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Work Experience

2021-present	**Post-doctoral Researcher**, University of Minnesota, Twin Cities
2015-17, 2019-21	**Graduate Teaching Assistant,** University of Missouri-Kansas City
2017-19	**Graduate Research Assistant**, University of Missouri-Kansas City

Education

2021	Ph.D., Physics and Astronomy, University of Missouri-Kansas City
2021	M.S., Physics and Astronomy, University of Missouri-Kansas City
2013	Bachelors of Technology, Electronics and Communications Engineering (ECE), Koneru Lakshmaiah University, India

Skills and Technical Experience

Python & R	Supervised & Unsupervised Learning	Bayesian Models	Statistical Analysis
PyTorch	Image & Textual Generative modeling	Unix/Linux	Data visualization
Tensorflow	Deep Learning and Computer Vision	LaTeX	Soft. pipeline dev
Git	Classification, Segmentation modeling & Transfer Learning	Image processing	HPC
scipy/scikit-learn	Pathology and medical concepts	Biomedical research	Scientific writing

Publications (lead author)

- *Through the Citizen Scientists' Eyes: Insights into Using Citizen Science with Machine Learning for Effective Identification of Unknown-Unknowns in Big Data*; **Mantha, K.B., 2024**, Citizen Science Theory & Practice, DOI: https://doi.org/10.5334/ cstp.740

- *An Opinion on H1-Antihistamines as a Potential Avenue for Endometriosis Management*, **Mantha, K.B., 2023**, American Journal of Obstetrics and Gynecology (AJOG) Global Reports, Volume 3, Issue 4, 2023, 100274, ISSN 2666-5778. https://doi.org/10.1016/j.xagr.2023.100274.

- *A case report of chronic hepatitis-C genotype 4c infection: Non-specific symptoms can become contextually relevant in clinical diagnosis*, **Mantha, K.B., 2023**, Indian Journal of Case Reports, 9(9), 261-263. https://mansapublishers.com/index.php/ijcr/article/view/4148

- *Automated 3D Tumor Segmentation using Temporal Cubic PatchGAN (TCuP-GAN)*, **Mantha, K.B.,** et al ., 2023, Submitted to the proceedings of the 2023 Brain Tumor Segmentation (BraTS) Challenge, ArXiv identifier: 2311.14148.

- *TCuPGAN: A novel framework developed for optimizing human-machine interactions in citizen science*; Sankar, R., (co-first author **Mantha, K. B.,**) et al., 2023, Proceedings of the ECML-PKDD (in press), ArXiv identifier: 2311.14177.

- *From Fat Deposits to Floating Forests: Cross-Domain Transfer Learning using PatchGAN-based Segmentation Model*, **Mantha, K.B.,** Sankar, R., Fortson, L.F., et al., **2022**, Accepted for publication in ACM CIKM 2022, ArXiv link.

- *Studying the physical properties of tidal features - I. Extracting morphological substructure in CANDELS observations and VELA simulations*, **Mantha, K.B.,** McIntosh, D.H., Ciaschi, C.P., et al., **2019**, MNRAS 486, 2643. ADS link

- *Major Merging History in CANDELS. I. Evolution of the Incidence of Massive Galaxy-Galaxy Pairs from $z = 3$ to $z \sim 0$*, **Mantha, K.B.,** McIntosh, D.H., Brennan, R., et al., **2018**, MNRAS 475, 1549. ADS link

Publications (co-author)

- *UVCANDELS: Catalogs of photometric redshifts and galaxy physical properties*; Mehta, V., et al., 2024, The Astrophysical Journal Supplement Series, 275(1), 17.

- *Jovian Vortex Hunter: A Citizen Science Project to Study Jupiter's Vortices*; Sankar, R., et al., 2024, The Planetary Science Journal, 5(9), 203.

- *The Ultraviolet Luminosity Function at 0.6¡ z¡ 1 from UVCANDELS*; Sun, L., et al., 2024, The Astrophysical Journal, 972(1), 8.

- *Galaxy Zoo DESI: large-scale bars as a secular mechanism for triggering AGNs*; Garland, I., et al., 2024, MNRAS 532, 2 (2320–2330).

- *Challenging the LyC-Ly α relation: strong Ly α emitters without LyC leakage at $z \sim 2.3$*; Citro, A., et al., 2024, arXiv preprint arXiv:2406.07618.

