

Curriculum Vitae

Dr. Herendra Kumar

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Adhoc Panel: Category-I/ OBC/ S.No.-18

Aiming high for a challenging position in Education Industry where my knowledge, experience and skills, will greatly enhance the organizations success and my career growth as well.

Education and Qualifications

2019	Ph.D. (Physics)	Awarded	University of Delhi (DU), Delhi
2012	M.Sc. (Physics)	71.13%	Aligarh Muslim University (AMU), Aligarh, UP
2010	B.Sc. (Hons.)	66.27%	Aligarh Muslim University (AMU), Aligarh, UP
2007	Senior Secondary School	70.00%	S.D.A. Inter College (UP Board), Karanvas, Bulandshahar
2005	High School	60.33%	V.M.A.B. High School (UP Board), Dibai, Bulandshahar

National and State Level Test Cleared

- 2013 Council of Scientific & Industrial Research- National Eligibility Test (CSIR- NET) AIR-31
- 2014 Graduate Aptitude Test in Engineering (GATE) AIR-258
- 2017 Himachal Pradesh State Eligibility Test (HPSET) AIR-2
- 2018 Assistant Professor Exam (UKPSC) Air-45
- 2019 Council of Scientific & Industrial Research Research Associate(CSIR- RA) AIR-3

Teaching and Research Position (Experience)

- 13 Feb to 25 May-19 Assistant Professor BCAS, University of Delhi, Delhi
- 1-Jan to 11-Feb-19 Guest Faculty
- Bhagwan Parushram Institute of Technology, IP University, Delhi
- 24-Aug-18 to 12 Feb-19 Assistant Professor ARSD College, University of Delhi, Delhi
- 29-July to 23 Aug-18 Guest Faculty IHE, University of Delhi, New Delhi
- 2017 Visiting Lecturer Shri Guru Dronacharya Campus, Gurgaon
- 2013-15 Research Fellow Inter University Accelerator Center, New Delhi

Computer Programming / Software Skills

C/C++, FORTRAN, MATLAB, SciLab/ MS Office, Latex, Octave, GNU Plot, Origin, Qti Plot, and Excel

Subjects Taught

- Theory: Mechanics and Mathophysics Mechanics: B.Sc. Ist year
- Theory: Applied Optics (B.Sc. IIIrd year) and Renewable Energy and Energy Harvesting (B.Sc. IInd year)
- Experimental: Mechanics Lab (B.Sc. Ist year) and Quantum Mechanics SciLab (B.Sc. IIIrd year)
- Theory and Experimental : Mechanics (GE) and Computational Physics: B.Sc. Ist year
- Theory and Experimental: Thermal Physics (GE): B.Sc. IIIrd year
- Theory: Classical Dynamics: B.Sc. IIIrd year
- Experimental: Electromagnetic Theory and Elements of Modern Physics :B.Sc. Ist year
- Theory and Experimental: B.Tech. Ist/2nd/3rd year (Core paper)

Faculty Course

1. Faculty Development Programme on "Sustainable Development" under "STAR College Scheme (DBT)" conducted during 15 - 22 October 2018, Atma Ram Sanatan Dharma College, University of Delhi, Delhi, India.

Curriculum Vitae

PhD: Experimental Molecular Physics

- Affiliation: Department of Physics and Astrophysics, University of Delhi, Delhi- 110007, India
- Research Broad Area: Atomic and Molecular Physics
- Research Topic: Dissociation Dynamics of Tri-Atomic Molecular Ions
- Research Interest:

(a) Work done: I did various experiments at Inter University Accelerator Centre (IUAC) on collision between simple tri-atomic molecules, e.g. CO₂ and slow highly charged ions (HCI) from electron cyclotron resonance (ECR) ion source for studying two & three-body dissociation dynamics by using a technique of recoil ion momentum spectroscopy (RIMS). I observed set of two/three fragment ions in coincidence from the dissociation of resulted molecular ions in experiments. Further, I did the analysis of collected data to explore the features of dissociation dynamics. I focused mainly on various objectives such as, (1) the geometry of the dissociating molecular ion same as that of neutral molecule, (2) which bond breaks preferentially and what is its probability, (3) there any preferential decay channel of dissociating molecular ion, (4) which electronically excited energy levels are involved in a dissociation, (5) the angular distribution of the fragment ion of molecular ion is isotropic, and (6) there any intra-molecular bond rearrangement active. I have also studied the variation of plasma potential of ECR ion source with its input parameters by using a retarding plate analyzer in unison with the deceleration assembly coupled to one of the beam lines of low energy beam facility.

