



Exponent[®]
Engineering & Scientific Consulting

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Professional Profile

Yasmin Homayouni, Ph.D., is a Physicist and Applied Data Scientist at Exponent with more than 8 years of experience designing and executing complex experiments, conducting advanced statistical and time-series analysis on large-scale datasets.

Dr. Homayouni has led several projects analyzing time-series data to study variability in complex systems, quantifying trends, applying statistical analysis and modeling to extract meaningful signals and interpret system behavior. She has also built Python-based pipelines to automate data preparation and analysis across large datasets, including data cleaning, integration, time-series calibration, and model validation.

Dr. Homayouni has also served as the Principal Investigator on federally funded observing programs with the Hubble Space Telescope, leading the scientific strategy, execution, and reporting of complex observational research programs. In this role, she oversaw all phases of the projects, from observation planning and data acquisition to analysis and reporting to NASA.

Prior to joining Exponent, Dr. Homayouni was an Eberly Postdoctoral Fellow at Penn State University, where she analyzed multi-year data from the Sloan Digital Sky Survey (SDSS) to identify factors influencing measurement success in time-domain studies and assess the impact of data quality, uncertainty, and methodological choices on survey design and scientific decision-making.

Before joining Penn State University, Dr. Homayouni was a postdoctoral researcher at the Space Telescope Science Institute (STScI), where she contributed to the calibration and processing of Hubble data, assessed data quality to improve the reliability of downstream analyses, and collaborated with instrument scientists to enhance a Python-based data reduction pipeline supporting high-resolution observations with the Cosmic Origins Spectrograph. She also served as Executive Officer for an international collaboration of 70 researchers, coordinating scientific priorities, communications, and schedules across the team to ensure timely achievement of project milestones.

Dr. Homayouni's Ph.D. thesis focused on using time-series analysis to study the inner environments of supermassive black holes.

Academic Credentials & Professional Honors

Ph.D., Physics, University of Connecticut, 2021

M.S., Theoretical Physics, University of Tehran, 2013

B.S., Physics, University of Tabriz, Iran, 2010

Rising Researcher, Penn State Institute for Computational and Data Sciences, 2025

Future Leader, Association of Universities for Research in Astronomy, 2024

Member of American Astronomical Society (AAS), 2018 -2024

Prior Experience

Eberly Postdoctoral Fellow, Astronomy and Astrophysics, Pennsylvania State University, 2022 – 2026

Postdoctoral Researcher, Space Telescope Science Institute, 2021 – 2022

Publications

Homayouni Y, Jiang Y, Brandt WN, Grier CJ, Trump JR, Shen Y, Horne K, Hall PB, Anderson SF, Ho LC, Schneider DP. [The Sloan digital sky survey reverberation mapping project: insights on maximizing efficiency in lag measurements and black-hole masses](#). Astrophysical Journal 2025; 987(155).

Homayouni Y, Kriss GA, De Rosa G, Plesha R, Cackett EM, Goad MR, Korista KT, Horne K, the AGN STORM 2 Team. [AGN STORM 2. V. anomalous behavior of the C IV light curve of Mrk 817](#). Astrophysical Journal 2024; 963(123).

Homayouni Y, De Rosa G, Plesha R, Kriss GA, Barth AJ, Cackett EM, Horne K, Kara E, Landt H, the AGN STORM 2 Team. [AGN STORM 2: II. Ultraviolet observations of Mrk817 with the cosmic origins spectrograph on the Hubble Space Telescope](#). Astrophysical Journal 2023; 948(85).

Homayouni Y, Sturm M, Trump JR, Horne K, Grier CJ, Shen Y, Brandt WN, Fonseca Alvarez G, Hall PB, Ho LC, Li J, Sun M, Schneider DP. [The Sloan digital sky survey reverberation mapping project: UV-Optical accretion disk measurements with Hubble Space Telescope](#). Astrophysical Journal 2022; 926(225).

Homayouni Y, Trump JR, Grier CJ, Horne K, Shen Y, Brandt WN, Dawson KS, Fonseca Alvarez G, Green P, Hall PB, Hernandez Santisteban JV, Ho LC, Kinemuchi K, Kochanek CS, Li J, Peterson BM, Schneider DP, Starkey DA, Bizyaev D, Kaike P. [The Sloan digital sky survey reverberation mapping project: MgII lag results from four years of monitoring](#). Astrophysical Journal 2020; 901(55).

Homayouni Y, Trump JR, Grier CJ, Shen Y, Starkey DA, Brandt WN, Fonseca Alvarez G, Hall PB, Horne K, Kinemuchi K, Li J, McGreer I, Sun M, Ho LC, Schneider DP. [The Sloan digital sky survey reverberation mapping project: accretion disk sizes from continuum lags](#). Astrophysical Journal 2019; 880(126).

Presentations

Homayouni Y. Census of black hole accretion structure and mass. University of Maryland Baltimore County, Invited Talk, Colloquium, Baltimore, 2025.

Homayouni Y. Census of black hole accretion structure and mass. Caltech/IPAC, Oral Presentation, Pasadena, 2025.

Homayouni Y. Prospects of photometric and spectroscopic reverberation mapping surveys with Rubin. 245th Meeting of American Astronomical Society, Oral Presentation, DC, 2025.

Homayouni Y, Jiang Y, Brandt WN. Sloan digital sky survey reverberation mapping project: insights on maximizing efficiency in lag measurements. 245th Meeting of American Astronomical Society, Oral Presentation, DC, 2025.

Homayouni Y. Census of black hole accretion structure and mass. American Physical Society Mid-Atlantic Section, Invited Talk, Philadelphia, 2024.

Homayouni Y. Reverberation mapping the inner environments of supermassive black holes. University of Wisconsin- Madison Colloquium, Invited Talk, Colloquium, Madison, 2023.

Homayouni Y. Peering into the Maelstrom: the broad line regions of active galactic nuclei", Cote d'Azur University, AGN Meeting, Invited Talk, Nice, 2023.

Homayouni Y. Space telescope and optical reverberation mapping project 2: broad line lags from UV emission line reverberation mapping of Mrk817. 19th High Energy Astrophysics Division Meeting of American Astronomical Society, Oral Presentation, 2022.

Research Grants

A fundamental test of black hole masses: ultraviolet echo mapping the multi-scale broad line gas around quasars. Hubble Space Telescope, NASA, 2023.

Ultraviolet echoes of quasar accretion disks. Hubble Space Telescope, NASA, 2018.

Peer Reviews

Reviewer for Astrophysical Journal, Astronomy & Astrophysics, and Monthly Notices of Royal Astronomical Society

Served as an External Panelist for Time Allocation Committees of the James Webb Space Telescope and Canada-France-Hawaii Telescope

Scientific Organizing Committee Member, Large-Volume Spectroscopy Workshop, Space Telescope Science Institute