- *Ultraviolet and Blue Optical Imaging of UVCANDELS*; Wang, X., et al., 2024, Research Notes of the AAS, 8(1), 26.

- *Transfer learning for galaxy feature detection: Finding giant star-forming clumps in low-redshift galaxies using Faster Region-based Convolutional Neural Network*; Popp, J., et al., 2024, RAS Techniques and Instruments, 3(1), 174-197.

- *Galaxy Zoo DESI: Detailed Morphology Measurements for 8.7M Galaxies in the DESI Legacy*

Imaging Surveys; Walmsley, M., et al., 2023, MNRAS (in press), Link.

• *The Lyman Continuum Escape Fraction of Star-forming Galaxies at* $2.4 < z < 3.7$ *from UVCANDELS*; Wang, X., et al., 2023, arXiv e-prints, arXiv:2308.09064.

• *A Spatially Resolved Analysis of Star Formation Burstiness by Comparing UV and Hα in Galaxies at* $z \sim 1$ *with UVCANDELS*; Mehta, V., et al., 2023, ApJ, 952, 133.

• *Investigating the Dominant Environmental Quenching Process in UVCANDELS/COSMOS Groups*; Kuschel, M., 2023, ApJ, 947, 17.

• *Galaxy Zoo: kinematics of strongly and weakly barred galaxies*, Tobias, Géron., et al., 2023, MNRAS, 521, 1775–1793.

• *Harnessing the Hubble Space Telescope Archives: A Catalogue of 21,926 Interacting Galaxies*, OŔyan, David., et al., 2023, ArXiv link (ApJ submitted).

• *The Art of Measuring Physical Parameters in Galaxies: A Critical Assessment of Spectral Energy Distribution Fitting Techniques*, Pacifici, Camilla., et al., 2023, ApJ, 944(2), 141.

• *Dusty starbursts masquerading as ultra-high redshift galaxies in JWST CEERS observations*, Zavala, Jorge., et al., 2023, ApJL, 943(2), L9.

• *Optimized Photometric Redshifts for the Cosmic Assembly Near-infrared Deep Extragalactic Legacy Survey (CANDELS)*, Kodra, Dritan., et al., 2023, ApJ, 942(1), 36.

• *Identifying Galaxy Mergers in Simulated CEERS NIRCam Images using Random Forests*, Rose, Caitlin., et al., 2022, ApJ, 942 (1), 54.

• *Galaxy Zoo: Clump Scout–Design and first application of a two-dimensional aggregation tool for citizen science*, Dickinson, Hugh., et al., 2022, MNRAS, 517 (4), 5882-5911.

• *A Long Time Ago in a Galaxy Far, Far Away: A Candidate z 12 Galaxy in Early JWST CEERS Imaging*, Finkelstein, Steven., et al., 2022, ApJL, 940(2), L55.

• *Practical galaxy morphology tools from deep supervised representation learning*, Walmsley, Mike., et al., 2022, MNRAS, 513, 1581.

• *On the Nature of AGN and Star Formation Enhancement in the* $z = 3.1$ *SSA22 Protocluster: The HST WFC3 IR View*, Monson, Erik., et al., 2021, ApJ, 919, 51.

• *CANDELS Meets GSWLC: Evolution of the Relationship between Morphology and Star Formation Since* $z = 2$, Osborne, Chandler., et al., 2020, ApJ, 902, 770.

• *Investigating the Effect of Galaxy Interactions on AGN Enhancement at* $0.5 < z < 3.0$, Shah,

Ekta A., et al., 2020, ApJS, 904,107S.

• *Observational Constraints on the Merger History of Galaxies since $z \sim 6$: Probabilistic Galaxy Pair Counts in the CANDELS Fields,* Duncan, Kenneth., et al., 2019, ApJ 876, 110.

• *Distinguishing Mergers and Disks in High-redshift Observations of Galaxy Kinematics,* Simons, Raymond C., et al., 2019, ApJ 874, 59.

• *The AGN-Star Formation Connection: Future Prospects with JWST,* Kirkpatrick, Allison., et al., 2017, ApJ 849, 111.

• *The Nature of Massive Transition Galaxies in CANDELS, GAMA, and Cosmological Simulations,* Pandya, Viraj., et al., 2017, MNRAS 472, 2054.

