

Ekta Patel, PhD

Hubble Fellow | University of Utah

✉ ekta.patel@utah.edu • 🌐 ektapatelastro.com • 🇺🇸 Citizenship: USA

Research Interests: Near-field cosmology, satellite galaxies, dwarf galaxies, computational astrophysics

Education

University of Arizona

M.S., Ph.D. in Astronomy & Astrophysics

Thesis: "Dynamics of Local Group Satellite Galaxies in the Era of Precision Astrometry"

Advisor: Dr. Gurtina Besla

Tucson, AZ

2017, 2019

New York University

B.A. in Physics (with Honors)

Senior Honors Thesis: "The Sloan Digital Sky Survey Large Galaxy Atlas"

Advisor: Dr. David Hogg

New York, NY

2014

Appointments

Hubble Fellow | August 2023–Present

Department of Physics & Astronomy, University of Utah

Postdoctoral Fellow | August 2022–2023

Department of Astronomy, University of California, Berkeley

Miller Research Fellow | August 2019–2022

Miller Institute for Basic Research in Science, University of California, Berkeley

Honors, Awards, and Professional Affiliations

2023-2026 NASA Hubble Fellowship

2019-2022 Miller Research Fellowship, Miller Institute for Basic Research in Science

2019 Division of Dynamical Astronomy Raynor L. Duncombe Student Research Prize

2019 National Science Foundation Astronomy & Astrophysics Postdoc Fellowship Recipient (Declined)

2016-2019 National Science Foundation Graduate Research Fellowship Recipient

2016 University of Arizona College of Science Service Award Recipient

2015 Ford Foundation Pre-Doctoral Fellowship Honorable Mention and Alternate Candidate

2014 Sigma Pi Sigma National Physics Honors Society Initiate

Publications

[see my full list of publications on ADS here]

32 journal articles, 5 white papers/proceedings, 4 in preparation

7 as 1st/corresponding author, 10 as 2nd/3rd author

h-index: 15

Selected Press & Media Features

2024 Sky & Telescope, [Astronomers Find 100,000 Light-Year Bow Shock in the Milky Way's Outskirts](#)

- 2022 Discover Magazine, [Our Galaxy is on a Collision Course. And It's Not the First Time](#)
- 2022 Scientific American, [Women Are Creating a New Culture for Astronomy](#)
- 2021 Sky & Telescope, [How Our Largest Dwarf Galaxy Keeps the Others in Line](#)
- 2021 Miller Institute Newsletter, [Spring 2021 Miller Fellow Focus: Ekta Patel](#)
- 2020 STEAM Squad Curriculum Book - Blasts Off!, [Meet Ekta Patel, Ph.D.](#)
- 2019 European Space Agency, [Gaia clocks new speeds for Milky Way-Andromeda collision](#)
- 2019 The New York Times, [Andromeda Is Coming for Our Milky Way Galaxy, Eventually](#)
- 2019 Astronomy Magazine Ask Astro Column Response, [Will the Pinwheel Galaxy \(M33\) merge with the Andromeda Galaxy \(M31\) prior to Andromeda merging with the Milky Way?](#)
- 2019 National Geographic, [Our galaxy is due to crash into its neighbor—but when?](#)
- 2019 Space.com, [We Finally Know When Our Milky Way Will Crash Into the Andromeda Galaxy](#)
- 2019 Active Galactic Women of Discovery Series, [Galaxy Evolution with Ekta Patel](#)
- 2019 LiveScience.com, [How Massive is the Milky Way?](#)
- 2018 University of Arizona Press Release, [How do you Weigh a Galaxy? Especially the One You're In?](#)
- 2018 Air & Space Magazine, [How to Weigh a Galaxy](#)
- 2018 International Business Times, [Milky Way's Mass Estimated More Reliably Using Satellite Galaxies Angular Momentum](#)
- 2018 Nature Research Highlights, [Measuring the Milky Way's mind-boggling mass](#)
- 2018 American Astronomical Society Nova, [Using Satellite Galaxies to Weigh the Milky Way](#)
- 2018 Space.com, [Milky Weigh: New Method Pins Down Our Galaxy's Mass](#)
- 2018 Astronomy Magazine, [A whole new way to weigh the Milky Way](#)

Selected Talks & Presentations

Invited: 26.....

