Curriculum Vitae of Dr. Sukhmander Singh

Dr. Sukhmander Singh

Associate Professor

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I am working as an Associate professor in the department of physics, central university of Rajasthan, Kishangarh. Ajmer, India. Prior to joining here, I have also worked at Delhi University for almost four years. I have completed Ph.D. in theoretical plasma physics from Indian Institute of Technology, Delhi. I have published several research articles in International journals and conferences. My area of interest includes theory and simulation of plasma waves and instabilities in magnetized and dusty plasma, quantum plasma and Hall magnetohydrodynamics.

Teaching Experience (13 Years)

[1] Associate professor at Department of physics, Central University of Rajasthan, Ajmer, from January 2025 onwards.

[2] Assistant professor at Department of physics, Central University of Rajasthan, Ajmer, from Dec. 2015 to January 2025.

[3] Assistant Professor at Motilal Nehru College, University of Delhi from Feb. 2012 to Dec.2015.

Professional activities: Editorial member of IOSR Journal of Applied Physics (IOSR-JAP)

Books published/ edited

1. Rayleigh Taylor and Resistive Instabilities in Hall Thrusters (ISBN-13: 978-613-8-83477-9), Scholars press Plasma Science,

2. Selected Topics in Plasma Physics, (ISBN 978-1-83962-679-1), IntechOpen, London, United Kingdom

3. Singh, S. (Ed.). (2023). Plasma Science - Recent Advances, New Perspectives and Applications. IntechOpen. doi: 10.5772/intechopen.104018, ISBN 978-1-83768-024-5

Reviewers of Journals

1. Physics of Plasma
2. Journal of Physics D: Applied Physics
3. International Journal of Ambient Energy
4. Plasma Research Express (PREX)
5. Plasma Sources Sci. Technol. – PSST
6. Journal of Renewable and Sustainable Energy

Membership of professional bodies

1. Life member of Indian Association of Physics Teachers **(11594 - L7588)**
2. Life Member of Plasma Science Society of India **(LM-1349)**
3. Life Member of Indian Science Congress Association (**L33892)**
4. AAPPS-DPP (Division of Plasma Physics) **1240**

LIST OF PUBLICATIONS:

[1] Jai Singh Baghel,Kuldeep Singh, Dharmendra Jat, Sukhmander Singh, and Kishan Kumar, Dust acoustic supersolitary wavesin a plasma with negatively charged dust grains and nonthermal electrons. Phys. Scr. 101 (2026) 145601 ,https://doi.org/10.1088/1402-4896/ae5614

[2] Sukhmander Singh, et al., Influence of negatively charged dust and axial-radial magnetic field components on electrostatic ion transit time instability in a Hall thruster. Phys. Scr July2025

[3] R. Kumar, D. Singh, K. Gopal, A. P. Singh and S. Singh, "Submillimeter Radiation Production Using Two Unidentical Lasers in Hot Collisional Plasma," in IEEE Transactions on Plasma Science, doi: 10.1109/TPS.2025.3570463. 17 June 2025

[4] Rohit Kumar, Divya Singh, Sukhmander Singh, AP Singh, and Krishna Gopal, Resonantly driven terahertz feld emission in collisional plasmas: effect of chirped laser pulse. Journal of Optics. https://doi.org/10.1007/s12596-025-02489-x, 17 February 2025

[5] Saty Prakash Bharti, Sukhmander Singh, Effects of axial and radial components of magnetic field on the electromagnetic resistive instabilities in hall thruster plasma, 9 July, 2024 Phys. Scr. 99 085603, 9 July2024 https://iopscience.iop.org/article/10.1088/1402-4896/ad5c0f

[6] Divya Singh, Rohit Kumar, Sukhmander Singh, Krishna Gopal, A numerical study of resonant control of energy transfer in Laser Plasma Interactions", IEEE Transactions on Plasma Science, 3 June, (2024) , Doi: 10.1109/TPS.2024.3399811
[7] Divya Singh , Krishna Gopal, Rohit Kumar and Sukhmander Singh, "Far IR field Generation by mixing of Cosh-Gaussian and Dark Hollow Gaussian laser in encapsulated plasma", Physica Scripta, 20 May 2024, 99, 065609
[8] Divya Singh, Rohit Kumar, Sukhmander Singh, Krishna Gopal, "Resonantly Controlled Terahertz Field Generation in Warm Collisional Plasma", Journal of Optics, 6 May, (2024) , https://doi.org/10.1007/s12596-024-01816-y
[9] Rohit Kumar, Siddharth Bhardwaj and Sukhmander Singh, "Terahertz Generation: A bibliometric Study", Journal of Theoretical and Applied Physics 20 March, (2024) 18, 1-21

