GAGANDEEP S. ANAND

Senior Staff Scientist ⋄ ganand@stsci.edu ⋄ gsanand.github.io

RECENT EMPLOYMENT

Senior Staff Scientist Apr. 2024 – Present
Staff Scientist II Aug. 2021 – Apr. 2024

Employed at the Space Telescope Science Institute (Baltimore, MD) as a Senior Staff Scientist working as a member of the Advanced Camera for Surveys team on the Hubble Space Telescope.

EDUCATION

Institute for Astronomy, University of Hawaii *December 2018/August 2021*
M.S./PhD in Astronomy
Thesis: Tip of the Red Giant Branch Distances to Nearby Galaxies
Advisor: R. Brent Tully

Boston University *May 2017*
M.A. in Astronomy

Vassar College *May 2015*
A.B. in Astronomy & Physics, Minor in Mathematics

PREVIOUS RESEARCH POSITIONS

Graduate Research Assistant, University of Hawaii	Aug. 2017 – Aug. 2021
Visiting Graduate Research Fellow, IPAC/Caltech	Feb. 2020 – July 2020
Visiting Scholar, W.M. Keck Observatory	July 2017 – Aug. 2017
Graduate Researcher, Boston University	July 2015 – May 2017
Summer Researcher, Colby College	May 2014 – Aug. 2014
Observatory Assistant, Vassar College	Sept. 2011 – May 2015

COMPUTATIONAL SKILLS

Operating Systems	MacOS/OS X, UNIX/Linux, Windows
Computer Languages	Python, LaTeX, IDL
Astronomical Software	DOLPHOT, DrizzlePac, DS9, CIAO, GALFIT, IRAF, XSPEC
Amazon Web Services	API Gateway, Amplify, EC2, IAM, Lambda, S3
Miscellaneous Software/Tools	Git, Lightroom

PUBLICATION SUMMARY

NASA/ADS Link to All Publications
50 Refereed Publications (9 as first author)
4 Papers Under Review (1 as first author)
4 Instrument Science Reports (3 as first author)
3100+ Citations (400+ as first author), h-index = 21

HONORS/AWARDS

George and Mona Elmore Award for Research in Astronomy	ARCS Foundation, 2020
IPAC/Caltech Visiting Graduate Fellowship	IPAC/Caltech, 2020
W. M. Keck Observatory Visiting Scholarhip	Keck Observatory, 2017
Departmental Honors in Astronomy	Vassar College, 2015

GRANT MONEY

JWST Cycle 2, GO-3055– $243,826 to G. S. Anand (as STScI Grant PI)	JWST, 2023
JWST Cycle 2, GO-2875– $50,000 for G. S. Anand	JWST, 2023
JWST Cycle 1, GO-1685– $75,000 for G. S. Anand	JWST, 2023

OBSERVING TIME

HST Cycle 32, GO-17809 (Co-I), *48 orbits, PI D. Thilker*	HST, 2024
HST Cycle 32, GO-17743 (Co-I), *28 orbits, PI A. Riess*	HST, 2024
HST Cycle 32, GO-17712 (Co-I), *8 orbits, PI A. Benitez-Llambay*	HST, 2024
JWST Cycle 3, GO-5989 (Co-I), *29.7 hours, PI J. Jensen*	JWST, 2024
JWST Cycle 2, GO-3707 (Co-I), *148.8 hours, PI A. Leroy*	JWST, 2023
JWST Cycle 2, GO-3055 (Co-I), *46.8 hours, PI R. Tully*	JWST, 2023
HST Cycle 31, GO-17502 (Co-I), *169 orbits, PI D. Thilker*	HST, 2023
HST Cycle 31, GO-17520 (Co-I), *33 orbits, PIs L. Breuval & A. Riess*	HST, 2023

SELECT RECENT MEDIA COVERAGE

JWST Further Deepens the Biggest Controversy in Cosmology	Quanta Magazine, 2024
JWST Affirms Universe's Expansion Rate, Puzzle Persists	NASA/JWST, 2024
JWST Deepens Mystery of Hubble Constant Tension	NASA/JWST, 2023
JWST Reveals Networks of Gas and Dust in Nearby Galaxies	NASA/Hubble, 2023
Peekaboo! Tiny, Hidden Galaxy Provides a Peek Into the Past	NASA/Hubble, 2022
Investigating A Made-to-Measure Galaxy	ESA/Hubble, 2022
Astronomers Map Distances to 56,000 Galaxies	University of Hawaii, 2022

