

Curriculum Vitae

Name - Dr. Manpreet Singh

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Educational Qualifications

| Degree | Board /University | Year |
|--|---|------|
| Ph.D. (Plasma Physics) | Guru Nanak Dev University, Amritsar, India. | 2019 |
| Bachelor of Education (B.Ed.) | Guru Nanak Dev University, Amritsar, India. | 2013 |
| M. Sc. (Applied Physics) | Guru Nanak Dev University, Amritsar, India. | 2012 |
| B. Sc. (Physics, Chemistry, Mathematics) | Guru Nanak Dev University, Amritsar, India. | 2010 |

Ph. D. Thesis

Obtained Ph.D. with thesis, titled "**Study of dispersive Alfvén waves in multi-species and dusty plasmas**" under the supervision of Prof. N. S. Saini, Department of Physics, Guru Nanak Dev University, Amritsar, India (during 2013-2018). In my Ph. D., I studied the coherent nonlinear structures associated with the dispersive Alfvén waves in different space plasma environments.

Specialization

Collisionless Shocks, Plasma Waves, Wave-Particle interactions, and Stochastic Particle Acceleration at collisionless shocks, and in Space and Astrophysical Plasmas.

Appointments

| Designation | Time Duration | Name of Institution |
|----------------------------------|----------------------------------|---|
| Post-doctoral Research Associate | March 2021 to Present | Lunar and Planetary Laboratory, University of Arizona, Tucson, AZ, USA. |
| Assistant Professor | July 2019 to February 2021 | Department of Physics, Baring Union Christian College, Batala, Punjab, India. |

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| Lecturer | September 2018 to May 2019 | Department of Physics, Guru Nanak Dev University, Amritsar, Punjab, India. |
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Present Designation

I am currently a Post-doctoral Research Associate at the Department of Planetary Sciences-Lunar and Planetary Laboratory, University of Arizona, Tucson, USA.

Professional Services

I am currently serving as a review editor in the journal: *Frontiers in Astronomy and Space Sciences*. In the past, I have also served as a reviewer for the journals: *European Physical Journal D*, *Zeitschrift für Naturforschung A*, and *Alexandria Engineering Journal*.

Short term Courses/Schools Attended

| Subject/ Topic | Held at | Year | Sponsored |
|--|---|---------------------|---|
| High intensity Laser Plasma Interaction: Theory and Simulation | Indian Institute of Technology (IIT), Delhi. | 05-23 May, 2014 | SERB, Department of Science and Technology, Govt. India |
| Plasma Theory | Institute of Advanced Study in Science and Technology (IASST), Guwahati, India. | 9-29 November, 2016 | SERB, Department of Science and Technology, Govt. India |

Memberships of Professional Bodies

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| Name of Professional Body |
| American Geophysical Union (AGU) |
| Student member (For one year) of IEEE |
| Life member of Association of Asia Pacific Physical Societies (AAPPS) - Division of Plasma Physics (DPP) |
| Life member of Plasma Science Society of India (PSSI) |

Computational Skills

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|--------|-------|-------------------------------|-----------------------------|
| Matlab | IDL | Wolfram Mathematica | Particle-in-cell Simulation |
| Python | LaTeX | MS (Word, Power-Point, Excel) | |

Mentoring Experience

- I have experience in mentoring an undergraduate student intern at the University of Arizona for NASA Space grant consortium with project title, “The Study of Plasma Waves in Space Plasmas”.
- Co-advised an undergraduate student for a research project related to the *Energetic Particles Spectrum at Interplanetary Shocks*.
- Co-advised five master’s students while working at the Guru Nanak Dev University for projects related to the plasma waves in space plasmas.