[10] Rohit Kumar, Krishna Gopal, Divya Singh and Sukhmander Singh, "Terahertz field generation by beating of mixed profile lasers in under-dense plasma", IEEE Transaction on Plasma Science, 29 February 2024, 52, 1053-61
[11] Saty Prakash Bharti, Sukhmander Singh, Effect of axial and radial components of the magnetic field on the electrostatic resistive instabilities in Hall thruster plasma, Phys. Plasmas 31, 022105, 7 February (2024)
[12] Ashish, Krishna Gopal, Devki Nandan Gupta, Sukhmander Singh and Anuj Vijay. Terahertz radiation generation from amplitude-modulated laser filament interaction with a magnetized plasma. Modern Physics Letters B, 38, 22 January 2024, 2450192.
[13] Ashish, Gopal K, Singh S, Gupta DN. High-intensity laser pulse interaction with a counter propagating electron beam for terahertz field generation in magnetized plasmas. Optical and Quantum Electronics. 2023,14 May;55(7):605, doi.10.1007/s11082-023-04889-4, Impact Factor = 2.794
[14] Ashish, Singh S. Dispersive features of electrostatic waves in bounded quantum plasma under the effect of ionization. Journal of Astrophysics and Astronomy. 2022 Sep 2;43(2):59, https://doi.org/10.1007/s12036-022-09857-0, Impact Factor = 1.5

[15] Bharti SP, Singh S. Studies of growing waves in Hall thruster beam plasma under the influence of electron temperature. Journal of Astrophysics and Astronomy. 2022 Aug 2;43(2):47, https://doi.org/10.1007/s12036-022-09834-7, Impact Factor = 1.5

[16] Singh S, Malik HK. Effects of initial ion velocity, magnetic field and plasma density profiles in simulating the plasma plume in a Hall thruster. Journal of Astrophysics and Astronomy. 2023 Jan 16;44(1):3, https://doi.org/10.1007/s12036-022-09895-8, Impact Factor = 1.5

[17] Bharti SP, Singh S. The spatial damping of electrostatic wave in Hall thruster beam plasma. Journal of Theoretical and Applied Physics. 2022 Dec 1;16(4):1-6, 10.30495/JTAP.162237, (Scopus)

[18] Singh, S., Luyt, A.S., Bhoopal, R.S. et al. Estimation of Mechanical Properties of Copper Powder Filled Linear Low-Density Polyethylene Composites. J. Vib. Eng. Technol. (2022). https://doi.org/10.1007/s42417-022-00496-x Journal of Vibration Engineering & Technologies. 16 April 2022

[19] Singh et al. Investigations of Physical properties of transparent conducting aluminium-doped zinc oxide films prepared by Sol-gel Method for sensor application, Indian Journal of Pure & Applied Physics (IJPAP)2022

[20] Bharti, S. P.; Singh, S.; Kumar, S.; Meena, S. K.(2021), Electron Beam Plasma Instability in Hall Thruster Devices. Jñānābha, 51 114-124. May 06

[21] R. P Singh, Sukhmander Singh, Reenu Gill, Rishi Kumar, Pradeep Sharma , Gurupal Kumar , Adriaan S. Luyt. Computational studies for the effective electrical conductivity of Copper powder filled LDPE/LLDPE composites. Indian Journal of Pure & Applied Physics (IJPAP) Vol. 58, June 2020, pp. 486-493. Impact Factor 0.653

[22] Jasvendra Tyagi, Sukhmander Singh, Hitendra K. Malik, Effect of dust on tilted electrostatic resistive instability in a Hall thruster. Journal of Theoretical and Applied Physics, 12, 39-43, 2018 (March).

[23] Sukhmander Singh and Saty Prakash Bharti. Studies on growth rate of electron streaming instability in magnetized quantum dusty plasmas, AIP Conference Proceedings 2220, 130060 (2020)

[24] Sukhmander Singh, Dispersion equation for electrostatic ion cyclotron instability under the effect of ionization in a dusty plasma. AIP Conference Proceedings 1953, 140149 (2018-May).