OUTREACH ACTIVITIES

ESA/Hubble Picture of the Week Series	2019–Present
Institute for Astronomy, Misc. Outreach Activities	2017–2021
Boston University Astronomy Open Nights	2015–2017
Vassar College Astronomy Open Nights	2011–2015

PROFESSIONAL MEMBERSHIPS

American Astronomical Society, Full Member	2021–Present
American Astronomical Society, Junior Member	September 2016–2021

PROFESSIONAL SERVICE

Referee — Astrophysical Journal (5+ papers), July 2018–Present

TEACHING EXPERIENCE

Department of Astronomy — Sept. 2015 –May 2017
Teaching Fellow — *Boston University*

- Astronomy 203- Principles of Astronomy II (Spring 2017)
- Astronomy 109- Cosmology (Fall 2015/Fall 2016)
- Astronomy 105- Alien Worlds (Spring 2016)

Department of Physics & Astronomy — Sept. 2014 –May 2015
Astronomy Academic Intern — *Vassar College*

- Astronomy 105- Stars, Galaxies, & Cosmology (Spring 2015)
- Astronomy 101- Solar System Astronomy (Fall 2014)

INSTRUMENT SCIENCE REPORTS

The ACS/WFC Focus-Diverse ePSF Webtool
Anand, G. S., Grogin, N., Anderson, J., Cohen, Y., & Bellini, A., Instrument Science Report, ACS, 2023-06

Systematic Effects in ACS/WFC Absolute Gain Measurements
Anand, G. S., Grogin, N., Anderson, J., & Ryon J., Instrument Science Report, ACS, 2023-02

Improved Absolute Astrometry for ACS and WFC3 Data Products
Mack, J., Hack, W., Burger, M., White, R. L., Bajaj, V., Avila, R. J., *Anand, G. S.*, de la Pena, M., Instrument Science Report, ACS, 2022-03

Revisiting ACS/WFC Sky Backgrounds
Anand, G. S., Grogin, N., & Anderson, J., Instrument Science Report, ACS, 2022-01

FIRST AUTHOR PUBLICATIONS

The TRGB−SBF Project. II. Resolving the Virgo Cluster with JWST
Anand, G. S., Tully, R. B., Cohen, Y., et al., *Submitted to ApJ*

The TRGB−SBF Project. I. A Tip of the Red Giant Branch Distance to the Fornax Cluster with JWST
Anand, G. S., Tully, R. B., Cohen, Y., et al., 2024, *ApJ*

Tip of the Red Giant Branch Distances with JWST: An Absolute Calibration in NGC 4258 and First Applications to Type Ia Supernova Hosts
Anand, G. S., Riess, A. G., Yuan, W., et al., 2024, *ApJ*

Comparing Tip of the Red Giant Branch Distance Scales: An Independent Reduction of the Carnegie-Chicago Hubble Program and the Value of the Hubble Constant
Anand, G. S., Tully, R. B., Rizzi, L., Riess, A. G., & Yuan, W., 2022, *ApJ*

The Extragalactic Distance Database: The Color-Magnitude Diagrams and Tip of the Red Giant Branch Distances Catalog
Anand, G. S., Rizzi, L., Tully, R. B., et al., 2021, *AJ*

Distances to PHANGS Galaxies: New Tip of the Red Giant Branch Measurements and Adopted Distances
Anand, G. S., Lee, J., Van Dyk, S., et al., 2021, *MNRAS*

Peculiar Velocities of Galaxies Just Beyond the Local Group
Anand, G. S., Tully, R. B., Rizzi, L., Shaya, E., & Karachentsev, I. D., 2019, *ApJ*

The Distance and Motion of the Maffei Group
Anand, G. S., Tully, R. B., Rizzi, L., & Karachentsev, I. D., 2019, *ApJL*

A Robust Tip of the Red Giant Branch Distance to the Fireworks Galaxy (NGC 6946)
Anand, G. S., Rizzi, L., & Tully, R. B., 2018, *AJ*

The Distance to the Galaxy Coma P
Anand, G. S., Tully, R. B., Karachentsev, I. D., Makarov, D. I., Makarova, L.; Rizzi, L.; Shaya, E. J., 2018, *ApJL*

PUBLICATIONS AS PRIMARY MENTOR

Tip of the Red Giant Branch Distances with JWST. II. I-band Measurements in a Sample of Hosts of 9 SN Ia Match HST Cepheids
Li, S., *Anand, G. S.*, Riess, A. G., [7 authors], *In Press at ApJ*

CO-AUTHOR PUBLICATIONS

Polycyclic Aromatic Hydrocarbon and CO(2-1) Emission at 50-150 pc Scales in 66 Nearby Galaxies
Chown, R., Leroy, A., Sandstrom, K., [8 authors], *Anand, G. S.*, [30 authors], Submitted to ApJ

