Raymond P. Remigio

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Research Interests

Supermassive black holes in the early Universe, *Increase our understanding of the physical mechanisms that drive the rapid growth of supermassive black holes in the epoch of reionization by combining data across multi-wavelength observations*.

Co-evolution of supermassive black holes and their host galaxies, Investigating the complex interplay between supermassive black holes and their host galaxies using spectroscopic data of nearby active galaxies.

Integral-field spectroscopy, Developing software and routines for the reduction and analysis of spectroscopic data. Leveraging the capabilities of integral-field spectroscopy to simultaneously obtain the morphology and spatially resolved kinematics of gas and dust in and around galaxies.

Education

2020–present **PhD, Physics with Concentration in Astronomy & Astrophysics**, *University of California, Irvine*, Advisor: Aaron J. Barth, Co-advisor: Vivian U.
Thesis: Spatially Resolved Kinematics of the Gas in AGN Environments with Keck/KCWI

2018–2020 **MSc, Astronomy**, *San Diego State University*, Advisor: Robert M. Quimby.
Thesis: Catching the Post-Shock Cooling Peak of SN 2016gkg with Evryscope

2016–2017 **MSc, Aerospace Engineering**, *University of California, San Diego*.

2011–2015 **BSc, Physics**, *University of California, Santa Barbara*.
Minor: Astronomy and Planetary Science

Fellowships & Awards

January 2026 – June 2026 **Graduate Assistantship in Areas of National Need (GAANN) Fellowship** as a PhD Candidate at University of California, Irvine

2019 – 2020 **Ruth and Clifford Smith Astronomy Fellowship** as a MSc Student at San Diego State University

Observing Experience

Keck/KCWI *Lyman-α halos of quasars in the epoch of reionization*, 3 nights as Co-I 2025A–2025B

Keck/KCWI *Lyman-α halos of the most distant quasars*, 5 nights as Co-I, 2023B–2024B

Keck/KCWI *Calibrating the $M_{\rm BH}$–σ Relation with Spatially-Resolved Kinematics of RM AGN Host Galaxies*, 4 nights as Co-I, 2023B–2024A.

Mount Laguna Observatory/1.0 m, remote photometric observations and on-site spectroscopic observations

Publications

First Author

R.P. Remigio, A.J. Barth, F. Wang, et al., "Detection of an Extended Lyα Halo around a $z = 6.64$ Broad Absorption Line Quasar with the Keck Cosmic Web Imager", *in prep.*

R.P. Remigio, V. U, A.J. Barth, et al., "Spatially Resolved [O III] Emission Line Kinematics of Reverberation-Mapped AGNs with the Keck Cosmic Web Imager," *The Astrophysical Journal*, Volume 992, Issue 1, id.42, October 2025.

Contributing Author

N. Winkel, V.N. Bennert, **R.P. Remigio**, et al., "Combining Direct Black Hole Mass Measurements and Spatially Resolved Kinematics to Calibrate the $M_{\rm BH}$–$\sigma_\star$ Relation of Active Galaxies," *The Astrophysical Journal*, Volume 978, Issue 1, id.115, January 2025.

V. U, T. Lai, M. Bianchin, **R.P. Remigio**, et al., "GOALS-JWST: Resolving the Circumnuclear Gas Dynamics in NGC 7469 in the Mid-infrared", *The Astrophysical Journal Letters*, Volume 940, Issue 1, id.L5, November 2022.

J.A. Kader, V. U, J. Rich, et al., "Shockingly Effective: Cluster Winds as Engines of Feedback in Starburst Galaxy VV 114," *The Astrophysical Journal*, Volume 988, Issue 2, id.230, August 2025.

M. Bianchin, V. U, Y. Song, et al., "GOALS-JWST: Gas Dynamics and Excitation in NGC 7469 Revealed by NIRSpec," *The Astrophysical Journal*, Volume 965, Issue 2, id.103, April 2024.

