45, 72
- 11) **Neugent, K. F.**, Massey, P., Hillier, D. J., & Morrell, N. I. 2017, “The Evolutionary Status of WN3/O3 Wolf-Rayet Stars,” *The Lives and Death-Throes of Massive Stars, Proceedings of the International Astronomical Union, IAU Symposium, Volume 329*, ed: J.J. Eldridge, pp. 176-180
- 10) Massey, P., Levesque, E., **Neugent, K. F.**, Evans, K., Drout, M. R., & Beck, M. 2017, “The Red Supergiant Content of the Local Group,” *The Lives and Death-Throes of Massive Stars, Proceedings of the International Astronomical Union, IAU Symposium, Volume 329*, ed: J.J. Eldridge, pp. 161-165
- 9) Massey, P., **Neugent, K. F.**, & Levesque, E. M. 2017, “The evolution of massive stars: bridging the gap in the Local Group,” *Philosophical Transactions of the RAS, Volume 375, Issue 2105*
- 8) **Neugent, K. F.**, Massey, P., Hillier, D. J., & Morrell, N. I. 2015, “The Discovery and Physical Parameterization of a New Type of Wolf-Rayet Star,” *Wolf-Rayet Stars: Proceedings of an International Workshop held in Potsdam, Germany, 1-5 June 2015*. Edited by Wolf-Rainer Hamann,

Andreas Sander, Helge Todt. Universitätsverlag Potsdam, 2015., p.101-104

- 7) Massey, P., **Neugent, K. F.**, & Morrell, N. I. 2015, "Finding Wolf-Rayet Stars in the Local Group," Wolf-Rayet Stars: Proceedings of an International Workshop held in Potsdam, Germany, 1-5 June 2015. Edited by Wolf-Rainer Hamann, Andreas Sander, Helge Todt. Universitätsverlag Potsdam, 2015., p.35-42
- 6) **Neugent, K. F.**, & Massey, P. 2015, "The Close Binary Frequency of Wolf-Rayet Stars as a Function of Metallicity in M31 and M33," New windows on massive stars: asteroseismology, interferometry, and spectropolarimetry, Proceedings of the International Astronomical Union, IAU Symposium, Volume 307, pp. 127-128
- 5) Massey, P., **Neugent, K. F.**, Morrell, N. I., & Hillier, D. J. 2015, "A New Class of Wolf-Rayet Stars: WN3/O3s," New windows on massive stars: asteroseismology, interferometry, and spectropolarimetry, Proceedings of the IAU Symposium, Volume 307, pp. 64-69
- 4) **Neugent, K. F.**, Massey, P., Meynet, G., & Georgy, C. 2013, "The Wolf-Rayet Content of Local Group Galaxies," Massive Stars: From α to Ω , held 10-14 June 2013 in Rhodes, Greece
- 3) Massey, P., **Neugent, K. F.**, Drout, M. R., & Meynet, G. 2013, "Yellow and Red Supergiants in the Local Group," Massive Stars: From α to Ω , held 10-14 June 2013 in Rhodes, Greece
- 2) Morrell, N., Herzog, M., Massey, P., & **Neugent, K. F.** 2013, "New spectroscopic study of NGC 3603 stars," Massive Stars: From α to Ω , held 10-14 June 2013 in Rhodes, Greece
- 1) **Neugent, K. F.**, & Slivan, S. M. 2008, "Rotation Periods and H Magnitudes of Two Koronis Family Members," Minor Planet Bulletin, 35, 116