- Apr 2024 Space Telescope Science Institute Galaxies/AGN Journal Club
- Feb 2024 XMC Milky Clouds Over Manhattan Workshop, Keynote
- Jan 2024 UCSD Astronomy & Astrophysics Colloquium
- Oct 2023 University of Utah HEAP/PER Seminar
- Nov 2022 University of Virginia/NRAO Colloquium
- Feb 2022 Carnegie Observatories Lunch Talk Seminar Series
- Feb 2022 University of Florida Astronomy Colloquium
- Feb 2022 University of Maryland Astronomy Colloquium
- Nov 2021 Miller Institute Lunch Seminar
- Jun 2021 Space Telescope Science Institute ISM* Seminar
- Apr 2021 New York University Center for Cosmology and Particle Physics Astro Seminar
- Apr 2021 University of Michigan Astronomy Colloquium
- Feb 2021 University of California, Santa Cruz Astronomy Colloquium
- Feb 2021 University of Oklahoma Astronomy Colloquium
- Nov 2020 University of California, Berkeley Astrophysics Roundtable on Near-field Cosmology
- Nov 2020 Yale University Astronomy Colloquium
- Oct 2020 Princeton University Institute for Advanced Study Seminar
- Sep 2020 Rutgers University Astrophysics Seminar
- Sep 2020 University of California, Berkeley Astronomy Colloquium
- Mar 2020 Las Cumbres Observatory Seminar
- Jun 2019 Division of Dynamical Astronomy Raynor L. Duncombe Student Research Prize Talk
- Nov 2018 Ohio State University Center for Cosmology and Astroparticle Physics Seminar
- Oct 2018 University of California, Berkeley Astronomy Department Lunch Talk
- Oct 2018 American Museum of Natural History Astrophysics Seminar, New York, NY
- Jul 2018 PHAT Collaboration Team Meeting, Ringberg Castle

Jun 2018 [232nd American Astronomical Society Meeting Press Conference](#), Denver, CO

Contributed Conference Presentations: 14.....

Jan 2024 The Milky Way is Not an Island: The Halo of the Galaxy and its Satellites, Sexten, Italy
Oct 2023 NASA Hubble Fellowship Program Symposium
Mar 2023 IAUS379: Dynamical Masses of Local Group Galaxies
Nov 2022 Linking the Galactic and Extragalactic, Australia
Aug 2022 IAU General Assembly Division H Meeting, South Korea
Dec 2020 [Linking the Galactic and Extragalactic \(virtual\) *](#), Australia (*runner-up for best contributed talk)
Sep 2020 The Local Group: Assembly and Evolution, Space Telescope Science Institute
Nov 2019 Bay Area Local Group Meeting, Kavli Institute/SLAC National Accelerator Laboratory
Jul 2019 Small Galaxies, Cosmic Questions, Durham University, United Kingdom
Jun 2018 232nd American Astronomical Society Meeting, Milky Way Session 402, Denver, CO
Jul 2017 Large Surveys of the Great Andromeda Galaxy, Lorentz Center, Netherlands
Apr 2017 Marc Aaronson Symposium, University of (poster)
Jun 2015 Local Group Astrostatistics Conference, University of Michigan (poster)
Jan 2014 Midwest Conference for Undergraduate Women in Physics, University of Chicago (poster)

Other Talks: 6.....

Dec 2019 University of California, Berkeley Astronomy Department Lunch Talk
Apr 2018 University of Texas at Austin ExGal Seminar
Dec 2017 University of Colorado JILA Seminar
Oct 2017 Columbia University Galaxies Lunch Seminar
Dec 2016 Space Telescope Science Institute Galaxy Club
Nov 2016 National Optical Astronomy Observatory FLASH Talk

Telescope Time Awarded

As Principal Investigator: 2

HST Cycle 31, *Beyond PAndAS: Two Extremely Faint Candidate Satellites of M33 Identified in Diffuse Light*, GO 17484, 2 orbits (\$57,178)

HST Cycle 29, *Establishing a New Framework for Quantifying Quenching in Low-Mass Satellite Galaxies using Gaia and HST*, AR 16628 (\$205,049)