(b) A view into future: In the area of ion induced dissociation of molecules, I will try to gain knowledge about H-migration in polyatomic hydrocarbon molecules like CH₃X (where X= H, OH, F, Cl, Br and I). In these molecules, the terminal hydrogen atoms rearrange among themselves (intra molecular rearrangement) to form entities as H₃⁺ and H₂ which are bound state. The kinetics of this rearrangement differs in different molecules. I will explore the dissociation dynamics, states, electronic properties and symmetries of these molecules experimentally and specially gain knowledge into origin and dynamics of H₃⁺ molecular ion formation by using RIMS. Further, I will plan to check the role of interaction strength (q/v) on dissociation dynamics of ion induced molecular ion. I would like to study the ion-induced collision on biologically relevant targets e.g., sugar and angular distribution of products as recoil electrons and ions in this collision reaction by using RIMS and charge state analyser setup. I would also like to measure relative intensities as a function of X-ray wavelengths, which are produced due to the collisions of highly energetic electrons within the plasma of ECR ion source by using a high resolution bent-crystal x-ray spectrometer. The different input parameters of ECR ion source will be used to check their effect on this measure relative intensities.

Research Publications

1. "Three-body dissociation of OCS³⁺ : separating sequential and concerted pathways", Herendra Kumar, Pragya Bhatt, C. P. Safvan and Jyoti Rajput, J. Chem. Phys. , 148, 064302 (2018).
2. "Formation of H₂⁺ and H₃⁺ in slow highly charged ion collisions with NH₃ ", Pragya Bhatt, T. Sairam, Ajit Kumar, Herendra Kumar, and C. P. Safvan, Phys. Rev. A , 96, 022710 (2017).
3. "Low energy HCI beam facility at IUAC: Measurement of the plasma potential and ion energy distributions", T. Sairam, Pragya Bhatt, Ajit Kumar, Herendra Kumar, and C. P. Safvan, Physics of Plasma, 22, 113503 (2015).
4. "Double ionization and delayed ionic dissociation of ethylene", K. Yokokawa, A. Mizumura, J. Matsumoto, H. Shiromaru, P. Bhatt, H. Kumar, C. P. Safvan, Phys. Rev. A , 98, 062708 (2018).
5. "Angular distribution of fragments of OCS^{q+} , generated by Xe⁹⁺ ion impact", Herendra Kumar, Pragya Bhatt, C. P. Safvan and Jyoti Rajput, J. Chem.Phys. (To be submitted).
6. "Differentiating three-body dissociation pathways of triply charged symmetric bent tri-atomic molecule", Herendra Kumar, Pragya Bhatt, C. P. Safvan and Jyoti Rajput (In preparation).
7. "Angular distributions in two body breakup of OCS^{q+} ions", Herendra Kumar, Pragya Bhatt, C. P. Safvan and Jyoti Rajput, J. Phys.: Conf. Ser., 875, 102036 (2017).
8. "Three-body dissociation of OCS³⁺ : separating sequential and concerted pathways", Herendra Kumar, Pragya Bhatt, C. P. Safvan and Jyoti Rajput, J. Phys.: Conf. Ser., 875, 102006 (2017).

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9. "Multiple ionization and dissociation of ethylene induced by collision of Xe 9+ ", K. Yokokawa, J. Matsumoto, H. Shiromaru, P. Bhatt, H. Kumar, C. P. Safvan, J. Phys.: Conf. Ser. 875, 102017 (2017).
10. "Ionization and electron capture in 240 keV Kr 8+ collisions with CO 2 ", Pragma Bhatt, T. Sairam, A. Kumar, H. Kumar, and C. P. Safvan, J. Phys.: Conf. Ser., 635, 032058 (2015).
11. "Measurement of Plasma Potential using Deceleration technique", T. Sairam, Pragma Bhatt, Ajit Kumar, Herendra Kumar, J. Rajput, and C. P. Safvan, J. Phys. : Conf. Ser., 635, 022047 (2015).
12. "Separating Sequential and Concerted Dissociation Pathways of OCS 3+ ", Herendra Kumar, Pragma Bhatt, C. P. Safvan and Jyoti Rajput, Physics of Highly Charged Ions (Accepted).
13. "Delayed ionic dissociation of doubly ionized ethylene produced by highly-charged ion collision", J. Matsumoto, K. Takahashi, A. Mizumura, K. Yokokawa, H. Kumar, P. Bhatt, C. P. Safvan and H. Shiromaru, Physics of Highly Charged Ions (Accepted).

Oral Presentation at National and International Conference/ Seminar

1. Topic "Fragmentation Dynamics of Multiply Charged Carbonyl Sulphide Molecule (OCS q+)" at "7 th Topical Conference of the Indian Society of Atomic and Molecular Physics (ISAMP-TC7)" conducted during 6- 8 January 2018, IIT and IISER, Tirupati, India.
2. Topic "Three-body Dissociation of OCS 3+ : Separating Sequential and Concerted pathways" at "New Trends in Nanotechnology and Applications (NTNA-2018)" conducted during 27 - 28 September 2018, Atma Ram Sanatan Dharma College, Delhi University, Delhi, India.

