Dr Sandip Ghosh

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Address: Patna , Bihar , India - 803302
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AREAS OF EXPERTISE

Physical Chemistry

Theoretical and Computational Chemistry, Attosecond Chemistry, Quantum Reactive Scattering, Reaction Dynamics

EDUCATION

Ph.D. *2019*

Indian Association for the Cultivation of Science (Degree Awarded by the "University of Calcutta")"

M.Sc. *2012*

Indian Institute of Technology Kanpur

B.Sc. (Hons.) *2010*

University of Calcutta

PROFESSIONAL EXPERIENCE

Patliputra University, Patna *2025 - Present*

Assistant Professor

Patna

Indian Institute of Science Education and Research, Kolkata *2025 - 2025*

Visiting Fellow

Nadia

Indian Institute of Science Education and Research, Kolkata *2022 - 2024*

Post-Doctoral Fellow

Nadia

Indian Institute of Science Education and Research, Kolkata *2021 - 2022*

Post-Doctoral Research Associate

Nadia

Indian Association for the Cultivation of Science *2019 - 2021*

Post-Doctoral Research Associate

Kolkata

RESEARCH PROJECTS

Attosecond dynamics in multi-electron molecular systems: Controlling the chemical processes at its most fundamental level

Role: Principal Investigator (NPDF)

Year: 2022 | Amount: 2868800

HONOURS AND AWARDS

National Post-doctoral Fellwoship *2022*

Awarded by: ANRF and SERB, India

AIR 35 in NET *2012*

Awarded by: CSIR-UGC

AIR 11 in JAM-2010 *2010*

Awarded by: IIT Madras

13th Rank (Jt.) in B.Sc. (Chemistry Hons.) *2010*

Awarded by: University of Calcutta

COMMITTEE MEMBERSHIPS

NAAC *2026*

Coordinator

IQAC *2026*

Coordinator

DCF *2026*

Coordinator

RTI Officer *2026*

In-Charge

PUBLICATIONS

1. **Two-Dimensional Confinement Effects on the Dynamical Aspects of CO Oxidation over Pt(111)**

   Nidhi Tiwari, Sandip Ghosh and Ashwani K. Tiwari

Journal of Physical Chemistry C , Vol. 129 (2025) , pp. 1988-1999

2. **Mode-Selective H2O Dissociation on Pt(111) under Two-Dimensional Confinement**
   Nidhi Tiwari and Sandip Ghosh and Ashwani K. Tiwari
   Phys. Chem. Chem. Phys. , Vol. 28 (2025) , pp. 155-173 [*Joint First Author]

3. **Quasi-Classical Trajectory Calculations on a Two-State Potential Energy Surface Including Nonadiabatic Coupling Terms as Friction for D+ + H2 Collisions**
   Mukherjee S.; Saha S.; Sandip Ghosh; Adhikari S.; Sathyamurthy N.;Baer M.
   Journal of Physical Chemistry A , Vol. 128 (2024) , pp. 7691-7702

4. **Coupled 3D (J ≥ 0) Time-Dependent Wave Packet Calculation for the F + H2 Reaction on Accurate Ab Initio Multi-State Diabatic Potential Energy Surfaces**
   Naskar K.;Mukherjee S.;Sandip Ghosh; Adhikari S.
   Journal of Physical Chemistry A , Vol. 128 (2024) , pp. 1438-1456

5. **Effficient Control of Electron Localization and Probability Modulation with Synthesized Two Color Intense Laser Pulses**
   Sandip Ghosh and G. Pandey and A. K. Tiwari
   J. Phys. Chem. A , Vol. 128 (2024) , pp. 6423-6439

6. **Strong Laser Field-Driven Coupled Electron–Nuclear Dynamics: Quantum vs Classical Description**
   G. Pandey and Sandip Ghosh and A. K. Tiwari*
   J. Phys. Chem. A , Vol. 127 (2023) , pp. 9206-9219 [*Joint First Author]

7. **Coupled three-dimensional quantum mechanical wave packet study of proton transfer in H2+ + He collisions on accurate ab initio two-state diabatic potential energy surfaces**
   Naskar K.;Sandip Ghosh;Adhikari S.;Baer M.;Sathyamurthy N.
   Journal of Chemical Physics , Vol. 159 (2023) , pp. 034302

8. **Accurate Calculation of Rate Constant and Isotope Effect for F+H2 Reaction by Coupled 3D Time-dependent Wave Packet Method on the Newly Constructed ab initio Ground Potential Energy Surface**
   Koushik Naskar and Sandip Ghosh and S. Adhikari
   J. Phys. Chem. A , Vol. 126 (2022) , pp. 3311

9. **Dissociative ionization of H2 molecule under strong elliptically polarized laser field: Carrier-envelope phase and orientation effect**
   G. Pandey and Sandip Ghosh and A. K. Tiwari
   Phys. Chem. Chem. Phys. , Vol. 24 (2022) , pp. 24582

10. **Trajectory surface hopping vs. quantum scattering calculations on D+ + H2 and H + H2+ reactions using ab initio surfaces and couplings**
    Mukherjee S.;Hazra S.;Sandip Ghosh;Mukherjee S.;Adhikari S.
    Chemical Physics , Vol. 560 (2022) , pp. 111588

11. **Dynamical calculations of O(3P) + OH(2Π) reaction on the CHIPR potential energy surface using the fully coupled time-dependent wave-packet approach in hyperspherical coordinates**
    Sandip Ghosh;Sharma R.;Adhikari S.; A. J. C. Varandas
    Physical Chemistry Chemical Physics , Vol. 23 (2021) , pp. 21784-21796

