Dr. Alok Kumar Singh Jha
Assistant Professor (Physics)
Centre/School/Special Centre: School of Physical Sciences
Room No.: 216 (Lab# 233)
Office Phone: +91-11-26738110 Residence: +91-9811236207
Email: alokksjha@mail.jnu.ac.in
Webpage: https://jnu.ac.in

Qualifications

Ph. D. (2007) Relativistic Calculations of Photoionization Cross Sections in Multielectron Atomic system, Department of Physics and Astrophysics, University of Delhi, Delhi-110007

M. Sc. (2002) Physics, University of Delhi, Delhi-110007

Areas of Interest/Specialization

Atomic structure calculations: Relativistic Structure Calculations of Atoms and Highly charged Ions.

Study of Photon/electron atom/Ion interactions: Photo-ionization Cross Section, Electron Impact Excitation Collision strength calculations of complex Atoms and Ions.

Atomic processes in Plasma: Influence of strongly coupled plasma environment on atomic structure, Photo-ionization Cross Section, Electron Impact Excitation Collision strength calculations of complex Atoms and Ions.

Laser atom interaction: Above threshold ionization(ATI) and High Harmonic generations(HHG) in plasma environment.

Experience

Assistant Professor (Physics) - School of Physical Sciences, JNU (Since November 2020)

Assistant Professor (Physics) – Kirori Mal College, University of Delhi, Delhi (2009 – 2020)

Assistant Professor (Physics) – Ramjas College, University of Delhi, Delhi (2007 - 2008)

Member: American Physical Society, The Global Network for the Atomic and Molecular Physics of Plasmas (GNAMPP).

Current Development in Atomic Molecular Nano and optical Physics, CDAMNOP.

Teaching Area:

M.Sc: Quantum Field Theory, Computational Physics.

B.Sc(H): Atomic and Molecular Physics,Quantum Mechanics, Solid State Physics, Electronic Devices, Statistical Physics, Electromagnetic Theory, Mathematical Physics, Classical Mechanics, Thermal Physics , Optics.

Research Project: Study of Plasma-Embedded Highly Charged Ions under the influence of External Magnetic and Electric fields, Core Research Grant, Science and Engineering Research Board (SERB),DST, 2023-2026.

Ph.D. Students: Guiding Four doctoral Students.

M.Sc Project: Guided Six Master's students.

Involvement in the University Students related activities / research activities: M.Sc. Computer Lab of School of Physical Sciences(SPS), Journal Club (SPS), Adviser(M.Sc.) SPS, Jawaharlal Nehru University.

Publications

43.Effect of Strongly Coupled Plasma and External Electric Field on Electronic Structures and Spectra Properties of C^{5+} and C^{4+}; Narendra Kumar, Shivankar, Alok Kumar Singh Jha , Man Mohan (Communicated).

42. Effect of dense plasma environment and external magnetic field on atomic structure and radiative properties Ar XVII Shivankar, Narendra Kumar, Alok Kumar Singh Jha, Mayank Dimri, Man Mohan(Communicated).