Other competitive Exams Qualified

| Examination Name | Conducting Authority | Year |
|--|--|------|
| UGC-CSIR NET in Physics (A Highly Competitive National Level Test in India) | University Grant Commission (UGC)*, New Delhi, India. <small>*higher education authority in India.</small> | 2017 |
| Punjab State Teacher Eligibility Test (PSTET)-2: State Level Test | Conducted by Govt. of State of Punjab, India | 2013 |

List of Publications

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| Number of Publications =23, h-index= 7, i10 index= 3 |
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Publications

1. **Manpreet Singh**, Federico Fraschetti, Joe Giacalone, “*Electrostatic Plasma wave excitations at the interplanetary shocks*”, The Astrophysical Journal, **943**, 16 (2023).
2. **Manpreet Singh**, Kuldeep Singh and N. S. Saini, “*Large-amplitude dust inertial Alfvén waves in an electron-depleted dusty plasma*”, *Pramana-Journal of Physics*, **95**, 197 (2021).
3. **Manpreet Singh**, Kuldeep Singh and N. S. Saini, “*Kinetic Alfvénic cnoidal waves in*

Saturnian Magnetospheric plasmas", *Waves in Random and Complex Media*, <https://doi.org/10.1080/17455030.2021.2015083>, (2021).

4. **Manpreet Singh**, N. S. Saini and Ioannis Kourakis, "*Kinetic Alfvén solitary waves in a plasma with two-temperature superthermal electron populations: the case of Saturn's magnetosphere*", *Monthly Notices of the Royal Astronomical Society*, 486, 5504, (2019).

5. **Manpreet Singh**, Nimardeep Kaur, N. S. Saini, "*Effect of polarization force on small amplitude dust kinetic Alfvén solitary and rogue waves in a nonextensive plasma*", *Physica A*, 503, 1228 (2018).

6. **Manpreet Singh**, Nimardeep Kaur, and N. S. Saini, "*Arbitrary amplitude dust kinetic Alfvén solitary waves in the presence of polarization force*", *Physics of Plasmas*, 25, 023705 (2018).

7. **Manpreet Singh**, Kuldeep Singh, Papihra Sethi, Nimardeep Kaur and N. S. Saini, "*Three dimensional ion acoustic solitary waves in a magnetized plasma consisting of two temperature nonextensive electrons*", *AIP Conference Proceedings*, 2136, 060003, 2019.

8. **Manpreet Singh**, Yashika Ghai, Papihra Sethi and N. S. Saini, "*Modulation instability of Dust Kinetic Alfvén Waves in a plasma comprising of nonextensive electrons and ions in the presence of polarization force*", *Proceedings of the 4th International Multi-Track Conference (IMTC) on sciences, engineering and technical innovations*, pp. 528-531 (2019). ISBN : 978-81-929077-8-9.

9. **Manpreet Singh**, Ripin Kohli, Nimardeep Kaur, and N. S. Saini, "*Effect of polarization force on large amplitude dust kinetic Alfvén waves*", *AIP Conference Proceedings*, 1925, 020012, (2018).

10. Nimardeep Kaur, **Manpreet Singh**, and N. S. Saini, "*Magnetosonic cnoidal waves and solitons in a magnetized dusty plasma*", *Physics of Plasmas*, 25, 043704 (2018).

11. Balwinder Singh Chahal, **Manpreet Singh**, Shalini, N. S. Saini , "*Dust ion acoustic freak waves in a plasma with two temperature electrons featuring Tsallis distribution*", *Physica A*, 491, 935 (2018) .

12. Ripin Kohli, Nimardeep Kaur, **Manpreet Singh**, and N. S. Saini, "*Effect of Ion Beam on Dust-Acoustic Waves Under Transverse Perturbations in Dusty plasmas*", *IEEE Transactions on Plasma Science*, 46(4), 782 (2018).

13. Nimardeep Kaur, **Manpreet Singh**, Ripin Kohli, and N. S. Saini, "*Effect of Ion Beam on Low-Frequency Cnoidal Waves in a Non-Maxwellian Dusty Plasma*", *IEEE Transactions on Plasma Science*, 46(4), 768 (2018).

14. Yashika Ghai, N. S. Saini, and **Manpreet Singh**, "*Effect of Nonthermal Electrons and Ions*

on Longitudinal Dust Acoustic Solitary Waves in a Strongly Coupled Dusty Plasma”, IEEE Transactions on Plasma Science, 46(4), 825 (2018).

15. N. S. Saini, Barjinder Kaur, **Manpreet Singh** and A. S. Bains, “*Dust kinetic Alfvén solitary and rogue waves in a dusty plasma with two temperature nonextensive ions*”, *Physics of Plasmas*, 24, 073701 (2017).

