

Research Interest

Galaxy Formation and Evolution, Resolved Stellar Populations, Dwarf Galaxies, Star Formation History, Galactic Structure, Near-Field Cosmology, Cosmic Reionization, Leakage of LyC, ISM, Stellar Feedback, Probabilistic Modeling

Education

Aug 2016 **Ph.D. in Astronomy**, *University of Washington*, USA.

Advisor: Dr. Julianne Dalcanton

Title: “Resolved Stars’ Insights into Galaxy Physics”

Aug 2011 **M.S. in Astronomy**, *University of Washington*, USA.

Feb 2009 **M.S. in Astronomy**, *Yonsei University*, South Korea.

Feb 2007 **B.S. in Astronomy**, *Yonsei University*, South Korea.

Research Experience

May 2018 – **SMASH Postdoctoral Research Associate**, *Montana State University/UA*, USA.

- Present - Continuing the SMASH Projects Including the SMC 3D Structure
- Searching for Stellar Components in the Leading Arm Using Gaia DR2
- Contributing to Measuring Spatially Resolved SFHs in the LMC/SMC

Sept 2016 – **SMASH Postdoctoral Research Associate**, *Steward Observatory/University of Arizona*, USA.
Apr 2018

Advisor: David Nidever & Knut Olsen

- Conducting Intensive Photometric Quality Assurance
- Constructing an Accurate 2D Reddening Map (165 deg²) of the LMC disk
- Mapping the 3D Structure of the LMC and Detecting an Outer Warp for the First Time
- Modeling the LMC Disk and Characterizing the Ring-like Stellar Overdensity

2012 – 2016 **Graduate Research Assistant**, *University of Washington*, USA.

Advisor: Julianne Dalcanton

- Measuring Spatially Resolved Star Formation History and Testing the Density Wave Theory in M81
- Modeling SEDs of Individual Stars in NGC 4214 and Measuring the Global Escape Fraction of LyC
- Modeling M31 Disk Using Both RGB Stars and WISE Images to Characterize the 10 kpc Ring

2009 – 2012 **Graduate Research Assistant**, *University of Washington*, USA.

Advisor: Zeljko Ivezic & Andrew Connolly

- Generating Difference Images for the SDSS Stripe 82 Data Using the LSST Software
- Constructing Difference Image Light Curves for QSOs/AGNs and Characterizing Their Optical Variability
- Verifying High Completeness and Efficiency of Variability-based AGN Selection

Jan 2008 – **Global Internship Researcher**, *ISAS/JAXA*, Japan.

Mar 2008 Mentor: Tomotsugu Goto

- Identifying E+A Galaxies from SDSS DR6 and Measuring their Fundamental Plane

2007 – 2009 **Research Assistant**, *Yonsei University*, South Korea.
 Advisor: Suk-Jin Yoon
 - Identifying UV-excess Early-type Galaxies from SDSS DR6 and GALEX DR4
 - Classifying Them Based on $H\alpha$ and $NUV - r$ and Measuring Their Fundamental Planes
 - Comparing Those with That of E+A Galaxies to Explore Evolutionary Connection

Awards & Scholarships

Winter 2015 **Jacobsen Fellowship**, *University of Washington*.
 Winter 2013 **Jacobsen Fellowship**, *University of Washington*.
 2013 **UW Graduate Student Travel Awards**, *University of Washington*.
 2013 **International Travel Grant**, AAS, USA.
 2008 **Global Internship Award at ISAS/JAXA in Japan**, *National Research Foundation of Korea*.
 2007 – 2009 **Brain Korea 21 Fellowship**, *National Research Foundation of Korea*.
 2003 – 2007 **Korea Science and Engineering Foundation Fellowship**, *National Research Foundation of Korea*.

Research Programs & Grants

HST **Securing HST's UV Legacy in the Local Volume: Probing Star Formation and the Interstellar Medium in Low Mass Galaxies**, *Cycle 25*, PI: K. Gilbert (GO-15275; 58 orbits).
 NSF **Survey of the MAgellanic Stellar History**, 2015, PI: D. Nidever (\$454k).
 HST **A Legacy Imaging Survey of M33**, *Cycle 24*, PI: J. Dalcanton (GO-14610; 108 orbits).
 HST **A New Method to Measure the UV Escape Fraction from Galaxies**, *Cycle 23*, PI: Y. Choi (AR-14288; \$70k).
 Chandra **A Large-scale Chandra Archive Study of the X-ray Activity of Optically-variable Galaxies**, *Cycle 13*, PI: R. Gibson (\$80k).