As Co-Investigator: 13

HST Cycle 31, *Shedding Light on Dark Matter: Internal Proper Motions in Ursa Minor*, GO 17434, PI: E. Vitral, 16 orbits

HST Cycle 31, *Lone Lion or Part of a Pride: Proper Motion and Orbit of Leo P*, GO 17501, PI: P. Bennet, 16 orbits

HST Cycle 31, *Proper Motions of Galaxies in the M81 Group: Unleashing the Full Power of HST's 20-year Time Baseline*, GO 17513, PI: P. Bennet, 42 orbits

Gemini S22B, *Follow-ups for M33 Dwarf Satellite Galaxies Search*, GN-2022B-Q-231, PI: Q. Liu, 8.3hr

HST Cycle 30, *New Kids on the Block? Proper Motions of First Infall Galaxies in the Local Group*, GO 17174, PI: P. Bennet, 28 orbits

HST Cycle 29, *Internal Proper Motion Kinematics of Dwarf Spheroidal Galaxies: Constraining the Density and Properties of Dark Matter*, GO 16737, PI: S.T. Sohn, 20 orbits

- HST Cycle 29**, *The Panchromatic Hubble Andromeda Southern Treasury (PHAST)*, GO 16778, PI: B. Williams, 195 orbits
- HST Cycle 28**, *Near Field Cosmology with Ultra-faint Dwarfs: Patchy Reionization and Sub-Solar Initial Mass Function*, GO 16293, PI: Y. Choi, 5 orbits
- HST Cycle 28**, *Resolved Proper Motions of M33*, GO 16274, PIs: S.T. Sohn & M. Fardal, 25 orbits
- HST Cycle 28**, *Andromeda and the Seven Dwarfs: M31 Mass, Satellite Orbits, and the Nature of the Satellite Plane*, GO 16273, PI: S.T. Sohn, 48 orbits
- HST Cycle 27**, *Tracing the 6-D Orbital and Formation History of the Complete M31 Satellite System*, GO 15902, PI: D. Weisz, 244 orbits
- HST Cycle 27**, *Orbits of Isolated Dwarfs: Local Group Mass and Environmental Quenching*, GO 15911, PI: A. del Pino, 20 orbits
- HST Cycle 26**, *Resolved Proper Motions of M31 and the M31-M32 Interaction*, GO 15658, PI: S. T. Sohn, 35 orbits

Science Communication

Invited Public Presentations: 11.....

- 2024 Astronomy on Tap, Los Angeles
- 2024 Astronomy on Tap, Salt Lake City
- 2021 [Satellite Galaxies in the Local Group](#), Eastbay Astronomical Society 2020
- 2020 [Satellite Galaxies in the Local Group](#), UC Berkeley Astronomy Night
- 2020 [Satellite Galaxies in the Local Group](#), Mount Diablo Astronomical Society
- 2020 [Satellite Galaxies in the Local Group](#), San Francisco Amateur Astronomers
- 2020 Satellite Galaxies in the Local Group, San Mateo County Astronomical Society
- 2019 Satellite Galaxies in the Local Group, Huachuca Astronomical Society
- 2018 Satellite Galaxies and Dwarfs in the Local Group, Sonora Astronomical Society
- 2018 [Estimating the Mass of the Milky Way Using Satellite Galaxies](#), 232nd American Astronomical Society Meeting Press Conference
- 2017 Satellite Galaxies and Dwarfs in the Local Group, Tucson Amateur Astronomy Association

Community Engagement.....

- **Rowland Hall - 8th Grade Science Visit**
Speaker | 2024
 - Discussed my career path and area of research, followed by Q & A with 8th grade science students in Salt Lake City, UT
- **Meet a Miller Fellow × El Cerrito High School**
Speaker | 2020–2021
 - Participate in virtual visits to high school physics and environmental science classes aimed at humanizing science by highlighting scientific career paths and modern areas of research
- **University of California, Santa Cruz Lamat Program**
Speaker | 2020
 - Discussed my career path and area of research in the *Meeting of the Minds* series with California community college students participating in the Lamat summer research program
- **National Optical Astronomy Observatory (now NOIRLab)**
Teen Astronomy Cafe
Speaker & Instructor | 2018–2019