[25] Nidhi Pathak, Sukhdeep Kaur, and Sukhmander Singh, Study of self-focusing of Non Gaussian laser beam in a plasma with density variation using moment theory approach. Citation: AIP Conference Proceedings 1953, 060017 (2018).

[26] O.P. Malik, Sukhmander Singh, Hitendra K. Malik, A. Kumar. Low and high frequency instabilities in an explosion- generated-plasma and possibility of wave triplet . Journal of Theoretical and Applied Physics (2015) Vol. 9 Pgs.75 -80.

[27] O.P. Malik, Sukhmander Singh, Hitendra K. Malik, A. Kumar. High frequency instabilities in an explosion-generated-relativistic-plasma. Journal of Theoretical and Applied Physics (2015) Vol. 9, Pgs.105-110.

[28] H.K. Malik and S. Singh. Resistive instability in a Hall plasma discharge under ionization effect. Physics of Plasmas (2013) Vol. 20, Pgs. 052115 (1-8).

[29] S. Singh, H. K. Malik and Y. Nishida. High frequency electromagnetic resistive instability in a Hall thruster under the effect of ionization. Physics of Plasmas (2013) Vol. 20, Pgs. 102109 (1-7).

[30] S. Singh and H. K. Malik. Role of ionization and electron drift velocity profile to Rayleigh instability in a Hall thruster plasma: cutoff frequency of oscillations. Journal of Applied Physics (2012) Vol. 112, Pgs. 013307(1-7).

[31] H.K. Malik and S. Singh. Conditions and growth rate of Rayleigh instability in a Hall thruster under the effect of ion temperature. Physical Review E (2011) Vol. 83, Pgs. 036406 (1-8).

[32] S. Singh and H.K. Malik. Growth of low frequency electrostatic and electromagnetic instabilities in a Hall thruster. IEEE Transactions on Plasma Science (2011) Vol. 39, Pgs. 1910-1918.

[33] S. Singh and H.K. Malik. Resistive instabilities in a Hall thruster under the presence of collisions and thermal motion of electrons. The Open Plasma Physics Journal (2011) Vol. 4, Pgs. 16-23.

[34] T. Mohanty, S. Dhounsi, P. Kumar, A. Tripathi, D. Kanjilal. 250 keV Ar2+ ion beam induced grain growth in Tin oxide thin films. Surface & Coatings Technology (Elsevier) (2009) 203, Pgs. 2410-2414.

[35] O.P. Malik, S. Singh, H. K. Malik and A. Kumar. Electron Inertia Effect on High Power Electromagnetic Radiation Generated from Explosive and High Frequency Instabilities, International Conference on Recent Trends in Electronics Communication and VLSI, 28-30, September 26, 2013, ASET, Faridabad, India.

Book Chapters publications

[1]Sukhmander Singh, Evolutions of Growing Waves in Complex Plasma Medium in the book Computational Overview of Fluid Structure Interaction IntechOpen, London, United Kingdom, ISBN(print): 978-1-83969-175-1, April 15th 2020, IntechOpen, London, United Kingdom, Nov **2020**

[2] Sukhmander Singh, Waves and Instabilities in E X B Dusty Plasma in the book "Thermophysical Properties of Complex Materials" (ISBN 978-1-78984-889-2) IntechOpen, London, United Kingdom, **December 12th 2019**

[3] Sukhmander Singh, Dynamics of Rayleigh-Taylor Instability in Plasma Fluids in the book Computational Overview of Fluid Structure Interaction IntechOpen, London, United Kingdom, ISBN(print): 978-1-83969-175-1, April 15th 2020

[4] Sukhmander Singh, Hall Thruster: An Electric Propulsion through Plasmas in the book Plasma Science (ISBN 978-1-83962-679-1) IntechOpen, London, United Kingdom, **March 2nd 2020**

[5] Ceramic nanoparticles doped liquid crystals: A review of material properties for display applications Rishi Kumar, Rajpal Singh, Sukhmander Singh, and K.K. Raina, 371-385, IN THE BOOK Advanced Ceramics for Versatile Interdisciplinary Applications, ISBN: 978-0-323-89952-9

Workshop/ school attended:

[1] FDP on Professional Development and Leadership from 6th -10th October 2025 from CURAJ in association with NITTTR Bhopal.