The Hubble Tension in our own Backyard: DESI and the Nearness of the Coma Cluster
Scolnic, D., Riess, A. G., Murakami, Y. S., [7 authors], *Anand, G. S.*, *Submitted to ApJ*

JWST Validates HST Distance Measurements: Selection of Supernova Subsample Explains Differences in JWST Estimates of Local H_0
Riess, A. G., Scolnic, D., *Anand, G. S.*, [16 authors], *Submitted to ApJ*

Small Magellanic Cloud Cepheids Observed with the Hubble Space Telescope Provide a New Anchor for the SH0ES Distance Ladder
Breuval, L., Riess, A. G., Casertano, S., [5 authors], *Anand, G. S.*, [1 authors], *ApJ*

PHANGS-JWST: Data Processing Pipeline and First Full Public Data Release
Williams, T. G., Lee, J. C., Larson, K. L., [10 authors], *Anand, G. S.*, [42 authors], 2024, *ApJS*

Reconnaissance of the J-region Asymptotic Giant Branch in Five Nearby Galaxies using JWST
Li, S., Riess, A. G., Casertano, S., *Anand, G. S.*., Scolnic, D., Breuval, L., Huang, C. D., 2024, *ApJ*

JWST Observations Reject Unrecognized Crowding of Cepheid Photometry as an Explanation for the Hubble Tension at 8σ Confidence
Riess, A. G., *Anand, G. S.*., Yuan, W., Casertano, S., Dolphin, A., Macri, L., Breuval, L., Scolnic, D., Perrin, M., & Anderson, R., 2024, *ApJL*

Crowded No More: The Accuracy of the Hubble Constant Tested with High Resolution Observations of Cepheids by JWST
Riess, A. G., *Anand, G. S.*., Yuan, W., Casertano, S., Dolphin, A., Macri, L., Breuval, L., Scolnic, D., Perrin, M., & Anderson, R., 2023, *ApJL*

Standardized Luminosity of the Tip of the Red Giant Branch Utilizing Multiple Fields in NGC 4258 and the CATs Algorithm
Li, S., Riess, A. G., Scolnic, D., *Anand, G. S.*., Wu, J., Casertano, S., Yuan, W., Beaton, R., & Anderson, R. I., 2023, *ApJ*

CATS: The Hubble Constant from Standardized TRGB and Type Ia Supernovae
Scolnic, D., Riess, A. G., Wu, J., Li, S., *Anand, G. S.*, Beaton, R., Casertano, S., Anderson, R., Dhawan, S., Ke, X., 2023, *ApJ*

Comparative Analysis of TRGBs (CATs) from Unsupervised, Multi-Halo-Field Measurements: Contrast is Key
Wu, J., Scolnic, D., Riess, A. G., *Anand, G. S.*, Beaton, R., Casertano, S., Ke, X., & Li, S., 2023, *ApJ*

A Possible Dwarf Galaxy Satellite-of-Satellite Problem in ΛCDM
Müller, O., Heesters, N., Jerjen, H., *Anand, G. S.*, & Revaz, Y., 2023, *A&A*

Serendipitous Nebular-phase JWST Imaging of SN Ia 2021aefx: Testing the Confinement of 56-Co Decay Energy
Mayker Chen, N., Tucker, M., Hoyer, N., [5 authors], *Anand, G. S.*, [19 authors], 2023, *ApJL*

A Nearby Isolated Dwarf: Star Formation and Structure of ESO 006-001
Makarova, L. N., Tully, R. B., *Anand, G. S.*, Lambert, T. S., Sharina, M. E., Koribalski, B. S., & Kraan-Korteweg, R. C., 2023, *ApJ*

The PHANGS-JWST Treasury Survey: Star Formation, Feedback, and Dust Physics at High Angular resolution in Nearby GalaxieS
Lee, J C., Sandstrom, K. M., Leroy, A. K., Thilker, D. A., Schinnerer, E., [6 authors], *Anand, G. S.*, [65 authors], 2023, *ApJL*

PHANGS-JWST First Results: The Dust Filament Network of NGC 628 and its Relation to Star Formation Activity
Thilker, D. A., Lee, J. C., Deger, S., [24 authors], *Anand, G. S.*, [11 authors], 2023, *ApJL*

PHANGS-JWST First Results: Stellar Feedback-Driven Excitation and Dissociation of Molecular Gas in the Starburst Ring of NGC 1365?
Liu, D., Schinnerer, E., Cao, Y., Leroy, A., [24 authors], *Anand, G. S.*, [12 authors], 2023, *ApJL*