12. **Charge Transfer Processes for H + H 2+Reaction Employing Coupled 3D Wavepacket**

Approach on beyond Born-Oppenheimer Based Ab Initio Constructed Diabatic Potential Energy Surfaces

Sandip Ghosh;Sahoo T.;Baer M.;Adhikari S.
Journal of Physical Chemistry A , Vol. 125 (2021) , pp. 731-745

13. **The role of electron-nuclear coupling on multi-state photoelectron spectra, scattering processes and phase transitions**

    Dutta J.;Mukherjee S.;Naskar K.;Sandip Ghosh;Mukherjee B.;Ravi S.;Adhikari S.
    Physical Chemistry Chemical Physics , Vol. 22 (2020) , pp. 27496-27524

14. **Beyond Born–Oppenheimer theory for spectroscopic and scattering processes**

    Mukherjee B.;Naskar K.;Mukherjee S.;Sandip Ghosh;Sahoo T.;Adhikari S.
    International Reviews in Physical Chemistry , Vol. 38 (2019) , pp. 287-341

15. **Fully coupled (: J > 0) time-dependent wave-packet calculations using hyperspherical coordinates for the H + O2 reaction on the CHIPR potential energy surface**

    Sandip Ghosh; Sharma R.;Adhikari S.; A. J. C. Varandas
    Physical Chemistry Chemical Physics , Vol. 21 (2019) , pp. 20166-20176

16. **Beyond Born-Oppenheimer treatment on spectroscopic and scattering processes**

    B. Mukherjee, Sandip Ghosh, S. Adhikari
    Journal of Physics Conference Series , Vol. 1148 (2018) , pp. 012001

17. **The TDDVR approach for molecular photoexcitation, molecule–surface and triatomic reactive scattering processes**

    Mandal S.; Sandip Ghosh; Sardar S.;Adhikari S.
    International Reviews in Physical Chemistry , Vol. 37 (2018) , pp. 607-700

18. **Beyond Born-Oppenheimer theory for ab initio constructed diabatic potential energy surfaces of singlet H 3 + to study reaction dynamics using coupled 3D time-dependent wave-packet approach**

    Sandip Ghosh; Mukherjee S.;Mukherjee B.;Mandal S.;Sharma R.;Chaudhury P.;Adhikari S.
    Journal of Chemical Physics , Vol. 147 (2017) , pp. 074105

19. **3D time-dependent wave-packet approach in hyperspherical coordinates for the H + O2 reaction on the CHIPR and DMBE IV potential energy surfaces**

    Sandip Ghosh;Sharma R.;Adhikari S.; A. J. C. Varandas
    Physical Chemistry Chemical Physics , Vol. 20 (2017) , pp. 478-488

20. **Coupled 3D Time-Dependent Quantum Wave-Packet Study of the O+OH Reaction in Hyperspherical Coordinates on the CHIPR Potential Energy Surface**

    Sandip Ghosh, R. Sharma, S. Adhikari and A. J. C. Varandas
    Chem. Phys. Lett. , Vol. 675 (2017) , pp. 85-91

21. **Coupled 3D time-dependent wave-packet approach in hyperspherical coordinates: The D+ + H2 reaction on the triple-sheeted DMBE potential energy surface**

    Sandip Ghosh, T. Sahoo, S. Adhikari, R. Sharma and A. J. C. Varandas
    The Journal of Physical Chemistry A , Vol. 119 (2015) , pp. 12392-12403

22. **The effect of surface temperature on D2 (v0 j0) - Cu(111) system in polar coordinates**

    S. Mandal and T. Sahoo and Sandip Ghosh and S. Adhikari
    J. Ind. Chem. Soc. , Vol. 92 (2015) , pp. 291

23. **The effect of surface temperature on H2/D2 (v 0 j 0) - Ni (100) scattering processes**

S. Mandal and T. Sahoo and Sandip Ghosh and S. Adhikari
Molec. Phys. , Vol. 113 (2015) , pp. 3042

24. **The effect of phonon modes and electron-hole pair couplings on molecule-surface scattering processes**
Mandal S.;Sahoo T.;Sandip Ghosh;Adhikari S.
Journal of Theoretical and Computational Chemistry , Vol. 14 (2015) , pp. 1550028

25. **Low-temperature D+ + H2 reaction: A time-dependent coupled wave-packet study in hyperspherical coordinates**
T. Sahoo, Sandip Ghosh, S. Adhikari, R. Sharma and A. J. C. Varandas
The Journal of Chemical Physics , Vol. 142 (2015) , pp. 024304

26. **Coupled 3D time-dependent wave-packet approach in hyperspherical coordinates: Application to the adiabatic singlet-State (1 1A') D+ + H2 reaction**
T. Sahoo, Sandip Ghosh, S. Adhikari, R. Sharma and A. J. C. Varandas
The Journal of Physical Chemistry A , Vol. 118 (2014) , pp. 4837--4850

27. **Correction to “Coupled 3D Time-Dependent Wave-Packet Approach in Hyperspherical Coordinates: Application to the Adiabatic Singlet-State (1 1A′) D+ + H2 Reaction”**
T. Sahoo, Sandip Ghosh, S. Adhikari, R. Sharma, and A. J. C. Varandas
J. Phys. Chem. A , Vol. 118 (2014) , pp. 6740