[2] FDP on Evaluation and Setting of Question Paper from 12-16 August 2024, from CURAJ in association with NITTTR Bhopal.

[3] FDP on Advances in Material Characterization and Data Processing (AMCDP-2024) from 15th 20th July, 2024 from Anurag University, Venkatapur , Ghatkesar, Medchal (dist) Hyderabad

[4] Faculty Development Program on Recent Advancement in Science and Technology, Department of Basic Sciences, Alliance University, March 06-10, 2023, Alliance University

[5] faculty development program, on recent trends in optics and plasma physics, Department of Physics and Materials Science, and Engineering, JIIT Noida, from 21st - 27th July 2022, JIIT Noida

[6] FDP on Meaningful Research & Intellectual Property Rights" from Teaching Learning Centre, Ramanujan College, University of Delhi, from 04- 10 July, 2022.

[7] FDP on "theoretical and practical aspects in applied physics" (TAPAAP-2021) from 24th September – 28th September, 2021 organized by Radha Govind Group of Institutions Meerut, Uttar Pradesh, India.

[8] Attended five days Faculty Development Programme (FDP) from 23/08/2021 to 27/08/2021 on "Quantum Information Processing & Applications organized by department of computer Science Punjab, Central University of Punjab, Bathinda.

[9] Refresher Course in Statistical Physics Sir P T Sarvajanik College of science, Surat, Gujarat from 10th to 22th June 2019, Indian academy of Science Bangalore.

[10] Attended the UGC 105th orientation programme conducted by the UGC HRDC, Rajasthan University, Jaipur on 4-30 December 2017.

[11] Attended 3 weeks SERB school on High Intensity Laser plasma Interaction :Theory and Simulation at IIT Delhi, organized by prof V K Tripathi (May 5-23, 2014) .

[8] Attended in a workshop for the Paper Science and Life, organized by Delhi university on June 21-22 (2013).

Conferences presentations:

1. "Investigation of Electromagnetic Resistive Instabilities in Hall Thruster: Effect of Axial Magnetic Field Components" International Workshop on Cold Plasma Technology and Applications, 6-8 February 2025, BIT Mesra, Off-Campus Jaipur, Rajasthan, India

2. Sukhmander Singh, impact of dust charged on electromagnetic resistive instability in a hall thruster, third International Conference on Plasma Theory and Simulations (PTS-2023, 21-23 sep), SPS-JNU DELHI
3. Sukhmander Singh, Streaming instabilities in magnetized quantum dusty plasmas, in the 37th National Symposium on Plasma Science and Technology at IIT Jodhpur, Rajasthan, 12-14 December, 2022
4. Sukhmander Singh. Electrostatic and electromagnetic Ionization driven instabilities in Hall thrusters. 2nd International Conference on Plasma Theory and Simulation (online) 20 – 22 June, 2022, Department of Physics, University of Lucknow, India
5. Review on Instabilities and Rotating Spatial Structures in Hall Thruster, in Two Days National Conference on "Chandra's Contribution in Plasma Astrophysics". OCT 19-20, 2021, SPS JNU
6. Sukhmander Singh. Numerical Studies of Dissipative Instabilities in Hall Thruster Plasma, in "International e-Conference on Plasma Theory and Simulations (PTS-2020)", from 14-15, September 2020, organized by Department of Pure and Applied Physics, Guru Ghasidas Central University, Bilaspur, C.G. (India).
7. Sukhmander Singh. Study of Rayleigh Taylor Instability in the Ionization regions in Quantum Plasmas, 16th May 2020 of the International E - Conference held at Department of Physics, Ch. Charan Singh University, Meerut, UP, INDIA.
8. Sukhmander Singh. studies for stabilizations of waves and instabilities in a density gradients hall thruster plasmas, ICPSA 2019: 12th International Conference on Plasma Science and Applications (ICPSA 2019), Department of Physics, University of Lucknow, Lucknow, India, November **11-14, 2019**
9. Sukhmander Singh. Effect of Magnetic Drift Velocity on Gradient Driven Instabilities in a Hall Thruster. The 33rd National Symposium on Plasma Science & Technology (PLASMA-2018), December 4- 7, 2018 held at Department of Physics and Astrophysics, University of Delhi, Delhi In Association with Plasma Science Society of India
10. Sukhmander Singh. Introduction to Plasma Based Propulsion Systems: Hall Thrusters in Rajasthan Science Congress (RSC 2018) held on Oct.13-15, 2018 at Central Univ. of Rajasthan.