National and International Conference

1. "21 th National Conference on Atomic and Molecular Physics (NCAMP)" conducted during January, 2017, PRL, Ahmedabad.
2. "30 th International Conference on Photonic, Electronic and Atomic Collisions" conducted during 25 July -1 August 2017, Cairns, Australia.
3. "7 th Topical Conference of the Indian Society of Atomic and Molecular Physics (ISAMP-TC7)" conducted during 6 - 8 January 2018, IIT and IISER, Tirupati, India.

Workshop

1. "The Frontiers of Nuclear and Particle Physics" conducted during 19- 20 March, 2012 at Department of Physics, Aligarh Muslim University (AMU), Aligarh, Uttar Pradesh.
2. "Superstructure and R- Matrix Codes" and course on " Atomic and Molecular Radiation Physics: Astronomy to Biomedicine" conducted during 10 February- 5 March, 2014 at Department of Physics and Astrophysics, University of Delhi (DU) , Delhi.
3. "Low Energy Ion Beam Facility (LEIBF)" conducted during 3- 4 November, 2015 at Inter University Accelerator Centre (IUAC), New Delhi.

Course Attended/ Seminar/ Visitors Programme

1. Course attended on "Ph.D. Teaching Program (Semester-I)" conducted during (August- December 2013) at Inter University Accelerator Centre (IUAC), New Delhi.
2. Course attended on "Ph.D. Teaching Program (Semester-II)" conducted during (January- May 2015) at Inter University Accelerator Centre (IUAC), New Delhi.
3. Course attended on "English Language Proficiency Course (ELPC)" conducted during July- Sep, 2016 at Department of Adult, Continuing Education & Extension, University of Delhi, Delhi.
4. Seminar on "Recent Advances in Atomic & Molecular" conducted during 19 th September, 2017 at Deen Dayal Upadhyaya College, University of Delhi, Delhi.
5. Seminar on "Visitors Programme" conducted during 27 th March, 2017 at Department of Physics and Astrophysics, University of Delhi, Delhi.

Volunteer

1. "Centenary Celebrations" conducted during 21 st March, 2012 at Department of Physics, Aligarh Muslim University (AMU), Aligarh, Uttar Pradesh.

Prizes/ Achievements

1. "Lodhi Kshatriy Ekta Manch" conducted during July, 2007 at Dibai, Bulandshahar, Uttar Pradesh.

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- Awarded third prize for 100 meter race on “Sports Day” held in April 6, 2023 organized by sports committee of the college.
- Co-Convener for the lecture on ‘Exploring Research Possibilities With Atoms and Molecules’ held in March 29, 2023 organised by the QUBIT (Physics Society) in Collaboration with Astronomy Club.
- Co-Convener for the quiz competition on ‘ G-20’ held in March 29, 2023 organised by the QUBIT (Physics Society) in Collaboration with Astronomy Club.
- Convener for the quiz competition on ‘ Astrophysics’ held in March 29, 2023 organised by the Astronomy Club.
- Convener for the a competition on ‘Documentary on Astronomy’ held in March 29, 2023 organised by the Astronomy Club.
- Attended workshop on ‘Managing Conflicts and Teamwork for Healthy Work Environment’ held in March 17, 2023 by NEP 2020 Task Force of the BCAS college.
- Participated as member in workshop on ‘Managing Conflicts and Teamwork for Healthy Work Environment’ held in March 17, 2023 by NEP 2020 Task Force of the BCAS college.
- Participated as Faculty member in Celebration on ‘Science Day’ held in February 28, 2023 by IUAC, Delhi.
- Attended workshop on ‘Online Banking with Cyber Safety’ held in November 11, 2022 delivered by Mr. Rajinder Kumar Dhingra (Regional Manager, State Bank of India).
- Participated as Faculty member in Celebration on ‘Open Day’ held in September 28, 2022 by NPL, Delhi.
- Coordinator for the event on ‘Virtual Lab Visit ’ held in July 01, 2022 organised by the Department of Physics of BCAS.

Personal Details

Date of Birth: 3 June 1988, Gender: Male and Marital Status: Single

Category: Other Backward Class (OBC), Caste: Lodhi Rajput, and Citizenship: India

Hobbies: Learning, Teaching, Planting (Organic Farming), Swimming and Reading Physics Magazine

Permanent Address: Village- Ghusrana Hari Singh, Post- Dibai, District- Bulandshahar, State- Uttar Pradesh, Pin code- 202393, and India.

Signature