
Education

- 2005-2011 **Ph.D. in Physics**, Institute for Plasma Research (IPR), Gandhinagar, India.
2002-2004 **M.Sc. in Physics**, University of Allahabad, Allahabad, India.
1999-2002 **B.Sc.**, University of Allahabad, Allahabad, India.

Current Position

- Assistant Professor Department of Physics, Sardar Vallabhbhai National Institute of Technology (SVNIT), Surat

Professional Experience

- May 2019 - May 2021 **UGC-Kothari Postdoctoral Fellow**, Department of Physics, Indian Institute of Science(IISc.), Bangalore.
February 2019 - May 2019 **Research Associate**, Institute for Plasma Research (IPR), Gandhinagar.
August 2017 - August 2018 **Associate Research Scientist**, Applied Physics Department, Columbia University, In the City of New York, NY, USA.
July 2017 - August 2017 **Postdoctoral Fellow**, Physical Research Laboratory (PRL), Ahmedabad, India.
July 2014 - January 2017 **Research Scientist**, Institute for Plasma Research (IPR), Gandhinagar, India.
May 2012 - March 2014 **Postdoctoral Research Scholar**, Department of Chemistry, University of Iowa, Iowa, USA.
March 2011 - May 2012 **Postdoctoral Fellow**, Institute for Plasma Research (IPR), Gandhinagar, India.

Awards, Fellowships, Honours

- ★ **"UGC-Dr. D.S. Kothari Postdoctoral Fellowship (Higher Fellowship)"**
Awarded by University Grants Commission(UGC), New Delhi, in the year 2019.
- ★ **"Buti Young Scientist Award"**
Awarded by Buti Foundation in the year of 2009.
- ★ **"UGC-Dr. D.S. Kothari Postdoctoral Fellowship (Higher Fellowship)"**
Awarded by University Grants Commission(UGC), New Delhi, in the year 2017 (Not availed!)

- ★ **Junior Research Fellowship (September 2005 - August 2007) and Senior Research Fellowship (September 2007 - March 2011)**
Awarded by Department of Atomic Energy, India for pursuing Ph.D. at Institute for Plasma Research (IPR), Gandhinagar, India.
- ★ **"Qualified Joint Entrance Screening Test (JEST)"**
In year 2005 for pursuing Ph.D. in physics within country.

Research Interests

- ★ Direct Numerical Simulation (DNS) of magnetohydrodynamics (MHD) turbulence for the statistical characterization of the fluctuation of the velocity and magnetic fields (at high Reynolds numbers).
- ★ Computational modeling of conventional and non-conventional ion sources.
- ★ Particle-In-Cell (PIC) based computer simulation for studying the phenomena observed in inertial confinement fusion devices, laser plasma interaction phenomena.
- ★ In general I am interested in studying the various instabilities such as weibel instability, hydrodynamic instabilities - Kelvin-Helmholtz (KH) and Rayleigh-Taylor (RT) instability, two stream instability, filamentation etc. occurring in the plasma.
- ★ Data analysis of the shots captured in the experiment to understand the underlying physics.
- ★ Computational (using molecular dynamics simulation) study of soft condensed matters to understand its structural and dynamical properties

Publications

1. *Sharad K. Yadav*, Hideaki Miura and Rahul Pandit, "Statistical Properties of three-dimensional Hall Magnetohydrodynamics Turbulence", **May, 2021** <https://arxiv.org/abs/2105.13390>.
2. *Sharad K. Yadav* and R. K. Singh, "Numerical study of the effect of atomic mass of the ambient gas on the expansion and the lateral interactions of LBO plumes", *Journal of Physics D: Applied Physics*, **54**, 075201, 2021.
3. *Sharad K. Yadav*, R. K. Bera, D. Verma, A. Das and P. Kaw, "Propagation of low frequency electromagnetic disturbances in plasma", Accepted in *Contributions to Plasma Physics*, **August 2020** (DOI: 10.1002/ctpp.202000101).
4. *Sharad K. Yadav*, B. G. Patel, R. K. Singh, A. Das, P. K. Kaw and A. Kumar, "Numerical study of the lateral interaction of two plasma plumes", *Journal of Physics D: Applied Physics* **50**, 355201, 2017.
5. C. A. Rumble, A. Kaintz, *Sharad K. Yadav*, B. Conway, J. C. Araque, G. Baker, Claudio J. Margulis, and M. Maroncelli, "Rotational dynamics in ionic liquids from NMR relaxation experiments and simulations: benzene and 1-ethyl-3-methylimidazolium", *J. Phys. Chem. B* **120(35)**, pp 9450-9467, 2016.
6. J. C. Araque, *Sharad K. Yadav*, M. Shadeck, M. Maroncelli and Claudio J. Margulis, "How is diffusion of neutral and charged tracers to the structure and dynamics of a room temperature ionic liquids ? large deviations from stokes-einstein behavior explained", *J. Phys. Chem. B* **119(23)**, pp 7015-7029, 2015 (for June issue this paper was selected for cover page).