16. N. S. Saini, **Manpreet Singh** and A. S. Bains, “*Dust kinetic Alfvén solitary and rogue waves in a superthermal dusty plasma*”, *Physics of Plasmas*, 22, 113702 (2015).

17. Nimardeep Kaur, Papihra Sethi, **Manpreet Singh**, Kuldeep Singh and N. S. Saini, “*Nonlinear excitations in a relativistic plasma with non Maxwellian electrons*”, *AIP Conference Proceedings*, 2136, 060004, 2019.

18. Kuldeep Singh, **Manpreet Singh**, Nimardeep Kaur, Papihra Sethi and N. S. Saini, “*Ion acoustic shocks in degenerate plasma with trapping in a quantizing magnetic field*”, *AIP Conference Proceedings*, 2136, 060002, 2019.

19. Papihra Sethi, Nimardeep Kaur, Kuldeep Singh, **Manpreet Singh** and N. S. Saini, “*Positron acoustic nonlinear waves in multi-component plasmas*”, *AIP Conference Proceedings*, 2136, 060005, 2019.

20. Yashika Ghai, **Manpreet Singh**, Papihra Sethi and N. S. Saini, “*Kinetic Alfvén Solitary Waves in Partially Ionized Solar Plasma*”, *Proceedings of the 4th International Multi-Track Conference (IMTC) on sciences, engineering and technical innovations*, pp. 540-542 (2019). ISBN : 978-81-929077-8-9.

21. Papihra Sethi, Yashika Ghai, **Manpreet Singh** and N. S. Saini, “*Shock Waves in an Electron Depleted Dusty Plasma With Nonextensive Ions*”, *Proceedings of the 4th International Multi-Track Conference (IMTC) on sciences, engineering and technical innovations*, pp. 532-535 (2019). ISBN : 978-81-929077-8-9.

22. Barjinder Kaur, **Manpreet Singh**, and N. S. Saini, “*Dust ion-acoustic shock waves in magnetized pair-ion plasma with kappa distributed electrons*”, *AIP Conference Proceedings* 1925, 020018 (2018).

23. N. S. Saini, **Manpreet Singh** and I. Kourakis, “*Large Amplitude Kinetic Alfvén Excitations in non-Maxwellian Plasmas*”, *Proceedings of the 44th EPS Conference on Plasma Physics*, Vol. 41F, pp.- P1.411.

Paper Presentations at Conferences

1. *Linear Ion Acoustic fluctuations, and the nonlinear solitary waves at the interplanetary shocks*, **Manpreet Singh**, Federico Fraschetti, Joe Giacalone, presented at the

AGU Fall meeting-2022, Chicago, IL, USA.

2. *Modeling ion acoustic waves at the Interplanetary shocks*, **Manpreet Singh**, Federico Fraschetti, Joe Giacalone, presented at the AGU Fall meeting-2021, New Orleans, LA, USA.

3. *Model for the Energetic Particles Spectrum at Interplanetary Shocks resulting from Acceleration and Escape sourced by a Preexisting Population with Power Law Energy Spectrum*, Thomas M. Do, Federico Fraschetti, and **Manpreet Singh**, to be presented at the upcoming AGU Fall meeting-2021, New Orleans, LA, USA.

4. *Electron Acceleration and Heating by Kinetic Alfvén Waves in the Saturn's Magnetosphere*, **Manpreet Singh**, Yashika Ghai, and N. S. Saini, Presented at URSI Asia Pacific-Radio Science Conference-2019 (AP-RASC 2019), New Delhi, India, 9-15 March 2019.

4. *Three dimensional ion acoustic solitary waves in a magnetized plasma consisting of two temperature nonextensive electrons*, **Manpreet Singh**, Kuldeep Singh, Papihra Sethi, Nimardeep Kaur and N. S. Saini. Presented at the International Conference on Photonics, Metamaterials & Plasmonics (PMP-2019), held at Jaypee Institute of Information Technology, Noida, Uttar Pradesh, India, from 14-16 February, 2019.

5. *The Effect Of Dust Charge Fluctuations On Nonlinear Dust Kinetic Alfvén Waves*, **Manpreet Singh** and N. S. Saini. Presented at 33rd National Symposium on Plasma Science & Technology (PLASMA 2018) held at University of Delhi, from 4-7 December, 2018.

