Dr. Navdeep Kaur Panesar

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POSITIONS

Research Scientist — 01 August 2025 – Present
SETI Institute, Mountain View, USA.
LMSAL, Palo Alto, USA. — 04 April 2019 – Present

Research Scientist — 04 April 2019 – 31 July 2025
Bay Area Environmental Research Institute, Moffett Field, USA.

NASA Post-Doctoral Fellow — 15 April 2016 – 03 April 2019
NASA/Marshall Space Flight Center Huntsville, USA.

Visiting Research Scholar — 15 April 2018 – 15 Dec 2019
Stanford University, USA.

Post-Doctoral Fellow — 14 August 2014 – 14 April 2016
Center for Space Plasma and Aeronomic Research (CSPAR),
University of Alabama in Huntsville, USA.

Post-Doctoral Fellow — January 2014 – July 2014
Max Planck Institute for Solar System Research
(MPS), Göttingen, Germany.

EDUCATION

Ph.D. (Magna cum Laude grade), Physics — 2014
Georg-August-Universität Göttingen, Germany,
Max Planck Institute for Solar System Research (MPS)

- Ph.D. thesis was published by Göttingen University in special edition 'Universitätsverlag Göttingen' and selected for display at *Deutsche National Bibliothek*; ISBN: 978-3-86395-158-0

M.Tech, Space and Atmospheric Sciences
Physical Research Laboratory, India.

M.Sc, Astronomy and Space Physics
Punjabi University, India.

B.Sc, major in Physics, Chemistry, Mathematics
Panjab University, India.

ROLES and RESPONSIBILITIES

•A team member of SDO/Atmospheric Imaging Assembly (AIA) at LMSAL.
•Responsible and lead for AIA HEK (The Heliophysics Events Knowledgebase) annotations.
•A science team member of Multi-slit Solar Explorer (MUSE) at LMSAL.
•A team member of MUSE outreach program at LMSAL.
•A team member of 'Solar Jet Hunter' zooniverse project.
•Selected as a test user for analyzing Solar Orbiter's EUI commissioning phase data by Solar Orbiter's PI (Daniel Müller).

RESEARCH INTERESTS

Magnetic buildup and trigger of pre-jet minifilament eruptions, small-scale jets, magnetic nature of spicules and plumes.
Study of small-scale features, e.g. coronal jets, jetlets, campfires, and spicules, that contribute to powering the coronal heating and solar wind.
Solar flares and erupting prominences (related to coronal mass ejections).
Study of erupting and non-erupting prominence tornados, and their triggering mechanism.
Solar Terrestrial Relations (Space Weather prediction studies).
Thermal and magnetic structure of prominences and active regions (differential emission measure; DEM).

TEACHING and MENTORING

•Teaching assistant for Bachelor students at Göttingen University, Institut für Theoretische Physik (Winter Semester 2012-2013). 'Thermodynamics and statistical physics'.
•Teaching assistant for Master laboratory at Göttingen University, Institut für Astrophysik (Summer Semester 2013). 'Morphology of Galaxies'.
•Dr. Panesar has mentored/co-mentored 23 REU (Research Experience for Undergraduates) summer students and three high school summer students on different science projects.

REVIEW SERVICE

NASA Panelist: NASA Fellowship Activity, ROSES Heliophysics Supporting Research solicitation.
For Journals: The Astrophysical Journal (ApJ), Astrophysical Journal Letters (ApJL), Astronomy and Astrophysics Journal (A&A), Astronomy and Astrophysics Letters, Nature Communications (NCOMMS), Nature Astronomy (NATASTRON), Solar Physics.

NEWS and HIGHLIGHTS

Solar campfire work and Solar Jet Hunter work have been highlighted in the news:
•https://www.sciencenews.org/article/sun-campfire-flare-closer-understanding
•https://baeri.org/science-news-covers-baeri-heliophysicists-work-on-campfires/
•https://baeri.org/baeris-navdeep-panesar-helps-launch-citizen-science-project-to-study-the-sun/
•https://science.nasa.gov/citizen-science/solar-jet-hunter/

PROFESSIONAL SERVICES

•American Geophysical Union (AGU) membership, 2014-present.

•Solar Physics Division (SPD) membership, 2017-present and OSPA Judge.