PHANGS-JWST First Results: A statistical view on bubble evolution in NGC628
Watkins, E. J., Barnes, A., [11 authors], *Anand, G. S.*, [38 authors], 2022, *ApJL*

PHANGS-JWST First Results: Dust Embedded Star Clusters in NGC 7496 Selected via 3.3 μm PAH Emission
Rodriguez, J., Lee, J., Whitmore, B., Thilker, D., [11 authors], *Anand, G. S.*, [25 authors], 2023, *ApJL*

Peekaboo: The Extremely Metal Poor Dwarf Galaxy HIPASS J1131-31
Karachentsev, I. D., Makarova, L. N., Koribalski, B. S., *Anand, G. S.*, Tully, R. B., & Kniazev, A. Y., 2023, *MNRAS*

The Whisper of a Whimper of a Bang: 2400 Days of the Type Ia SN 2011fe Reveals the Decay of 55Fe
Tucker, M. A., Shappee, B. J. , Kochanek, C.S., Stanek, K.Z., Ashall, C., *Anand, G. S.*, & Garnavich, P., 2022, *MNRAS*

Cosmicflows-4
Tully, R. B, Kourkchi, E. ; Courtois, H. M. ; *Anand, G. S.*, [13 authors], 2022, *ApJ*

PHANGS: Constraining Star Formation Timescales Using the Spatial Correlations of Star Clusters and Giant Molecular Clouds
Turner, Jordan A., Dale, Daniel A., Lilly, James, [4 authors], *Anand, G. S.*, [17 authors], 2022, *MNRAS*

A Comprehensive Measurement of the Local Value of the Hubble Constant with 1 km/s/Mpc Uncertainty from the Hubble Space Telescope and the SH0ES Team
Riess, A. G., Yuan, W., Macri, L. M., [5 authors], *Anand, G. S.*, [9 authors] 2022, ApJL

Around the Spindle Galaxy: The Dark Halo Mass of NGC 3115
Karachentsev, I. D., Makarova, L. N., *Anand, G. S.*, & Tully, R. B., 2022, *AJ*

PNLF Distances for 19 Galaxies Observed by PHANGS-MUSE
Scheuermann, F., Kreckel, K. *Anand, G. S.*, [3 authors], Van Dyk, S. D., [11 authors] , 2022, *A&A*

The PHANGS-MUSE survey. Probing the chemo-dynamical evolution of disc galaxies
Emsellem, E., Schinnerer, E., Santoro, F., [18 authors], *Anand, G. S.*, [26 authors], 2022, *A&A*

KK 242, A Faint Companion to the Isolated Scd Galaxy NGC 6503
Karachentsev, I. D., Cannon, J. M., Fuson, J., Inoue, J. L., Tully, R. B., *Anand, G. S.*, & Kaisin, S. S., 2022, *AJ*

Late-Onset Circumstellar Medium Interactions are Rare: An Unbiased GALEX View of Type Ia Supernovae
Dubay, L., Tucker, M., Do, A., Shappee, B., *Anand, G. S.*, 2022, *ApJ*

The PHANGS-HST Survey: Physics at High Angular resolution in Nearby GalaxieS with the Hubble Space Telescope
Lee, Janice C., Whitmore, Bradley C., Thilker, David A., Deger, Sinan, Larson, Kirsten L., Ubeda, Leonardo, *Anand, G. S.*, [10 authors], White, R. L., [36 authors], 2022, *ApJS*

Measuring an off-Center Detonation through Infrared Line Profiles: The peculiar Type Ia Supernova SN 2020qxp/ASASSN-20jq
Hoeflich, P., Ashall, C., Bose, S., [4 authors], *Anand, G. S.*, [12 authors], 2021, *ApJ*

PHANGS–ALMA: Arcsecond CO(2–1) Imaging of Nearby Star-Forming Galaxies
Leroy, A., Schinnerer, E., Hughes, A., [16 authors], *Anand, G. S.*, [52 authors], 2021, *ApJS*

SN2019yvq Does Not Conform to SN Ia Explosion Models
Tucker, M. A., Ashall, C., Shappee, B. J., Vallely, P. J., Kochanek, C. S., Huber, M. E., *Anand, G. S.*, Keane, J. V., Hsiao, E. Y., Holoien, T. W. S., 2021, *ApJ*

PHANGS-ALMA Data Processing and Pipeline
Leroy, A., Hughes, A., Liu, D., [16 authors], *Anand, G. S.*, [47 authors], 2021, *ApJS*