11. Sukhmander Singh. Dispersion Equation for electrostatic Ion Cyclotron Instability Under the Effect of Ionization in a Dusty Plasma, in the 2nd International Conference on Condensed Matter & Applied Physics Engineering College, Bikaner. Karni Industrial Area, Pugal Road, Bikaner (Rajasthan) India on November 24-25, 2017.
12. Sukhmander Singh. Density Gradients Instability in a Hall Discharge Plasmas. International conference on High Power Coherent Radiation Generation & its Interaction with Matter. Held at Samrat Ashok Technological Institute,Vidisha (M.P.) February 12-14, 2016.
13. S. Singh. Future Space Technology: Hall Effect Thruster. IISF-2015: Young Scientists' Meet 2015, (Paper code 31: Design & Manufacturing Technologies for 'Make In India') at IIT Delhi, New Delhi, December 04-08, 2015.
14. S. Singh. Stability Analysis of Electric Propulsion Engine. IISF-2015: Young Scientists' Meet 2015, (Paper code: 77. Indigenous Science & Technology) at IIT Delhi, New Delhi. December 04- 08, 2015.
15. S Singh, R Malik, J Tyagi and H K Malik. Two Dimensional Analyses for Plasma Acceleration Process in a Hall Thrusters. 30th National Symposium on Plasma Science & Technology, PLASMA December 1-4, 2015
16. J. Tyagi, S. Singh and H. K. Malik . Growth Rate of Rayleigh Taylor Instability in a Hall Thruster Dusty Plasma. International Conference on Research Trends in Interdisciplinary Sciences : Opportunities and Challenges (RTISOC-2014) Feb. 28 - March 1, 2014, M. M. College, Modinagar-201204 (U. P.) India.

PhD Thesis supervised

1. Saty Kumar Bharati, on Investigations on Electrostatic Resistive Instabilities in Hall Thruster: Effects of Electron Beam Density and Axial-Radial Components of Magnetic Field" (Awarded 2025)

2. Rohit Kumar (2021PHDPH004) on "Terahertz Radiation generation using nonlinear mixing Mechanism.

3. Ashish (2020PHDPH002) on "Numerical Simulation of THz Generation by Laser Plasma Interaction" AWARDED on 19 June 2025 (Awarded 2025)

M.Sc. Theses Supervision:55

Research Project

Numerical Modeling for the Stabilization of Plasma in a Hall Thruster. UGC start up grants 11 march 17-19 (Rs. 10 lacs).

Organized

Programme/ FDP Coordinator

1. Programme Coordinator of NEP Orientation and Sensitization Programme under the UGC Malaviya Mission Teacher TrainingProgrammes (MMTTP) during 08-17September, 2025.
2. Programme Coordinator of NEP Orientation and Sensitization Programme under the UGC Malaviya Mission Teacher TrainingProgrammes (MMTTP) during 02-11 September, 2024.
3. Programme Coordinator of Short Term Programme on IKS under the UGC Malaviya Mission Teacher TrainingProgrammes (MMTTP) during 10-15 Nov 2025.
4. Programme Coordinator of Two-week Online Multidisciplinary Refresher Course on Reimagining & Revamping Higher Education in India, 17-29 November 2025.

Other Responsibilities in the University

1. Worked as Organizing Committee member in the International Symposium on Photonics and Plasmonics (ISPP-2019), during 23-24 September 2019.
2. Worked as Organizing Committee member in the International Conference on Complex Dynamical Systems and Applications (CDSA 2020) held at CURaj during Feb 21-23, 2020.
3. Worked as Organizing Committee member in the National Symposium Technologically Advanced Functional Materials, (MARCH 16-17, 2017).
4. Worked as Organizing Committee member in conducting various Capacity-Building Programmes Organized by Central University of Rajasthan in association with NITTTR, Bhopal.
5. Worked as Organizing Committee member in conducting various NEP- orientation and sensitization programmes Organized by Central University of Rajasthan under MMTTC-CURAJ

6. Member of the School Board of School of Education
7. Member of Training and Development of Employees Committee
8. Member of the committee for Convocation Ceremony.
9. Member of the scrutiny committee for the post of Assistant Professor