41. Plasma-screening effects on high harmonic generation and photoelectron spectra of the hydrogen atom using femtosecond laser, Asish Kumar, Alok K S Jha, M.Mohan (Communicated).
40. Relativistic atomic structure calculations, plasma and thermodynamic parameters for Ca X Narendra Kumar, Shivankar,Alok Kumar Singh Jha , Mayank Dimri, Dishu Dawra, Man Mohan (Accepted for publication in The European Physical Journal Plus)
39. A Study of the Atomic Processes of Highly Charged Ions Embedded in Dense Plasma, Review article A.K.S. Jha; .Dimri; D.Dawra ;M. Mohan. Atoms 2023, 11, 158.
38. AboveThreshold Ionization spectra for Debye plasma embedded atom interacting with femtosecond laser pulse P Kumar, R Joshi, Alok K S Jha,and M Moahn ,Spectroscopy Letters, VOL. 56, NO. 4, 194–203, 2023.
37. Study of SXR and HXR transitions with intensity spectra of W LXIX Richa Paijwar; Rinku Sharma; Alok Kumar Singh Jha, Eur. Phys. J. Plus ,138:460,2023.
36. Photoionization of Na-like Si IV using R-matrix method, N.Verma, Alok K S Jha, D Dawra, M. Dimri, M Mohan Eur. Phys. J. D 77 :134,2023.
35. Study of electron impact excitation of H-like Si13+ ion in dense plasma environment Jagjit Singh, D. Dawra, N.Verma , Alok K.S. Jha, P. Kumar, M. Dimri, M. Mohan, New Astronomy 101,2023,102001,2023.
34. Relativistic atomic structure calculations of KIX with plasma parameters Richa Paijwar, R Sharma and Alok K S Jha, Physics of Plasmas **29**, 092702 (2022)
33. Theoretical calculations of the photoionization cross sections for the ground and lowest two excited states of Ni XVIII ion D. Dawra ,M Dimri, A. K. Singh, Alok K. S. Jha , R K Pandey and Man Mohan, Eur. Phys. J. D, 76:59, 2022.
32. Influence of strongly coupled plasma on the low-lying transitions of Be-like ions M. Dimri, D. Dawra, A.K.Singh, R.K.Pandey, Alok K S Jha, P. Kumar,and M.Mohan, Eur. Phys. J. D, 76,11, 2022.
31. Electron impact excitation of Na-like Cu XIX using the Breit–Pauli R-matrix method M. Dimri, D. Dawra , A. K. Singh, Alok K. S. Jha , R. K. Pandey , R.Sharma ,and M Mohan,Eur. Phys. J. D 75,157,2021.
30. Influence of strong coupled plasma environment on photoionization of H-like O^{7+} ion D. Dawra, M. Dimri, A.K.Singh, Alok K S Jha, R.K.Pandey, R. Sharma and M.Mohan, Physics of Plasma 28,112706,2021.
29. Fine struvture calculations of excitation energies, lifetimes and radiative properties od S-like Kr-XXI M. Dimri, D. Dawra, A.K.Singh, Alok K S Jha, R.K.Pandey, R. Sharma and M.Mohan, Radiation Physics and Chemistry,189,109756,2021.
28. Electron impact excitation of Na-like Cu XIX using the Breit–Pauli R-matrix method M. Dimri, D. Dawra, A. K. Singh, Alok K S Jha, R. K. Pandey, R. Sharma and M. Mohan Eur. Phys. J. D, 75: 157,2021.
27. Atomic structure and radiative properties of He-like Ni $^{26+}$ ion in dense plasma M. Dimri, D. Dawra, A.K.Singh, Alok K S Jha, R.K.Pandey, M.Mohan, Can. J. Phys. 99, 559-565,2021.
26. Plasma screening effects on the atomic structure of He-like ion embedded in strongly coupled plasma A K Singh, D. Dawra; M. Dimri; Alok K.S. Jha; R.K.Pandey, M. Mohan Physics Letter A,384, 12,126369,2020.
25. Relativistic Photoionization cross section calculation and resonance parameters of Mg-like Se XXIII A K Singh, D. Dawra; M. Dimri; Alok K.S. Jha; R Sharma, M. Mohan, Radiation Physics and Chemistry 168, 108447,2020.
24 Relativistic atomic structure calculations and study of plasma parameter for Na-like Se XXIV A K Singh, D. Dawra; M. Dimri; Alok K.S. Jha;and M. Mohan, Physics of Plasma 26 (6),062704, 2019
23 Relativistic R-matrix photoionization cross section calculations of Ne-like Co XVIII with resonance parameters A K Singh, M. Dimri; D. Dawra, Alok K S Jha, M.Mohan, J.Phys.B: At. Mol .Opt. Phys. **52** (7) 075002., 2019.
22 Relativistic R-matrix calculations of photoionization cross sections of Cu XVIII A K Singh, M. Dimri, D. Dawra , Alok K S Jha and M Mohan The European Physical Journal D 73(5) 85,2019
21 Spectroscopic study of EUV and SXR transitions of Cu XIX with plasma parameters A.K. Singh, M. Dimri, D. Dawra, Alok K.S. Jha, N. Verma , M. Mohan Radiation physics and Chemistry,156, 174-192,2019.
20 Accurate study on the properties of spectral lines for Na-like Cr^{13+} A.K. Singh, M. Dimri; , D. Dawra, Alok K S Jha, M. Mohan ,Can. journal of Physics,97: 436–442 2019
19. Relativistic atomic data for W XLVII S. Aggarwal, Alok K S Jha, I Khatri, N Singh and M. Mohan Chinese Phys B 24(5) 0532201,2015
18. Reply to comment on Multiconfigurational Dirac-fock energy levels and radiative rates for Br- likeTungsten, M Mohan, S Aggarwal, N Singh and Alok K S Jha, Can J Phys 92 (6) 551-552,2014
17. Energy Level and Radiative Rates for Transition in Ge XXXI, As XXXII and Se XXXIII S. Aggarwal, J.Singh, Alok K S Jha, M. Mohan At. Data Nucl. Data Tables,**100**, 859,2014
16. Multiconfigurational Dirac-fock energy levels and radiative rates for Br-likeTungsten, S. Aggarwal, Alok K.S.Jha and M.Mohan, Can. Journal of Physics91(5),394-400,2013.
15. Photoionization Cross-Section of Chlorine-likeIron,

S. Aggarwal, J. Singh,Alok K.S.Jha and M.Mohan, Journal of Astrophysics and Astronomy, **33,**291–301,2012.

14. Photoionization of Al-like silicon using R-matrix method,
J.Singh, S Aggrawal, Alok K.S.Jha ,A K Singh and M.Mohan, Canadian Jouranl of Physics 89(11),1119 -1126, 2011

13. Lifetime for TiX spectrum,
J.singh, Alok K.S.Jha, M.Mohan, Journal Phys. B. At. Mol. Opt. Phys 43 (11), 115005, 2010.