The Cepheid Distance to the Narrow-Line Seyfert 1 Galaxy NGC 4051
Yuan, W., Macri, L., Peterson, B. M., Riess, A. G., Fausnaugh, M. M., Hoffman, S. L., *Anand, G. S.*, [11 authors], 2021, *ApJ*

The Distance and Mass of the NGC 253 Galaxy Group
Karachentsev, I. D., Tully, R. B., *Anand, G. S.*, Rizzi, L., Shaya, E. J., 2021, *AJ*

The Electron-capture Origin of Supernova 2018zd
Hiramatsu, D., Howell, D. A., Van Dyk, S. D., [19 authors], *Anand, G. S.*, [7 authors], 2021, *Nature Astronomy*

The Properties of Dwarf Spheroidal Galaxies in the Cen A Group: Stellar Populations, Internal Dynamics, and a Heart-Shaped Hα Ring?
Müeller, O., Fahrion, K., Rejkuba, M., Hilker, M., Lelli, F., Lutz, K., Pawlowski, M. S., Coccato, L., *Anand, G. S.*, & Jerjen, H., 2020, *A&A*

Distance and Mass of the M104 (Sombrero) Group
Karachentsev, I. D., Makarova, L. N., Tully, R. B.; *Anand, G. S.*; Rizzi, L., Shaya, E. J., 2020, *A&A*

KKH 22, The First Dwarf Spheroidal Satellite of IC 342
Karachentsev, I. D., Makarova, L. N., Tully, R. B.; *Anand, G. S.*; Rizzi, L., Shaya, E. J., Afanasiev, V. L., 2020, *A&A*

Cosmicflows-4: The Calibration of Optical and Infrared Tully-Fisher Relations
Kourkchi, E.; Tully, R. B., *Anand, G. S.*, Courtois, H. M., Dupuy, A., Neill, J. D., Rizzi, L., Seibert, M., 2020, *ApJ*

Does Gravity Fall Down? Evidence for Gravitational-wave Deflection along the Line of Sight to GW170817
Rubin, D., Szapudi, I., Shappee, B. J., *Anand, G. S.*, 2020, *ApJL*

The High-Redshift Clusters Occupied by Bent Radio AGN (COBRA) Survey
Paterno-Mahler, R., Blanton, E. L., Ashby, M. L. N., Brodwin, M., Wing, J. D., Decker, B., Golden-Marx, E., & *Anand, G. S.*, 2017, *ApJ*

INVITED TALKS

Insights on the Hubble Tension with JWST
CERN/European Consortium for Astroparticle Theory– September 2024
LSST Dark Energy Science Collaboration– September 2024

A JWST TRGB Calibration of Surface Brightness Fluctuations
International Space Science Institute– December 2023

Cosmicflows-4: Tip of the Red Giant Branch Distances
American Museum of Natural History, New York– September 2021
Herzberg Astronomy and Astrophysics Research Centre, NRC Canada– April 2021
UMass Amherst Galaxy Lunch Talk, Amherst, MA– March 2021

PHANGS-HST: New Tip of the Red Giant Branch Distances
IPAC Colloquium, Pasadena, CA– July 2020

CONTRIBUTED TALKS

Tip of the Red Giant Branch Distances to Nearby Galaxies
Caltech Tea Talk– June 2020
Visiting Scholars Talk, W.M. Keck Observatory– August 2017

Peculiar Velocities of Galaxies Just Beyond the Local Group
Constrained Local Universe Simulations 2019 Meeting, University of Lyon– September 2019

Exploring the Structural Evolution of Massive Quiescent Galaxies
Keck Northeast Astronomy Consortium– November 2014
Colby Undergraduate Summer Research Retreat– July 2014

Observations and Analysis of Orbital Period Changes in Contact Binaries
Keck Northeast Astronomy Consortium– October 2013

CONFERENCE POSTERS

PHANGS-HST: New Tip of the Red Giant Branch Distances
236th Meeting of the American Astronomical Society– June 2020

The Extragalactic Distance Database: Color-Magnitude Diagrams and Tip of the Red Giant Branch Distances
235th Meeting of the American Astronomical Society– January 2020

Tip of the Red Giant Branch Distances to Nearby Galaxies
Stars: Birth and Death, GMT Community Science Meeting– September 2018
The 21st Century HR Diagram, Space Telescope Science Institute– April 2018

Chandra Observation of the WAT Radio Source/ICM Interaction in Abell 623
229th Meeting of the American Astronomical Society– January 2017
Chandra Science for the Next Decade, Harvard-Smithsonian Center for Astrophysics– August 2016

Observations and Analysis of Orbital Period Changes in Contact Binaries
Vassar Undergraduate Research Summer Institute– July 2013