6. *Modulation instability of Dust Kinetic Alfvén Waves in a plasma comprising of nonextensive electrons and ions in the presence of polarization force*, **Manpreet Singh**, Yashika Ghai, Papihra Sethi and N. S. Saini. Presented at 4th International Multi-Track Conference (IMTC) on sciences, engineering and technical innovations, held at CT institute of Engineering, Management and Technology, from 5-6 October, 2018.

7. *Periodic kinetic Alfvén waves in a plasma with two temperature superthermal electrons*, **Manpreet Singh**, Yashika Ghai, Barjinder Kaur and N. S. Saini. Presented at 42nd COSPAR Scientific Assembly-2018, Pasadena, California, USA, from 14- 22 July, 2018.

8. *Dust inertial Alfvén waves in electron depleted dusty plasma*, Balwinder Singh Chahal, **Manpreet Singh** and N. S. Saini. Presented at The 32nd National Symposium on Plasma Science and Technology, hosted by Institute for Plasma Research, held at Gandhinagar, Gujarat, India from 7-10 Nov., 2017.

9. *Dust magnetosonic shocks in dusty plasmas*, **Manpreet Singh** and N. S. Saini. Presented at The 32nd National Symposium on Plasma Science and Technology, hosted by Institute for Plasma Research, held at Gandhinagar, Gujarat, India from 7-10 November, 2017.

10. *Dust ion acoustic shock waves in magnetized pair-ion plasma with kappa distributed*

electrons, Barjinder Kaur, **Manpreet Singh** and N. S. Saini. Presented at The 8th International Conference on the Physics of Dusty Plasmas held Prague from 20-25 May, 2017.

11. *Effect of nonthermal electrons and ions on longitudinal dust acoustic solitary waves in strongly coupled dusty plasma*, Yashika Ghai, N. S. Saini and **Manpreet Singh**. Presented at The 8th International Conference on the Physics of Dusty Plasmas held Prague from 20-25 May, 2017.

12. *Effect of Polarization force on dust kinetic Alfvén waves*, **Manpreet Singh** and N. S. Saini. Presented at The 8th International Conference on the Physics of Dusty Plasmas held Prague from 20-25 May, 2017.

13. *Shock waves with higher order effects in an electron depleted dusty plasma*, Yashika Ghai, **Manpreet Singh** and N.S. Saini. Accepted for presentation at 41st COSPAR Scientific assembly -2016, Istanbul, Turkey from 30th July-7 August , 2016.

14. *Dust Acoustic Solitary structures in a multi-fluid dusty plasma in the presence of kappa distributed particles*, **Manpreet Singh**, Nimardeep Kaur, Yashika Ghai , Papihra Sethi and N. S. Saini. Accepted for presentation at 41st COSPAR Scientific assembly -2016, Istanbul, Turkey from 30th July- 7 August , 2016.

15. *Arbitrary amplitude kinetic Alfvén solitary waves in two temperature electron superthermal plasma*, **Manpreet Singh** and N.S. Saini. Accepted for presentation at 41st COSPAR Scientific assembly -2016, Istanbul, Turkey from 30th July- 7 August , 2016.

16. *KP equation for low frequency solitary waves in a superthermal dusty plasma*, **Manpreet Singh**, Gurleen Kaur, Nimardeep Kaur , Papihra Sethi and N. S. Saini. Presented at 30th National Symposium on Plasma Science and Technology, held at SINP, Kolkata, West Bengal from 1-4 Dec. 2015.

17. *Solitary kinetic Alfvén waves in two temperature electron plasma*, **Manpreet Singh** and N. S. Saini, Presented at 30th National Symposium on Plasma Science and Technology, held at SINP, Kolkata, West Bengal from 1-4 Dec. 2015.

18. *Dust kinetic Alfvén solitary waves in a superthermal dusty plasma*, **Manpreet Singh** and N.S. Saini, Presented at 29th National Symposium on Plasma Science and Technology & International Conference on Plasma & nanotechnology, held at Mahatma Gandhi University, Kottayam, Kerala from 8-11 Dec. 2014.