•A member of Scientific Organizing Committee (SOC) of the SOLARNET-2 conference in Potsdam (8-12 May 2023) organized by the Leibniz Insitute for Astronomy Potsdam (AIP), Germany.

•A member of Scientific Organizing Committee (SOC) of *SDO 2025 Science Workshop: A Gathering of the Helio-hive!*.

FELLOWSHIPS and AWARD

•NASA Citizen Science award as Co-I (Sophie Musset, PI), 'What is the total energy input to the heliosphere from solar jets?' 2025 –2027.

•NASA Heliophysics Supporting Research (HSR) award as Co-I (Jeongwoo Lee, PI), 'Study of Small-scale Ejections from the Photosphere to the Corona', 2023 – 2026.

•NSF AAG award as Co-I (Sanjiv Tiwari, PI), 'Investigation of Small-scale Jets In and Near Sunspot Penumbrae: Early DKIST Science', 2023 – 2026.

•First EUI Guest Investigator award as PI, 'A Study of Solar Campfires using Solar Orbiter and SDO data and BIFROST MHD Simulations', 2023.

•NASA Heliophysics Supporting Research (HSR) award as Co-I (Sanjiv Tiwari, PI), 'Investigation of Heating of Coronal Plumes and Loops by Magnetic Flux Convergence and Cancellation', 2022 – 2025.

•NASA Heliophysics Supporting Research (HSR) award as institutional PI (Alphonse Sterling, PI), 'Observational and Numerical Studies of Active-Region Filament/Filament Channel-Field Formation, Buildup to Eruption, and Eruption Onset', 2021 – 2024.

•NASA Heliophysics Guest Investigators (HGI) award as PI, 'Investigation of whether Network Jets work like Coronal Jets', 2020 – 2023.

•NASA Heliophysics Guest Investigators (HGI) award as institutional PI (Lindsay Glesener, PI), 'Solar jet-associated energetic electrons escaping the Sun', 2020 – 2023.

•NASA Post-Doctoral Fellowship (NPP), NASA MSFC, USA, April 2016.

•Post-Doctoral Fellowship from CSPAR, UAH, USA, July 2014.

•Post-Doctoral Fellowship offered by the University of Catania, Italy, July 2014 (Declined).

•Ph.D. thesis is published by Göttingen University in special edition *Universitätsverlag Göttingen* and also selected for display at 'Deutsche National Bibliothek'; Dr. Panesar received cash prize of 1500 euros from VG-WORT.

•Post-Doctoral Fellowship, MPS, Germany, January 2014-August 2014.

•IAU travel grant awarded, 2013.

•DAAD grant awarded, 2013, Germany.

•SCOSTEP/SF2A grant awarded, 2013.

•Fellowship from Max Planck Institute, Germany.

•Stipend during M.Tech from CSSTEAP, ISRO, India.

•Scholarship in Bachelor degree from (2002-2005) Panjab University, Chandigarh, India.