- Designed and presented an original 40 minute research talk entitled *Galactic Archaeology: From Little to Big* accessible to high school students in Tucson, AZ
- Designed and facilitated a 40 minute activity applying skills in basic computer programming, data visualization, and graph interpretation to determine the collision timescale of the Milky Way and Andromeda galaxies

Project ASTRO

Classroom Astronomer | 2015–2017

- Paired with a local elementary (2015-2016) and high school (2016-2017) teachers to bring astronomy themed hands-on activities to students in the classroom

o **Academy of Tucson High School**

Keynote Speaker | 2018

- Gave a keynote speech at the Academy of Tucson High School's Class of 2018 graduation

o **Colors of Nature Summer Academy Tucson**

Instructor | 2017–2018

- Arizona-Sonora Desert Museum (2017, 2018): Co-instructed a one week summer academy for middle school students to explore the science of color in nature through both scientific and artistic lenses
- Kitt Peak, AZ (2018): Co-instructed a one week summer academy specifically for middle school girls of the Tohono O'odham Nation, the Indigenous people of the Sonoran Desert

Leadership & Service Experience

Leadership Experience.....

o **UC Berkeley Astronomy Department**

Cal-URSA (Undergraduate Research Scholarships in Astronomy)

Lead Developer & Coordinator | 2021

- Develop a paid, semester-long undergraduate research opportunity for Bay Area students majoring in physics and astronomy, especially those individuals who identify with groups that have been historically excluded from STEM, to work on scientific research at UC Berkeley Astronomy
- Request and secure funds from UC Berkeley Department of Astronomy
- Solicit project submissions from UC Berkeley postdocs and research staff
- Advertise and evaluate candidate applications using an equitable and inclusive process
- Coordinate hiring logistics and organize professional development events for inaugural cohort of students

Postdoc Representative | 2020–2021

- Serve as a liaison between postdoctoral scholars and department leadership
- Attend bi-weekly meetings to communicate requests from the postdoc community and receive department updates
- Organize once per semester town halls to collect feedback from the postdoc community

Diversity, Equity, Inclusion, & Climate Committee

Postdoc Representative | 2020–2021

- Work with faculty, students, postdocs, and staff to outline recommendations addressing representation and support networks for individuals belonging to marginalized groups in astronomy
- Contribute to the development of a climate advisors program to promote positive department culture

o **Miller Institute for Basic Research in Science**

Diversity, Equity, and Inclusion Working Group Member | 2020–2022

- Work with Miller Research Fellows and faculty to provide recommendations for improving the overall climate and hiring practices at the Miller Institute
- Contribute to the development of the Meet a Miller Fellow × El Cerrito High School community outreach program

- o **University of Arizona Department of Astronomy and Steward Observatory**

Graduate Council Member | 2015–2017

- Acted as a liaison between astronomy graduate students and faculty, including department leadership
- Launched a seminar series highlighting non-academic career trajectories

Mentoring & Academic Support

- o **I have served as a scientific mentor for the following students:**

1. Tadh Noland, Undergraduate Student (U of Utah)
Undergraduate Research Opportunity Program – Summer 2024
Project: Constraining M32's Orbital History with Hubble Space Telescope Proper Motions (ongoing)
2. Lipika Chatur, Undergraduate Student (UT Austin)
Project: Temporal Evolution of the Radial Distribution of Milky Way Satellite Galaxies (submitted to ApJ)
3. Elaheh Hayati, PhD Student (University of Arizona)
Project 1: Machine Learning the Dark Matter Halo Mass of Milky Way-Like Systems (OJoA, 2024)
Project 2: Using Machine Learning to Estimate the Masses of the Milky Way and Andromeda (ongoing)
4. Katie Chamberlain, PhD Student (University of Arizona)
Project 1: A new framework for recovering the mass and redshift dependence of galaxy pair fractions across cosmic time (ApJ, 2024)
Project 2: Orbital Characteristics and Merger Timescales for Isolated Dwarf Pairs in IllustrisTNG (submitted to ApJ)
5. David Setton, PhD (University of Pittsburgh), now at Princeton University
Project: The Large Magellanic Cloud's ~ 30 Kiloparsec Bow Shock and its Impact on the Circumgalactic Medium (ApJL, 2024)
6. Hannah Richstein, PhD Student (University of Virginia)
Project: Structural parameters and possible association of the UFDs Pegasus III and Pisces II (ApJ, 2022)
7. Sal Wanying Fu, PhD Student (University of California, Berkeley)
Project: Metallicity Distribution Function of the Eridanus II Ultra-Faint Dwarf Galaxy from Hubble Space Telescope Narrow-band Imaging, (ApJ, 2022)
8. Amanda Quirk, PhD (University of California, Santa Cruz), now at Columbia University
Project: Asymmetric drift of Andromeda analogues in the IllustrisTNG simulation (ApJ, 2020)
9. Nicolas Garavito-Camargo, PhD (University of Arizona), now at the Center for Computational Astrophysics