7. Sharad K. Yadav, P. K. Kaw, A. Das, S. K. Pathak, S. Joisa, D. Raju and SST-1 Team, "Determination of Plasma Temperature in Steady State Tokamak (SST-1)", **IPR/TR-359/2015**, October, 2015.
8. A. Das, Sharad K. Yadav, P. K. Kaw and S. Sengupta, "Collisionless stopping of electron current in an inhomogeneous EMHD plasma", *Pramana - Journal of Physics* **77**, 949, 2011.
9. Sharad K. Yadav, and A. Das, "Nonlinear studies of fast electron current pulse propagation in a two dimensional inhomogeneous plasma", *Phys. Plasmas* **17**, 052306, 2010.
10. G. Gaur, S. Sundar, Sharad K. Yadav, A. Das, P. K. Kaw, and S. Sharma, "Role of natural length and time scales on shear driven 2D electron magnetohydrodynamic instability", *Phys. Plasmas* **16**, 072310, 2009.
11. Sharad K. Yadav, A. Das, P. K. Kaw, and S. Sengupta, "Anomalous energy dissipation of electron current pulses propagating through an inhomogeneous collisionless plasma medium", *Phys. Plasmas* **16**, 040701, 2009.
12. Sharad K. Yadav, A. Das, and P. K. Kaw, "Propagation of electron magnetohydrodynamic structures in a 2D inhomogeneous plasma", *Phys. Plasmas* **15**, 062308, 2008.
13. S. Kahaly, Sharad K. Yadav, W. M. Wang, S. Sengupta, Z. M. Sheng, A. Das, P. K. Kaw and G. Ravindra Kumar, "Near complete absorption of intense, ultrashort laser light by sub-lambda gratings", *Phys. Rev. Lett.* **101**, 145001, 2008.
14. S. Kahaly, G. R. Kumar, Sharad K. Yadav, S. Sengupta, A. Das, and P. K. Kaw, "Hot electron generation by highly efficient absorption of high intensity femtosecond laser light in plasma generated on sub-lambda gratings", *Journal of Physics: Conference Series* **112**, 022102, 2008.

Full paper in national conferences

15. Sharad K. Yadav, A. Das, P. Kaw and S. Sengupta, "Electron current pulse propagation and its anomalous dissipation through inhomogeneous plasma", *24th National Symposium on Plasma Science & Technology (PLASMA-2009)*, 8-11 December, 2009, National Institute of Technology(NIT), Hamirpur (HP).

Invited/Oral Presentations

1. "Numerical Simulation of three dimensional Hall magnetohydrodynamic (HMHD) for the study of statistical properties" at 7th Indian Statistical Physics Conference Meeting (ISPCM-2020), February 19 - February 21, 2020, International Centre for Theoretical Physics (ICTS), Bangalore, India (Talk)
2. "Hydrodynamics simulation of plasma plume for the study of the lateral interaction of two plasma plumes" at Institute for Plasma Research (IPR), Gandhinagar, India, February 07, 2019 (Invited talk)
3. "Rotational Dynamics of Cation in Neat Ionic Liquids and Mixture of Ionic liquids with Neutral Solvent" at Department of Physics, Indian Institute of Science (IISc.), Bangalore, Karnataka, India, February 02, 2017 (Invited talk)
4. "Modeling and simulation of laser generated plasma plume" at Dhirubhai Ambani Institute of Information and Communication Technology (DAICT), Gandhinagar, India, November 10, 2016 (talk)

5. "Study of the lateral interactions of two LBO plasma plumes in close proximity via hydrodynamic simulation" at Indian Institute of Technology (IIT)- Bombay, Mumbai, India, October 20, 2016 (Invited talk)
6. "Numerical modeling of laser-blow-off plume: lateral interactions of two plumes in presence of background pressure" at 18th International Congress on Plasma Physics (ICPP), June 27- July 1, 2016, Kaohsiung, Taiwan (talk)
7. "Study of the rotational dynamics of cation in pure ionic liquids and in its mixture with neutral solvent via MD simulation" at Conference on Research Progress in Physical Sciences, September 7-8, 2016, University and Institute of Advanced Research (UIAR), Gandhinagar, India (oral)
8. "Collisionless mechanism of energy dissipation, collimating and guiding behavior of electron pulses in over dense plasma", at Indian Institute of Technology (IIT) Patna, India, November 9, 2015 (talk)
9. "Rotational dynamics of cation in ionic liquids and ionic liquids mixture" at Institute for Plasma Research (IPR), Gandhinagar, India, May 19, 2014 (Invited talk)
10. "Electron current pulse propagation and its anomalous dissipation through inhomogeneous plasma", 24th National Symposium on plasma Science and Technology, December 11-13, 2009, NIT, Hamirpur, India (talk awarded by "Buti Young Scientist Award")

