



DR. TAPAS KUMAR GHOSH

Present position: Associate Professor
Department of Physics, DHWU

Personal contact: Phone : +91 9903073356
E-mail: tapaskrg@yahoo.com

Academic qualifications:

- B.Sc. - University of Calcutta, India
- M.Sc. - Visva Bharati, India
- Ph.D. - Jadavpur University, India
(Res. Inst.- Indian Association for the Cultivation of Science, India)

Post-doctoral experience:

- 1996-1997 Indian Association for the Cultivation of Science, Jadavpur, India
- 1997-1998 University of Electro-Communications, Tokyo, Japan
- 1998-2000 Institute for Molecular Sciences, Okazaki, Japan
- 2000-2001 Keio University, Yokohama, Japan
- 2002-2002 University of Calcutta, Kolkata, India

Positions held:

| <u>University/Institution</u> | <u>Period</u> | <u>Position</u> |
|---|---------------|-------------------------------------|
| University of Electro-Communications Dept. of Natural Sciences, Tokyo, Japan | 1997-1998 | Lecturer |
| Institute for Molecular Sciences Molecular Cluster Division, Okazaki, Japan | 1998-2000 | Lecturer (IMS Fellow) |
| Keio University Dept. of Chemistry, Yokohama, Japan | 2000-2001 | Instructor/Lecturer (JST Fellow) |
| Dr. B. C. Roy Engineering College, Dept. of Physics, Durgapur, India | 2002-2007 | Lecturer & HOD |
| Ramakrishna Mission Residential College Narendrapur, Kolkata, India | 2007-2016 | Assistant Professor |
| Diamond Harbour Women's University, Sarisha, Diamond Harbour, India | 2016-To date | Associate Professor |

Area of research interests: **Theoretical Study of Atoms, Molecules & Clusters**

Present research interest includes the investigation of molecules containing halogens, carbon-dioxide etc. which are potentially important in atmospheric ozone depletion, particularly in the lower stratosphere. Ab initio methods are used to study their spectroscopic properties, thermo-chemistry, reaction kinetics and their effectiveness in atmospheric ozone depletion.

Quantum chemical calculations of the response properties of atoms and molecules of astrophysical interests also share a part of my research work.

Research project completed/ongoing:

Minor Research Project funded by UGC: 2008-2010

Life Member of Academic Society:

Indian Physical Society

Indian Association of Physics Teachers

Indian Society of Atomic & Molecular Physics

Participation in:

National Conferences, Seminars, Workshops, Teacher's enrichment program etc.- 42, International conferences- 10

Publications :

(A) Atomic Calculations:

1. Dynamic polarizabilities & Rydberg states of argon isoelectronic sequence
- **T.K. Ghosh**, A.K. Das, Marcos Castro, S. Canuto and P.K. Mukherjee
Physical Review **A48**, 2686 (1993).
2. Quadrupolar transition probabilities for open shell atomic systems
- **T.K. Ghosh**, A.K. Das and P.K. Mukherjee
The Astrophysical Journal **419**, 855 (1993).
3. New resonances in a dynamic polarizability calculation
- **T.K. Ghosh**, A.K. Das and P.K. Mukherjee
Chemical Physics Letters **218**, 433 (1994).
4. Static quadrupole polarizabilities of negative ions
- A.K. Das, **T.K. Ghosh** and P.K. Mukherjee
Physica Scripta **50**, 354 (1994).
5. Doubly excited 3S_e , 3D_e and 3G_e states of two-electron atomic systems
- A.K. Das, **T.K. Ghosh** and P.K. Mukherjee
Theoretica Chimica Acta **89**, 147 (1994).
6. On the interpretation of two electron-one photon transitions in slow collisions between fully stripped ions and solid targets
- T.K. Mukherjee, **T.K. Ghosh** and P.K. Mukherjee
Zeitschrift fur Physik D **33**, 7 (1995).

7. Oscillator strengths for highly stripped ions of C- isoelectronic sequence
- **T.K. Ghosh**, D. Ray and P.K. Mukherjee
Canadian Journal of Physics **73**, 554 (1995).
8. The $2p^5 3l$ configurations of highly stripped Ne-like ions: Possibility of X-ray laser emission
- **T.K. Ghosh**, A.K. Das, T.K. Mukherjee and P.K. Mukherjee
The Astrophysical Journal **452**, 949 (1995).
9. Atomic data of medium Z ions
- **T.K. Ghosh** and P.K. Mukherjee
Physica Scripta **55**, 273 (1997).
10. Quadrupolar transitions in chlorine isoelectronic ions
- A.K. Das, **T.K. Ghosh**, D. Ray, T.K. Mukherjee and P.K. Mukherjee
Physica Scripta **58**, 315 (1998).
11. Inter-configuration forbidden transitions in argon isoelectronic ions
- A.K. Das, **T.K. Ghosh**, D. Ray, T.K. Mukherjee and P.K. Mukherjee
The Astrophysical Journal **508**, 959(1998).
12. Radial and angular correlations in doubly excited states: a time-dependent perturb. approach
- A.K. Das, **T.K. Ghosh**, D. Ray, T.K. Mukherjee and P.K. Mukherjee
Int. J. Quantum Chem. **76**, 99 (1999).

(B) Molecular Calculations:

13. Theoretical study of the spectroscopic constants of low lying states of Ga_2
- **T.K. Ghosh**, K. Tanaka and Y. Mochizuki
J. Mol. Struct. (Theochem) **451**, 61 (1998).
14. The CSF based multi-referenced coupled pair approximation IV- Revision of coupling term and application to Rydberg-valence avoided crossing in the lowest two $^1\Sigma^+$ excited states of the FH molecule and lowest two $^3\Sigma_g$ states of F_2 molecule.
- K. Tanaka, **T. K. Ghosh** and T. Sakai
Int. J. Quan Chem. **74**, 661 (1999).
15. Ab initio CASSCF and MRSDCI calculations of the $(C_6H_6)_3^+$ radical.
- E. Miyoshi and **T. K. Ghosh**
Chem. Phys. Lett, 323, **434** (2000).
16. Molecular Orbital study on the OH stretching freq. of the phenol dimer and its cation.
- **T.K. Ghosh** and E. Miyoshi
Theo. Chem. Acc, **105**, 31 (2000).
17. Electron emission in collisions between atoms and dressed projectiles.
-A. Mondal, **T.K. Ghosh**, C.R. Mandal, and M. Purkait
J. Phys. B: At & Mol Phys. **49**, 245203 (2016).
18. Ab initio study of the reaction kinetics of $IO+ClO$ and $IO + BrO$.
-**T.K. Ghosh** and S. Yabushita
Int. J. Res. Chem. Envir. **7**, 7 (2017).

19. Ab initio study of the IOOCl isomers and reaction pathways of IO+ClO reaction.
-**T.K. Ghosh** and S. Yabushita
Int. J. Res. Chem. Envir. **3**, 1 (2018).
20. Theoretical study of the spectroscopic constants of the van der Waals complex ArHF and a possibility of fluorine anion from an excited state.
-**T.K. Ghosh** , E. Miyoshi and K Tanaka
Int. J. Res. Chem. Envir. **3**, 17 (2018).

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***** **Thank you.** *****