Successful Grants and Proposals

• CoI – NSF Human-Computer Optimization Grant "Optimizing the Human-Machine System for Citizen Science".

• CoI – BRAIN CONNECTS: Center for Mesoscale Connectomics (2023), PI: Ugurbil, Kamil & Heilbronner, Sarah. Link

• CoI – Roman Galaxy Redshift Survey Project (2023), PI: Yun, Wang. Link

• CoI – James Webb Cycle 1 Proposal (2021), *A Pathfinder for JWST Spectroscopy: Deep High Spectral Resolution Maps of Galaxies over Redshift 1 .* PI: Kassin, Susan.

• CoI – James Webb Cycle 1 Proposal (2021), *The Webb Deep Extragalactic Exploratory Public (WDEEP) Survey: Feedback in Low-Mass Galaxies from Cosmic Dawn to Dusk.* PI: Finkelstein, Steven.

• CoI – Hubble Space Telescope Archival Program 15798 (2019), *UV Light Reveals the Life of Giant Star-Forming Clumps.* PI: Guo, Yicheng.

• CoI – Hubble Space Telescope Archival Program 15040 (2017), *Mining CANDELS for Tidal Features to Measure Major Merging at Cosmic High Noon.* PI: McIntosh, D.H.

Awards
1. James M. Phillips Scholarship in Physics (2016, 2017, 2019).
2. School of Graduate Studies Travel Grant (2016, 2017, 2018, 2019).
3. Graduate Faculty Fellowship (2017).
4. Second Prize in Poster Presentation (2017).
5. College of Arts and Science Scholarship (2017).
6. International Travel Grant (2018).

7. Ronald A. MacQuarrie Fellowship (2018)
8. School of Graduate Studies Grant Proposal (2018)
9. **Graduate Chambliss Medal.** (2018)

Active Research Collaborations
- Zooniverse.
- The Galaxy Zoo collaboration.
- Center for Mesoscale Connectomics.
- Cosmic Assembly Near-infrared Extragalactic Deep Legacy Survey (CANDELS).
- The Cosmic Evolution Early Release Science (CEERS) survey.

Selected Seminar and Conference Presentations

Invited Talks
- Chan Zuckerberg Initiative Open Science Meeting, June 2024 (Boston, MA).
- CSA Meeting, May 2023 (Tempe, AZ).
- Invited panel talk, APS April Meeting, April 2023 (*virtual*).
- Seminar, Minnesota State Universty Mankato, April 2022 (*virtual*).
- Cosmology Lunch Seminar, University of Minnesota, September 2021.
- MIT Brown Bag Lunch Talk, September 2020 (*virtual*).
- CANDELS SEDfitting Group Meeting, July 2020 (*virtual*).
- Space Telescope Science Institute, August 2019 (Baltimore, MD).
- Galaxy Interactions and mergers across cosmic time, March 2018 (Sesto, Italy).
- National Center for Radio Astrophysics, February 2018 (Pune, India).
- University of Missouri – Columbia, October 2017 (Columbia, MO).
- Kansas State University, October 2017 (Lawrence, KS).

Contributed Talks
- Zooniverse Team Meeting, August 2024 (Oxford, UK)
- Zooniverse Team Meeting, August 2023 (Chicago, IL)
- ACM CIKM 2022 Conference, October 2022 (Atlanta, GA).
- Zooniverse Team Meeting, July 2022 (Oxford, UK).
- NASA MOSGC meeting, Missouri Science and Technology, April 2019 (Rolla, MO).
- MARAC, Benedictine College, April 2019 (Atchison, KS).
- Community of Scholars Event, UMKC, March 2019 (Kansas City, MO).
- CANDELS Team Meeting, University of Massachusetts Amherst, October 2018 (Amherst, MA).
- NASA MOSGC meeting, Missouri Science and Technology, April 2018 (Rolla, MO).
- MARAC, University of Missouri Kansas City, April 2018 (Kansas City, MO).
- CANDELS SEDfitting workshop, University of California Riverside, April 2018 (Riverside, CA).
- Astronomical Society of India Seminar, February 2018 (Hyderabad, India).
- Galaxy Evolution Workshop, University of California Santa Cruz, August 2017 (Santa Cruz, CA).
- CANDELS Team Meeting, University of California Santa Cruz, August 2017 (Santa Cruz, CA).
- NASA MOSGC meeting, Missouri University of Science and Technology, April 2017 (Rolla, MO).
- MARAC, University of Kansas, April 2017 (Lawrence, KS).