Refereed Publications ([ADS Listing](#))

- [15] 2018 **Choi, Yumi** et al., “Mapping the Escape Fraction of Ionizing Photons Using Resolved Stars: A Much Higher Escape Fraction for NGC 4214”, will be submitted in November 2018
- [14] 2018 Nidever, D. L.; Olsen, K.; **Choi, Yumi** et al., “Exploring the Very Extended Low Surface Brightness Stellar Populations of the Large Magellanic Cloud with SMASH”, submitted to ApJ ([arXiv:1805.02671](#))
- [13] 2018 **Choi, Yumi** et al., “SMASHing THE LMC: Mapping A Ring-like Stellar Overdensity in the LMC Disk”, submitted to ApJ ([arXiv:1805.00481](#))
- [12] 2018 Dey, A. et al. including **Choi, Yumi**, “Overview of the DESI Legacy Imaging Surveys”, submitted to AJ ([arXiv:1804.08657](#))
- [11] 2018 **Choi, Yumi** et al., “SMASHing the LMC: A Tidally-induced Warp in the Outer LMC and a Large Scale Reddening Map”, 2018, ApJ, 866,90
- [10] 2018 Martínez-Delgado, D. et al. including **Choi, Yumi**, “A Shell of Young Stars in the Outskirts of the Small Magellanic Cloud”, submitted to MNRAS
- [9] 2017 Nidever, D. L. et al. including **Choi, Yumi**, “SMASH: Survey of the MAgellanic Stellar History”, 2017, AJ, 154, 199

- [8] 2017 Williams, B. et al. including **Choi, Yumi**, “PHAT. XIX. The Ancient Star Formation History of the M31 Disk”, 2017, ApJ, 846, 145
- [7] 2017 Yukita, M. et al. including **Choi, Yumi**, “Identification of the Hard X-ray Source Dominating the $E > 25$ keV Emission of the Nearby Galaxy M31”, 2017, ApJ, 838, 47
- [6] 2016 Gordon, K. D. et al. including **Choi, Yumi**, “The Panchromatic Hubble Andromeda Treasury. XV. The BEAST: Bayesian Extinction and Stellar Tool”, 2016, ApJ, 826, 104
- [5] 2015 **Choi, Yumi** et al., “Testing Density Wave Theory with Resolved Stellar Populations around Spiral Arms in M81”, 2015, ApJ, 810, 9
- [4] 2015 Lewis, A. R. et al. including **Choi, Yumi**, “The Panchromatic Hubble Andromeda Treasury. XI. The Spatially Resolved Recent Star Formation History of M31”, 2015, ApJ, 805, 183
- [3] 2014 **Choi, Yumi** et al., “Variability-based Active Galactic Nucleus Selection Using Image Subtraction in the SDSS and LSST Era”, 2014, ApJ, 782, 37
- [2] 2009 **Choi, Yumi** et al., “The Fundamental Planes of E+A Galaxies and GALEX UV-excess Early-type Galaxies: Revealing Their Intimate Connection”, 2009, MNRAS, 395, 637
- [1] 2006 Kim, J.-W., **Choi, Yumi** et al., “Red Giant Branch of the Metal Poor Globular Clusters: II. Bump, Tip, and Distance of NGC 1904”, 2006, JASS, 23, 97

Talks and Presentations

- June 2018 “SMASHing the LMC”, Workshop: Near-Field Cosmology With DES DR1 and Beyond, University of Chicago
- June 2018 “SMASHing the Large Magellanic Cloud: dust map and galactic structures around the LMC”, Journal Club Seminar, UC San Diego
- May 2018 “A Ring-like Stellar Overdensity Structure in the Large Magellanic Cloud”, Galactic Rings: Signposts of Secular Evolution in Disk Galaxies, University of Alabama
- Sep 2017 “Stellar Overdensity in the Southern Disk of the LMC”, 5th GMT Community Science Meeting, New York
- Jan 2017 “The Survey of the MAgellanic Stellar History (SMASH): Tracing Stellar Structures in the southern disk of LMC”, 229th AAS, Grapevine
- Oct 2016 “Resolved Stars’ Insights into Galaxy Physics: (1) Mapping fesc for NGC 4214, (2) Testing density wave theory in M81, and (3) Tracing stellar structures in M31”, Flash Talk, NOAO
- Mar 2016 “A New Method to Measure the LyC Escape Fraction from Galaxies: the escape fraction for NGC 4214”, Aspen Center for Physics
- May 2015 “Escape fraction of ionizing photons from a dwarf galaxy NGC 4214”, The Olympian symposium on cosmology and the epoch of reionization, Greece
- Jan 2015 “Escape fraction of ionizing photons from a dwarf galaxy NGC 4214”, 225th AAS, Seattle
- Aug 2014 “The Power of Panchromatic Imaging: Intrinsic UV flux and its leakage from NGC4214”, Lyman Continuum Leakage and Cosmic Reionization, AlbaNova University Center, Sweden
- Oct 2013 “Testing Density Wave Theory with Stellar Populations around Spiral Arms in M81”, The 7th Korean Astrophysics workshop on Dynamics of disk galaxies, Seoul National University, South Korea
- Jan 2013 “Identifying QSOs/AGNs by Variability Seen in Difference Images”, 221st AAS, Long Beach
- Jan 2011 “A Difference-Imaging Survey for AGN in Stripe 82”, 217th AAS, Seattle
- Jan 2009 “The Possible Evolutionary Connection between E+A Galaxies and GALEX UV-excess Early-type Galaxies”, 213th AAS, Long Beach

Professional Activities

Referee The Astronomical Journal
Panel *Swift* review
Full Member American Astronomical Society

Teaching Experience

TA Astronomy 101, Spring 2010 & Winter 2011, UW
TA The Planets, Fall 2010, UW
TA Exploring the Universe, Fall 2007, Yonsei University
TA Astrophysics I, Spring 2007, Yonsei University

Computer Skills

Language fluent in python and IDL
Software MATCH (deriving SFH), BEAST (stellar SED fitting), GALFIT (modeling objects in 2D), MySQL, Condor