Curriculum Vitae

Updated: August 21, 2022

Sagnick Mukherjee

Designation: 2nd Year Graduate Student,
PhD Program in Astronomy and Astrophysics,
Department of Astronomy and Astrophysics,
University of California, Santa Cruz
Email: samukher@ucsc.edu

Academic Qualification

Examination / Degree	Board / Institute	Subjects	Year	Percentage/ Grade Points
All India Secondary School Examination (10^{th} Grade)	Central Board of Secondary Education	General Stream including English	2013	10/10
All India Senior School Certificate Examination (12th Grade)	Central Board of Secondary Education	Chemistry, Biology English, Mathematics, Physics	2013-15	94.8%
Bachelor of Science	Presidency University	Physics Major	2015-18	9.21/10 (Gold Medal)
Master of Science	Presidency University	Physics Major	2018-20	9.65/10 (Gold Medal)

Research Work

I am primarily interested in building models of exoplanets and brown dwarf atmospheres and using them with observational data to probe the physical/chemical processes ongoing in these atmospheres. I expect to use my models with James Webb Space Telescope (JWST) observations soon to probe the nature of multiple physical processes like vertical mixing and photochemistry in exoplanet and brown dwarf atmospheres.

Publications

1. "Probing the Extent of Vertical Mixing in Brown Dwarf Atmospheres with Disequilibrium Chemistry", **Sagnick Mukherjee**, Jonathan J. Fortney, Natasha E. Batalha, Theodora Karilidi, Mark S. Marley, Channon Visscher, Brittany E. Miles, Andrew J. I. Skemer (August 2022, The Astrophysical Journal (ApJ), Under Review)

2. "PICASO 3.0: A One-Dimensional Climate Model for Giant Planets and Brown Dwarfs", **Sagnick Mukherjee**, Natasha E. Batalha, Jonathan J. Fortney, Mark S Marley (August 2022, The Astrophysical Journal (ApJ), Under Review)

3. "Modeling Polarization Signals from Cloudy Brown Dwarfs Luhman 16 A and B in Three Dimensions", **Sagnick Mukherjee**, Jonathan J. Fortney, Rebecca Jensen-Clem, Xianyu Tan, Mark S. Marley, and Natasha E. Batalha (**2021**, The Astrophysical Journal, Volume 923, Number 1)

4. "Cloud Parameterizations and their Effect on Retrievals of Exoplanet Reflection Spectroscopy", **Sagnick Mukherjee**, Natasha E. Batalha, and Mark S. Marley (**2021**,The Astrophysical Journal, Volume 910, Number 2)

5. "The accretion disc-jet connection in blazars", **Sagnick Mukherjee**, Kaustav Mitra, and Ritaban Chatterjee (**2019**, Monthly Notices of the Royal Astronomical Society, Volume 486, Issue 2)

6. "X-Ray Surface Brightness Profiles of Optically Selected Active Galactic Nuclei: Comparison with X-Ray AGNs", **Sagnick Mukherjee**, Anirban Bhattacharjee, Suchetana Chatterjee, Jeffrey A. Newman, and Renbin Yan (**2019**, The Astrophysical Journal, Volume 872, Number 1)

Talks and Posters

1. Contributed Talk , 'Understanding Atmospheric Mixing with Disequilibrium Chemistry in Brown Dwarfs', July 2022, Other Worlds Laboratory (OWL) Summer Program.
2. Invited Talk , 'Understanding Exoplanet and Brown Dwarf Atmospheres in the JWST Era', June 2022, CESSI Seminar, IISER Kolkata.
3. Contributed Talk , 'Understanding Atmospheric Mixing with Disequilibrium Chemistry in Brown Dwarfs', January 2022, CHAMPs Exoplanet Early Career Seminar.
4. Contributed Talk , 'Modeling Polarization Signals from Cloudy Brown Dwarfs: Luhman 16 A and B in Three Dimensions', September 2021, Bay Area Exoplanet Meeting 38.
5. Poster Presentation, 'Modeling Polarization signals in 3D from brown dwarfs Luhman 16 and B', STScI Spring Symposium (April 2021)
6. Contributed Talk , 'Cloud Complexity Required for Retrievals on Reflected Spectroscopy of Cool Giants', September 2020, Bay Area Exoplanet Meeting 34.
7. Contributed talk, 'The accretion disc-jet connection in blazars', 37th Annual meeting of the Astronomical Society of India , Christ University, Bangalore, Spring 2019

Awards and Fellowships

1. UC Regent's fellowship for first year graduate study at Department of Astronomy and Astrophysics, UCSC.
2. Awarded the S.N. Bose Scholarship from Indo-US Science and Technology Forum (IUSSTF), 2019 for participating in short-term research at University of California, Santa Cruz.
3. Stood first in M.Sc Physics (Gold medalist) (2018-2020) and B.Sc Physics (Gold Medalist) (2015-18).
4. INSPIRE fellow, Department of Science and Technology, Government of India.
5. Jagadis Bose National Science Talent Search scholarship for undergraduate research (2015-2020).

Teaching and Mentoring Experience

1. Teaching Assistant for ASTR-16 "Astrobiology: Life in the Universe" with Prof. Natalie Batalha, Fall 2021.
2. Mentored 6 high school students for the astronomy project "Photometrically variable stars in M31" as a part of the Science Internship Program (SIP) at summer 2019 and 2020.

Scientific Computing Experience

1. Proficient scientific programming with Python and Fortran.

2. 3 years experience with exoplanet spectrum simulation package `PICASO`.

3. Contributed to development of exoplanet cloud modeling package `VIRGA`.

Observational Experience

1. Optical observations of astrometry of Pluto and photometry of star clusters using the Nickel 1-m Telescope, Lick Observatory as a part of observational astronomy course at UCSC, 2021.

2. AO assisted IR imaging of Neptune using Shane-AO with the Shane 3-m Telescope at Lick Observatory as a part of observational astronomy course, 2021.

3. Long slit spectroscopy of galaxies for measuring their rotation curve using Kast Spectrograph with the Shane 3-m Telescope at Lick Observatory as a part of observational astronomy course at UCSC, 2021.

4. Optical Spectroscopy Observation of variable stars in the Andromeda galaxy at Shane 3-m optical telescope, Lick Observatory with PI Prof. Puragra GuhaThakurta and Co-I Mr. Rafael Nunez, UCSC, Summer 2019.