- CANDELS Team Meeting, Space Telescope Science Institute, August 2016 (Baltimore, MD).
- MARAC meeting, Kansas City, April 2016 (Kansas City, MO).
- Graduate Seminar, University of Missouri Kansas City, February 2016 (Kansas City, MO).
- CANDELS Team Meeting, University of California Santa Cruz, August 2015 (Santa Cruz, CA).

Poster Presentations
- RareGems Conference, May 2024 (Tuscon, AZ).
- AAPS Annual Meeting, April 2024, *virtual*.
- 243$^{\text{st}}$ AAS meeting, January 2024 (New Orleans, LA).
- Gordon Research Conference on Volume Electron Microscopy, July 2023 (Ventura, CA).
- 241$^{\text{st}}$ AAS meeting, January 2023 (Seattle, WA).
- Nancy Grace Roman Telescope Conference, October 2020 (*virtual*).
- 236$^{\text{th}}$ AAS meeting, January 2020 (*virtual*).
- Santa Cruz Galaxy Evolution Workshop, August 2019 (Santa Cruz, CA).
- 233$^{\text{rd}}$ AAS meeting, January 2019 (Seattle, WA).
- 231$^{\text{th}}$ AAS meeting, January 2018[1] (Washington DC).
- UMKC Community of Scholars Event[2], Feb 2017 (Kansas City, MO).
- 229$^{\text{th}}$ AAS meeting, January 2017 (Grapevine, TX).
- 227$^{\text{th}}$ AAS meeting, January 2016 (Kissimmee, FL).

Professional Membership, Honors and Experience
- Junior member in the American Astronomical Society (current).
- Member of Association for Computer Machinery (2022-2023).
- Member of the American Physical Society (2022-2023).
- Student member in the Astronomical Society of India (2017-2018).
- Member of organizing committee for the Mid American Regional Astronomical (2015, 2016).
- Honor code certification: Cornell University, Relativity & Astrophysics (2014).

Teaching Experience

PHY499/5590 *Fundamentals of Astronomy Research*, <u>designed and taught</u> this combined undergraduate and graduate course, 2019-2021.

Formal Mentoring

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[1]winner of the Chambliss medal

[2]winner of the second prize

2023	**Preston Nguyen & Daanish Hindustani**, co-supervising the development and application of deep learning to distinguish gamma rays from cosmic-ray signals in data.
2023 – present	**Vijay Gill**, co-supervising the development and application of deep learning on colliding galaxies.
2023	**Nico Adams**, co-supervising the analysis of "Clumpy Galaxies".
2022	**Alina Kalizewski**, co-supervising the analysis of "Active Galaxies" using a deep learning based anomaly detection framework trained on spectroscopic data.
2022	**Grant Oie**, co-supervising the development of LSTM based deep learning models to improve the differentiation of gamma and hadronic particle shower signals.
2021	**Yuping Zheng**, co-supervising the development of GAN-based deep learning models to improve the differentiation of gamma and hadronic particle shower signals.
2021	**Arun Kumar**, co-supervised the development of a deep learning based anomaly detector on the Galaxy Zoo data.
2021	**Robert Sturm**, co-supervised a data science student led project, *Towards Efficient IACT Calibration with Deep learning-based Muon Identification*.
2018-2020	**Logan B. Fries**, co-supervised a UG-led research project, *Multi-wavelength Properties of Tidal Features Among Post-Merging Galaxies in SDSS*, now a PhD student at UConn.
2017-2018	**Rubyet Evan**, **Osiris Hines**, **Scott Thompson**, and **Derrick Jennings**, co-supervised UMKC UG summer research experience, *Residual Characteristics of Massive CANDELS Galaxies and Structural Similarity of Plausible Tidal Features*.

Certifications & Continued Education

- Fundamentals of Immunology: Innate Immunity and B-Cell Function (2024; Rice University)
- Fundamentals of Immunology: T-Cells and Signalling (2024; Rice University)
- Fundamentals of Immunology: Autoimmunity (2024; Rice University)