SELECTED PUBLICATIONS

1. **Panesar, N. K**, Sterling, A. C., Moore, R. L., Tiwari, S. K., Berghmans, D., Zhukov, A., Mierla, M., Verbeeck, C., Stegen, K. "Buildup, Explosion, and Untwisting of a Solar Active Region Jet Observed with Solar Orbiter, IRIS, and SDO", 2025, ApJ, under review.
2. Moore, R. L., Tiwari, S. K., Aparna, V., **Panesar, N. K**., et al. "Pivot of the Emerging Bipolar Magnetic Region in the Birth of Sigmoidal Solar Active Regions", 2025, ApJ Letters, 989, 54.
3. Sterling, A. C., **Panesar, N. K**., Moore, R. L."How Small-scale Jet-like Solar Features Might Produce the Solar Wind", 2024, ApJ, 963.
4. **Panesar, N. K**., Hansteen, V. H., Tiwari, S. K., et al. "Solar Orbiter and SDO Observations, and Bifrost MHD Simulations of Small-scale Coronal Jets", 2023, ApJ, 943, 24.
5. Tiwari, S. K., Wilkerson⋆, L., **Panesar, N. K**., Moore, R. L., & Winebarger, A." Dominance of Bursty over Steady Heating of the 4–8 MK Coronal Plasma in a Solar Active Region: Quantification using Maps of Minimum, Maximum, and Average Brightness", 2023, ApJ, 942, 2. (⋆My 2021 REU student.)
6. **Panesar, N. K**., Tiwari, S. K., Moore, R. L., Sterling, A. C., & De Pontieu, B. "A Dwarf Solar Minifilament's Genesis and Small-scale Jet-making Blowout Eruption Tracked in IRIS Spectra", 2022, ApJ, 939 25.
7. Moore, R. L., **Panesar, N. K**., Sterling, A. C., & Tiwari, S. K., "Bipolar Ephemeral Active Regions, Magnetic Flux Cancellation, and Solar Magnetic Explosions", 2022, ApJ, 933, 12.
8. Tiwari, S. K., Hansteen, V. H., De Pontieu, B., **Panesar, N. K**., & Berghmans, D. "SOLO/EUI Observations of Prevalent Fine-scale Bright Dots in an Emerging Flux Region:Comparison with BIFROST MHD Simulations", 2022, ApJ, 929, 103.
9. **Panesar, N. K**., Tiwari, S. K., Berghmans, D., Cheung, M., et al. "The Magnetic Origin of Solar Campfires", 2021, ApJ Letters, 921, 20.
10. Rast, M. P.,..... **Panesar, N. K**.,et al. "Critical Science Plan for the Daniel K. Inouye Solar Telescope (DKIST)", 2021, Solar Phy, 296.
11. Harden⋆, A. R., **Panesar, N. K**., Moore, R. L., Sterling, A. C. & Adams, M. "The Cause of Faint Coronal Jets from Emerging Flux Regions in Coronal Holes", 2021, ApJ, 912, 97. (⋆My 2018 REU student.)
12. Tiwari, S. K., Evans, C. L., **Panesar, N. K**., Prasad, A & Moore, R. L., "Are the brightest coronal loops always rooted in mixed-polarity magnetic flux?", 2021, ApJ, 908, 151.
13. Moore, R. L., Tiwari, S. K., **Panesar, N. K**., & Sterling, A. C. "On Making Magnetic-flux-rope Ω Loops for Solar Bipolar Magnetic Regions of All Sizes by Convection Cells", 2020, ApJ Letters, 902, 35.
14. **Panesar, N. K**., Sterling, A. C., Moore, R. L., Winebarger, A. R., Tiwari, S. K., et al. "Hi-C 2.1 Observations of Jetlet-like Events at Edges of Solar Magnetic Network Lanes", 2019, ApJL, 887, 8.

15. McGlasson*, R. A., **Panesar, N. K**., Sterling, A. C., & Moore, R. L., "Magnetic Flux Cancellation as the Trigger Mechanism of Solar Coronal Jets", 2018, ApJ, 882, 16. (*My 2017 REU student.)
16. **Panesar, N. K**., Sterling, A. C., Moore, R. L., Tiwari, S. K., De Pontieu, B. & Norton, A. A., "IRIS and SDO Observations of Solar Jetlets Resulting from Network-Edge Flux Cancelation", 2018b, ApJL, 868, 8.
17. Sterling, A. C., Moore, R. L. & **Panesar, N. K.,** "Magnetic Flux Cancelation as the Buildup and Trigger Mechanism for CME-Producing Eruptions in two Small Active Regions", 2018, ApJ, 264, 68.
18. **Panesar, N. K**., Sterling, A. C., & Moore, R. L., "Magnetic Flux Cancellation as the Origin of Solar Quiet-Region Pre-Jet Minifilaments", 2017, ApJ, 833, 131.
19. Sterling, A. C., Moore, R. L., Falconer, D. A., **Panesar, N. K**., et al. "Solar AR Coronal Jets II: Triggering and Evolution of Violent Jets", 2017, ApJ, 844, 28.
20. **Panesar, N. K**., Sterling, A. C., Moore, R. L., & Chakrapani*, P., "Magnetic Flux Cancelation as the Trigger of Solar Quiet-region Coronal Jets", 2016b, ApJL, 832, 7. (*My 2015 High-School summer student.)
21. **Panesar, N. K**., Innes, D. E., Tiwari, S. K., & Low, B. C., "A solar tornado triggered by flares?" 2013, A&A, 549, 105.

ADSABS link of all publications
Google Scholar link of all publications
ORCID webpage link.