12. Relativistic R-matrix close-coupling calculations for Silicon-like NiXV,
J. Singh, Alok K.S.Jha, M.Mohan, Astrophysical Journal Supplement series,186,334-340,2010.

11. New Atomic Data for Ti X,
J. Singh, Alok K.S.Jha, N.Verma, M.Mohan , At.Data Nucl.Data Tables 96,759,2010.

10. Photoionization cross section for NiXIX,
Alok K S Jha, S.Tyagi and M. Mohan, The Astrophysical Journal supplement Series, 173,177, 2007.

9. Electron collisional excitation of argon-like Ni XI using the Breit-Pauli R-matrix method
N. Verma, Alok K. S. Jha and M. Mohan, The European Physical Journal D 42, 235- 241,2007,

8. Level energies, oscillator strengths and lifetimes for transitions in TiVI
M. Mohan, A.K.Singh , Alok K.S.Jha and P. Jha,At. Data Nucl. Data Tables, 93(1), 105- 126, 2007.

7. New relativistic atomic data of Fe IX
N. Verma, Alok K S Jha and M Mohan, Astrophysical Journal Supplement series 164, 297 2006.

6. Photoionisation of ground $1s^2 2s^2 2p^6\ ^1S^e$ and excited $1s^2 2s^2 2p^5 3s^3\ P^o_{0,1,2}$ states of Si V using relativistic Briet Pauli R-matrix method,
Alok K S Jha**,**N. Singh, N Verma and M. Mohan, Canadian Journal Phys.,84,707,2006.

5. Relativistic R-matrix close-coupling calculations for Photoionization of Ne-like Al IV,
Alok K. S. Jha, P.Jha, S. Tyagi and M. Mohan, Eur. Phys. J. D, 39,391,2006.

4. Semi-relativistic Calculations for the Photoionization of Neutral Argon from its Four Lowest J-States,
M.Mohan ,Alok.K.S. Jha& N.Singh , Physica Scripta73(6) , 601 2006.

3. Breit-Pauli energy levels and radiative lifetimes in neutral chlorine,
N. Singh, Alok K S Jha and Man Mohan, Eur. Phys J. D 38(2), 285 2006.

2**.** Transition in Co XI,
N. Verma, Alok K. S. Jha and M. Mohan, J. Phys. B: At. Mol. Opt. Phys38, 3185,2005.

1. Fines- structure energy levels, oscillator strengths and lifetimes of Chlorine like chromium,
M.Mohan, A.K.Singh, Alok.K.S.Jha and N. Singh Pramana journal of physics 65 75 July 2005.

Chapter in books

2.Influence of Dense Plasma Environment on the He-α and He-β Transitions of Cl^{15+} Ion
Proceedings of the International Conference on Atomic, Molecular, Optical & Nano Physics with Applications (pp.85-104),January 2022 DOI :10.1007/978-981-16-7691-8_8.

1. Photoionization Cross section for complex multi electron Ions, S Tyagi, A K Singh, Alok K S Jha and M Mohan Atomic structure and collision processes Narosa Publishing House (2009),ISSN978-81–7319- 811-3.

Invited Talk/Speaker

Invited speaker in the academic event “NEWTONIAN” Kirori Mal College, University of Delhi, March 23, 2023.

International Seminar on the topic “Atomic Process, Laser, Nano material and Terahertz Technology for Optical Fiber Communication (LNTOFC-22)” 9-10 th February 2023,M.L.S College,L.N.M.University, Bihar.

Conference / Workshops/Training Organized/Member

7.Two days National Topical Conference on Chandra’s contribution in Plasma Astrophysics, October 19- 20,2021, SPS, Jawaharlal Nehru University, New Delhi.

6. Online course on “Basics of High Performance Computing” conducted jointly by SPS, JNU and C-DAC under the aegis of National Super computing Mission, 19-30 April 2021.