Paper Presented in International/National Conferences

1. *Sharad K. Yadav*, Nadia B. Padhan and Rahul Pandit, "Statistical Properties in three-dimensional (3D) Hall Magnetohydrodynamics (HMHD) Turbulence", Conference on Plasma Simulation (CPS) - 2020, Institute for Plasma Research (IPR), Gandhinagar, India, January 23-24, 2020.
2. A. Sen, *Sharad K. Yadav*, G. Ganguli and C. Crabtree, "Stimulated Fore-wake excitations from Moving Charged Objects in the ionosphere", ICEAA-IEEE APWC 2019, Granada, Spain, 9-13 September 2019.
3. *Sharad K. Yadav*, Nadia B. Padhan and Rahul Pandit, "Direct Numerical Simulations of three-dimensional (3D) Hall Magnetohydrodynamics (HMHD) Turbulence", In-house Symposium held in the Department of Physics, Indian Institute of Science (IISc.), Bangalore, India, November 22-23, 2019.
4. *Sharad K. Yadav*, R. K. Singh, B. G. Patel, A. Das, P. K. Kaw, and A. Kumar, "Numerical modeling of laser-blow-off plume: lateral interactions of two plumes in presence of background pressure", 18th International Congress on Plasma Physics (ICPP 2016), Kaohsiung, Taiwan, June 27- July 1, 2016.
5. J. C. Araque, *Sharad K. Yadav*, M. Shadeck, M. Maroncelli, and C. J. Margulis, "Soft jumps and stiff cages: Link between the structural landscape of room temperature ionic liquids and the dynamics of neutral and charged tracers", 24th edition of the Midwest thermodynamics and statistical mechanics conference at Iowa State University, May 28-29, 2015, Ames, IA, USA.
6. J. C. Araque, *Sharad K. Yadav*, M. Maroncelli and C. J. Margulis, "Disparity in the diffusion mechanism of neutral vs. charged solutes in ionic liquids", The First Gordan Research Conference on Ionic Liquids, August 17 -22, 2014, Newry, ME, USA.

7. J. Kohanoff, C. Xu, A. Durumeric, H. K. Kashyap, *Sharad K. Yadav*, A. Kaintz, C. Rumble, M. Maroncelli, C. J. Margulis, "Dynamics of excess electrons and other solutes in room temperature ionic liquids", Thirty-fifth DOE Solar Research Meeting, June 2–5, 2013, Maryland, USA.
8. *Sharad K. Yadav*, A. Das, P. K. Kaw and S. Sengupta, "Theoretical description of electron current pulse transport and stopping through plasma and its implications to fast ignition (FI)", International Conference on Inertial Fusion Sciences and Application (IFSA 2009), Sept. 6–11, 2009, Sanfrancisco, USA.
9. *Sharad K. Yadav*, A. Das, and P. Kaw, "Propagation of 2D nonlinear EMHD coherent structures in the inhomogeneous plasma", Summer College on Plasma Physics held at the Abdus Salam International Center for Theoretical Physics (ICTP), Trieste, Italy.
10. *Sharad K. Yadav*, A. Das, and P. K. Kaw, "Propagation of electron magnetohydrodynamics structures in a two dimensional inhomogeneous plasma", 23rd National Symposium on Plasma Science and Technology, December 10–13, 2008, BARC, Mumbai, India.
11. A. Kaintz, C. Rumble, *Sharad K. Yadav*, C. J. Margulis and M. Maroncelli, "Rotational Dynamics in Ionic Liquids- NMR and MD studies", Thirty DOE Solar Research Meeting, June 2–5, 2013, Maryland, USA.
12. *Sharad K. Yadav*, A. Das, P. K. Kaw and S. Sengupta, "Electron Current pulse propagation and its anomalous dissipation through inhomogeneous plasma", 24th National Symposium on Plasma Science and Technology, December 11–13, 2009, NIT, Hamirpur, HP, India.
13. S. Kahaly, G. R. Kumar, *Sharad K. Yadav*, S. Sengupta, A. Das and P. K. Kaw, "Sub-lambda gratings surface plasmons, hotter electrons and brighter X-ray sources: enhanced absorption of intense, ultrashort laser light by tiny surface modulations", 22nd National Symposium on Plasma Sciences and Technology, December 6–10, 2007, IPR, Gandhinagar, India.
14. *Sharad K. Yadav et. al.*, "Monte carlo simulation of Toroidal electron plasmas and comparison with a meanfield theory", 21st National Symposium on Plasma Sciences and Technology, December 19–22, 2006, MNIT, Jaipur, India.
15. G. Gaur, S. Sundar, A. Das, P. K. Kaw and *Sharad K. Yadav*, "Non-linear simulations of a 2D sheared electron flow in the presence of in-plane equilibrium magnetic field", 23rd National Symposium on Plasma Science and Technology, December 10–13, 2008, BARC, Mumbai, India.