- o **A Guide to Applying for Postdocs Workshop**

Presenter | 2022-2023

- Designed and presented a 1.5 hours workshop on the process of applying to postdoctoral fellowships in Astronomy, followed by a Q&A session
- 2022: University of Arizona Steward Observatory; 2023: Astronomy Mentorship Program for Upcoming Postdocs

- o **Astronomy Mentorship Program for Upcoming Postdocs (AMP-UP)**

Mentor | 2023-Present

- Provide one-on-one mentoring to a senior graduate student in Astronomy by helping them identify career goals, provide guidance on how to achieve them, and overall professional development tips

- **Physical science Opportunities for Womxn in Education and Research (POWER) Bay Area**
Mentor | 2020–2021
 - Provide in-depth mentoring in academic and life skills to a Bay Area community college student majoring in STEM
 - **University of Arizona Graduate College Application Support Program**
Editor | Summer 2017
 - Worked with graduate students in individual and group settings to revise application materials for pre-doctoral, graduate, and dissertation fellowship grant applications
 - **University of Arizona Department of Astronomy and Steward Observatory**
Tucson Initiative for Minority Engagement in Science and TEchnology Program (TIMESTEP)
Mentor | 2015–2019
 - Mentored undergraduate STEM majors in a group setting on topics centered around professional development
- Tucson Women in Astronomy Mentoring Program
Mentor | 2014–2016
- Mentored undergraduate women majoring in physics and/or astronomy one-on-one and provided general guidance in navigating academic life
- Graduate Student-Postdoc Mentoring Program
Mentor | 2017
- Provided in-depth mentoring to first and second year women in the astronomy graduate program on best research practices, teaching skills, and managing coursework responsibilities

Academic Service.....

- Journal Referee: *The Astrophysical Journal*, *Monthly Notices of the Royal Astronomical Society*, *Astronomy & Astrophysics*
- Scientific Organizing Committee, Yellowstone XMC Workshop 2024
- Member, Poverty in Astronomy Working Group
- Volunteer, Black in Physics Week 2022, Community Engagement Team
- Member, Roman-Rubin Synergy Working Group
- Former Member, Hot Universe Baryon Surveyor Milky Way and Local Group Science Working Group
- Panelist, Roman Research and Support Participation Opportunities
- Panelist, APS Conference for Undergraduate Women in Physics 2023, Texas Christian University
- Panelist, Space Telescope Science Institute Hubble Space Telescope Time Allocation Committee
- Panelist, NASA Astrophysics Data Analysis Grants Program
- Reviewer, Swiss National Science Foundation
- Reviewer, NASA FINESST Graduate Fellowship Program
- Executive Secretary, NASA Astrophysics Theory Grants Program

Teaching Experience

- 2017-2018 | University of Arizona
 - ASTR400B: Galactic & Extragalactic Astronomy and Cosmology (Teaching Assistant)
 - Astronomy Tutoring for Majors & Minors Program (Tutor)
- 2015-2017 | Ph.G. Tutoring, Tucson, AZ
 - Tutor for elementary through high school students in mathematics

- 2013-2014 | New York University
 - Einstein's Universe (Laboratory Teaching Assistant)
 - Physics II: Intro to Electromagnetism (Teaching Assistant)
 - General Physics I (Adjunct)

Technical Skills

- Programming: Python (primary), C, C++, GitHub
- Software: Microsoft Office Suite, Google Suite, LaTeX, Zoom, Box, Dropbox, Slack
- Systems: Linux, Macintosh OS-X, Windows

Revised on September 11, 2024