5. Member of Organizing Committee "International Conference on Atomic, Molecular, Optical and Nano Physics with Applications"(**CDAMOP**), held at Delhi Technological University, December 18- 20,2019

4. Member of Organizing Committee "International Conference on Atomic, Molecular, Optical and Nano Physics with Applications"(**CDAMOP**), held at University of Delhi -110 007, March 11-14, 2015

3. Member of Organizing Committee "International Conference on Atomic, Molecular, Optical and Nano Physics with Applications"(**CDAMOP**), held at University of Delhi -110 007, December 14-16, 2011

2. Member of Organizing Committee "International Conference on Atomic, Molecular and Optical Physics with Applications"(**CDAMOP**), held at University of Delhi, Delhi-110 007, India (March 21- 23, 2006)

1. Member of Organizing Committee "International Conference on Atomic, Molecular and Chemical Physics with Applications"(**CDAMCP**), held at University of Delhi-110007, India (March 20-22,2002).

Conference/Workshops/Training attended/Paper Presented

19. Relativistic Atomic Structure Calculations of Ca X with Plasma Parameters
Narendra Kumar, Shivankar, Man Mohan and Alok Kumar Singh Jha,- 23rdNational Conference on Atomic and Molecular Physics (NCAMP 2023) 20 - 23 February,2023.

18. High Harmonic Generation & Photoelectron Spectra of Plasma Embedded Hydrogen Atom in Femtosecond Laser
Ashish Sharma, Man Mohan and Alok Kumar Sing Jha, 23rdNational Conference on Atomic and Molecular Physics (NCAMP 2023), 20 - 23 February,2023.

17. Configuration Interaction Effect on Shannon Entropy in Ne like Ions
Shivankar, Narendra Kumar, Man Mohan and Alok Kumar Singh Jha, 23rdNational Conference on Atomic and Molecular Physics (NCAMP 2023), 20 - 23 feb. 2023.

16. Plasma shielding effect on hydrogen atom in intense laser field.
Ashish Sharma, Alok Kumar Singh Jha, Man Mohan, Serial No. 41, Abstract Id. 346, Poster No. LP-41 ,37th National Symposium on Plasma Science & Technology (Plasma-2022),December 12-14, 2022.

15. Research based course “Atomic Astrophysics and Spectroscopy with Computational workshops on the SUPERSTRUCTURE and the R-matrix codes, Platform: zoom, Global Participation, Support: OSU- USA, OSC-USA, AMU-India, October 16 – 31, 2021

14. Energy Levels and Radiative Data of Na-Like W Useful in Astrophysical Plasma (Poster Id-P07)
20-22 June-20222 nd International conference on plasma theory and simulation(online), Department of Physics, University of Lucknow, India

13. 4thInternational Conference on Current development in Atomic, Molecular, Optical and Nano-Physics with Applications"(**CDAMOP**), held at University of Delhi -110 007, March 11-14,2015

12.3rdInternational Conference on Current developments in Atomic, Molecular, Optical and Nano-Physics with Applications"(**CDAMOP**), held at University of Delhi -110 007, December 14-16,2011

11.DAE-BRNS SAMOP, Inter University Accelerator Centre, Delhi,Feb,2009.

10.Relativistic photoionization cross section for Neon like nickel
Alok k. S. Jha, S. Tyagi and Man Mohan. XVI National Conference on Atomic and Molecular Physics, P1/42, Tata Institute of Fundamental Research, Mumbai, January, 08 – 11,2007.

9. Photoionization of Ground and Lowest Three Excited States of Si V using relativistic R-matrix method
Alok K S Jha, N. Singh, N. Verma and Man Mohan. Page 179, 2nd Internationalconference on 'Current Developments in Atomic, Molecular and Optical Physics with Application' (**CDAMOP**), University of Delhi, India March 21 23,2006.

8. Forbidden and allowed transitions in chlorine like Ti VI, XV National conference on Atomic and Molecular Physics NCAMP, Physics Research Laboratory (PRL), Navarangpura, Ahmedabad, December 20-23,2004.

7. National Conference on Engineering Optics & Spectroscopy C C S University Meerut, India (April 5- 7, 2004).

6. Scientific Workshop in the Fields of: Plant Biochemistry and Biotechnology, Nanotechnology, Molecular Biology of Infectious Diseases, IIT Delhi, India, (October 28 -29,2004).

5. Thirteenth National Seminar on Ferroelectrics and Dielectrics (NSFD-XIII), Department of Physics and Astrophysics, University of Delhi, Delhi, (November23-25, 2004).

4. Participated in SERC school on Precision Spectroscopy of atoms, molecules and Bose condensates, Indian Institute of Science, (IISc) Bangalore, India (Feb-March 2003).

3. National conference on Atomic and Molecular Physics NCAMP, Department of Physics, BRA Bihar University, Muzaffarpur, India (December 3-5,2003).
2. XIV National conference on Atomic and Molecular Physics NCAMP, Visva-Bharti, Shantiniketan,West Bengal January 28-February 1,2003, India
1. International conference on 'Current Developments in Atomic, Molecular and Chemical Physics with Application' (CDAMCP), University of Delhi, India (March 20-22, 2002)