

Ratan Kumar Bera, PhD

The Center for Space Plasma and Aeronomic Research (CSPAR)
The University of Alabama in Huntsville, Huntsville, AL 35899
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Education

Ph.D. in Physics

Institute for Plasma Research (IPR), Gujarat, India

2012–2018

Dissertation title: “Fluid simulation of electron beam driven wakefield in a cold plasma”

Master of Science (M.Sc.) in Physics

Indian Institute of Technology Bombay, Mumbai, India

2010–2012

Bachelor of Science (B.Sc.) in Physics

University of Calcutta, West Bengal, India

2007–2010

Professional appointments

Postdoctoral Research Assistant III

*The Center for Space Plasma and Aeronomic Research
University of Alabama in Huntsville, Huntsville, AL 35899*

March 2021–present

Postdoctoral Research Associate

*Kevin T. Crofton Department of Aerospace and Ocean Engineering
Virginia Tech, Blacksburg, VA 24061*

September 2019–March 2021

Postdoctoral Fellow

*Basic Theory and Simulation Division
Institute for Plasma Research, Bhat, Gandhinagar, Gujarat 382428, India*

February 2018–July 2019

Awards

1. “PSSI Poster Award” by PSSI conference, SINP, Kolkata, India, **December 2015**.
2. “PSSI Poster Award” by PSSI conference, Kerala, India, **December 2014**.

Publications

1. “Boundary driven unconventional mechanism of macroscopic magnetic field generation in beam-plasma interaction”, Amita Das, Atul Kumar, Chandrasekhar Shukla, **Ratan Kumar Bera**, Deepa Verma, Devshree Mandal, Ayushi Vashishta, Bhavesh Patel, Y. Hayashi, K. A. Tanaka, G. Chatterjee, Amit D. Lad, G. Ravindra Kumar, and Predhiman Kaw, *Phys. Rev. Research*, **2**, 033405 (2020)
2. “Nonlinear propagation of low-frequency electromagnetic disturbances in plasmas”, Sharad Kumar Yadav, **Ratan Kumar Bera**, Deepa Verma, Predhiman Kaw, and Amita Das, *Contributions to Plasma Physics* **e20200101**(2020)
3. “Effect of transverse beam size on the wakefields and driver beam dynamics in plasma wakefield acceleration schemes”, **Ratan Kumar Bera**, Devshree Mandal, Amita Das, and Sudip Sengupta, *AIP Advances* **10**, 025203 (2020)
4. “Observation of 1-D time-dependent non-propagating laser plasma structures using fluid and PIC codes”, Deepa Verma, **Ratan Kumar Bera**, Bhavesh Patel and Amita Das, *Phys. Plasmas* **24**, 123111 (2017)
5. “The stability of 1-D soliton in the transverse direction”, Deepa Verma, **Ratan Kumar Bera**, Amita Das, and Predhiman Kaw, *Phys. Plasmas* **23**, 123102 (2016)

6. "Relativistic electron beam driven longitudinal wake wave breaking in a cold plasma", **Ratan Kumar Bera**, Arghya Mukherjee, Sengupta, and Amita Das, *Phys. Plasmas* **23**, 083113 (2016)
7. "Fluid simulation of relativistic electron beam driven wakefield in a cold plasma", **Ratan Kumar Bera**, Sudip Sengupta, and Amita Das, *Phys. Plasmas* **22**, 073109 (2015)

Undergraduate/graduate projects supervised

1. Project title: "Fluid Simulation of ultra-intense laser-driven wakefield excitation in a cold plasma"

Student: **Vraj Patel**, Department of Physics, IIT(ISM) Dhanbad, Jharkhand, India, **Year - 2018**

(A three months project for the partial fulfillment of 3rd year in B. Tech. course)

Supervised jointly with Prof. Amita Das.

2. Project title: "Quantum mechanical effects in plasmas"

Student: **Kamalendu Paul**, Department of Physics, National Institute of Science Education and Research, Odisha, India, **Year - 2018**

(A three months project for the partial fulfillment of 2nd year in M. Sc. coursework)

Supervised jointly with Prof. Amita Das.

3. Project title: "Study of Acoustic and Langmuir Waves using Fluid Simulations"

Student: **M. Vardharajan**, Department of Physics, St. Joseph's College, Bangalore, India, **Year - 2016**

(A three months project for partial fulfillment of 3rd year of B. Sc. (Graduation))

Supervised jointly with Prof. Sudip Sengupta.

4. Project title: "Effect of the external magnetic field on the relativistic electron beam driven wakefield in a cold plasma"

Student: **Anup Borade**, Department of Physics, Indian Institute of Technology Madras, India, **Year - 2015**

(A three months project for partial fulfillment of 3rd year of B. Tech. course work)

Supervised jointly with Prof. Amita Das.

Conferences and school presentations

• Invited talk.....

1. 4th Asia Pacific Conference on Plasma Physics (AAPPS-DPP) as e-conference, (26-31 October, 2020).

2. ASian core program for High energy density science Using intense LASer photons (ASHULA), Lonavala, Maharashtra, India, (20-21 January, 2015).

• Oral presentations.....

1. 62nd Annual Meeting of American Physical Society-Division of Plasma Physics (APS-DPP) virtual meeting, (9-13 November, 2020).

2. 32nd National Symposium on Plasma Science and Technology, Institute for Plasma Research, Gandhinagar (Gujarat), Gandhinagar, Gujarat, India, (7-10 November 2017).

3. 4th PSSI-Plasma Scholars' Colloquium, Jadavpur University, Kolkata, India, (6-17 August, 2015).

• Poster presentations.....

1. 59th Annual Meeting of American Physical Society-Division of Plasma Physics (APS-DPP), Milwaukee, USA, (23-28 October 2017).

2. 10th Asia Plasma and Fusion Association Conference. Institute for Plasma Research, Gandhinagar, India, (14-18 December 2015).

3. International School on Ultra-Intense Lasers (ISUIL), 4-9 October 2015, Russia, (**4-9 October 2015**).
4. 30th National Symposium on Plasma Science and Technology (PSSI - 2015). Saha Institute For Nuclear Physics (SINP), Kolkata, India, (**1-4 December, 2015**).
5. 29th National Symposium on Plasma Science and Technology (PSSI - 2014). Mahatma Gandhi University, Kottayam, India, (**8-11 December, 2014**).

Professional memberships

- * Life member, Plasma Science Society of India (PSSI), Ahmedabad, India, since 2014.
- * Student member, American Physical Society (APS), USA