J. Montano, H. Guo, A.J. Barth, et al., "Optical Continuum Reverberation in the Dwarf Seyfert Nucleus of NGC 4395," *The Astrophysical Journal Letters*, Volume 934, Issue 2, id.L37, August 2022.

H. Guo, A.J. Barth, K.T. Korista et al., "The Paschen Jump as a Diagnostic of the Diffuse Nebular Continuum Emission in Active Galactic Nuclei," *The Astrophysical Journal*, Volume 927, Issue 1, id.60, March 2022.

H. Cho, J-H Woo, T. Treu et al., "Hα Reverberation Mapping of the Intermediate-mass Active Galactic Nucleus in NGC 4395," *The Astrophysical Journal*, Volume 921, Issue 2, id.98, November 2021.

J.A. Kader, V. U, L. Barcos-Muñoz, et al., "The Past, Present, and Future of a Precessing Jet-Driven Outflow in a Late-Type Disk Galaxy," *Science, accepted and embargoed*

V.N. Bennert, N. Winkel, T. Treu, et al., "The Host Galaxies of Active Galactic Nuclei with Direct Black Hole Mass Measurements," *The Astrophysical Journal*, *in revision*

Y. Song, V. U, J. Kader, et al., "The Multi-phase Biconical Outflow in the local IR-Luminous Merger IRASF01364-1042," *submitted to Astronomy & Astrophysics*

Conferences

Contributed Talks

Searching for Extended Lyα Emission around High-z Quasars with Keck/KCWI, *EREBUS/JWST Workshop*, Hilo, HI, 2024

Probing the Lyα halos of the most distant quasars with Keck/KCWI, *EREBUS/JWST Workshop*, Tucson, AZ, 2023

Posters

Searching for Extended Lyα Emission around High-z Quasars with Keck/KCWI, *Keck Science Meeting*, Los Angeles, CA, 2025

Searching for Extended Lyα Emission around High-z Quasars with Keck/KCWI, *Keck Science Meeting*, Pasadena, CA, 2024

Spatially Resolved [O III] Emission Line Kinematics of Reverberation-Mapped AGN with the Keck Cosmic Web Imager, *Keck Science Meeting*, Pasadena, CA, 2024

Spatially Resolved [O III] Emission Line Kinematics of Reverberation-Mapped AGN with KCWI, *AAS 241*, Seattle, WA, 2023

Spatially Resolved [O III] Emission Line Kinematics of Reverberation-Mapped AGN with KCWI, *Keck Science Meeting*, Pasadena, CA, 2022

Teaching and Outreach

2022–2025 **Summer Session Instructor**, *Classical Physics Lab (Electricity and Magnetism)*, University of California, Irvine

2023 **Summer Session Instructor**, *Introduction to Astronomy*, University of California, Irvine

2020–2025 **Teaching Assistant**, Department of Physics and Astronomy, University of California, Irvine

2019–2020 **Mount Laguna Observatory Summer Visitors' Program**, Department of Astronomy, San Diego State University

2018–2020 **Teaching Associate**, Department of Physics, San Diego State University

Winter 2017 – Spring 2017 **Teaching Assistant**, Department of Physics, University of California, San Diego

Fall 2016 **Teaching Assistant**, Department of Mathematics, University of California, San Diego

Other Research Experience

2018–2020 **Graduate Research Assistant**, *San Diego State University*.
Advisor: Robert M. Quimby. Developed an image-subtraction routine to search for transients with Evryscope-North. Helped develop a Python routine to use an all-sky camera as a cloud sensor. Updated the periodic tracking error for the Mount Laguna Observatory 1.0 m telescope.

2019–2020 **Graduate Research Assistant**, *San Diego State University*.
Advisor: Douglas C. Leonard. Re-commissioned the spectrograph as a working instrument on the Mount Laguna Observatory 1.0 m telescope. Conducted long-slit spectroscopic observations of Betelgeuse during the "Great Dimming Event."