

Bobby Antony

PROFESSOR OF PHYSICS

519 Academic Block, Department of Physics, IIT(ISM) Dhanbad, JH 826004, India

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“Set your course by the stars, not by the lights of every passing ship.” ... O.N. Bradley

Education

SP University / The Open University

Anand, India / Milton Keynes, UK

PH.D. IN PHYSICS

2000-2005

- Received Commonwealth Split-Site Scholarship to UK; Awarded CSIR Senior Research Fellowship.

University of Calicut

Kerala, India

M.Sc. IN PHYSICS

1996-1998

- Top 5% in class with 7.0/10.

Christ College

Kerala, India

B.Sc. IN PHYSICS

1993-1996

- Top 1% in class with 8.8/10.

Research Interest

Electron induced chemistry

23 years of experience

(e^- – atom/molecule interaction)

2000 onwards

- Established computational facility to investigate 0.1 eV – 10 keV electron induced processes.
- Predicts various scattering cross section for atoms and molecules of applied interest.
- Investigates low energy electron scattering from molecules and detects resonances due to electron attachment.

Positron scattering dynamics

6 years of experience

(e^+ – atom/molecule interaction)

2017 onwards

- Designed and implemented positron scattering calculations through quantum mechanical approach.
- Prediction of scattering cross section for positron from many target systems in the energy range of 1 eV to 5 keV.
- Evaluation of positronium formation cross section.

Photoionization studies

4 years of experience

(photon – molecule interaction)

2019 onwards

- Computations of photoionization cross section for molecules.
- Implemented through UK R-matrix method.

Experience

TEACHING

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| 06/2019 | Professor , Indian Institute of Technology (Indian School of Mines), Dhanbad, India | 5 years |
| 07/2011 | Associate Professor , Indian Institute of Technology (Indian School of Mines), Dhanbad, India | 8 years |
| 07/2008 | Assistant Professor , Indian School of Mines, Dhanbad, India | 3 years |
| 08/2007 | Lecturer , Mar Athanasius College, Kerala, India | 1 year |

RESEARCH

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|---------|---|-----------|
| 07/2008 | Professor/Associate Professor/Assistant Professor , IIT(ISM), Dhanbad, India | 16 years |
| 03/2008 | Visiting Fellow , TIFR, Mumbai, India | 0.5 years |
| 02/2005 | Post-doctoral research associate , University of Massachusetts, Lowell, USA | 2.5 years |
| 03/2004 | Senior Research Fellow , CSIR, New Delhi, India | 1 year |
| 01/2003 | Commonwealth Research Scholar , Association of Commonwealth Universities, London, UK | 1 year |
| 10/2002 | Senior Research Scholar , DST, New Delhi, India | 1 year |
| 10/2000 | Junior Research Scholar , DST, New Delhi, India | 2 years |

Awards/Fellowships/Scholarships

8. **University of Kent, UK**, Royal Society International Exchange Award 04/2023 to 03/2025
7. **University of Kent, UK**, ASEM DUO-India Professors Fellowship 06/2022 to 08/2022
6. **TIFR, India**, Visiting Fellow 04/2008 to 06/2008
5. **UMASS Lowell, USA**, Post-doctoral Research Fellow 02/2005 to 05/2007
4. **CSIR, India**, Senior Research Fellowship 04/2004 to 01/2005
3. **ACU, UK**, Commonwealth Scholarship Award 01/2003 to 01/2004
2. **DST, India**, Senior Research Fellowship 10/2002 to 01/2003
1. **DST, India**, Junior Research Fellowship 10/2000 to 09/2002

Projects

6. **SERB**, e^-/e^+ induced chemistry at the molecular level: investigation through scattering studies. 02/2021; ₹2.33Mn
5. **AICTE (Co-PI)**, Implementation of electron scattering cross-section for calculation of plasma.... 02/2021; ₹0.84Mn
4. **ISRO**, e^- induced chemistry of molecules relevant to space applications. 04/2020; ₹2.46Mn
3. **SERB**, Investigation of e^- scattering phenomena in biological & environment sensitive molecules. 05/2017; ₹2.66Mn
2. **UGC**, e^- impact scattering cs for mols. of env. and biological importance: A theoretical study. 02/2014; ₹0.68Mn
1. **DST**, e^- induced collision & ionization of technologically relevant atoms/mols.: A theoretical study. 05/2014; ₹1.19Mn

Publications

RECENT ONES

5. **J. Appl. Phys.**, 136 (2024) 044901. *Impact factor: 2.3*
4. **Rad. Phys. Chem.**, 222 (2024) 111827. *Impact factor: 2.9*
3. **RSC Advances**, 14 (2024) 1397. *Impact factor: 3.9*
2. **J. Phys. Chem. A**, 127 (2023) 10464. *Impact factor: 2.9*
1. **J. Phys. D: Appl. Phys.**, 56 (2023) 134001. *Impact factor: 3.4*

SUMMARY

| SCI Journals | Proceedings/Non-SCI/Reports | Books/Monographs | Invited Talks | Abstracts |
|--------------|-----------------------------|------------------|---------------|-----------|
| 133 | 20 | 6 | 20 | 116 |

For complete list of publications, click the link →

[List of publications](#)

Research Supervision

PH.D. – ONGOING

17. **Mr. Soumyo Kheto**, TBD *Joined: 07/2024*
16. **Mr. Ashutosh Yadav**, TBD *Joined: 08/2023*
15. **Mr. Sudhanshu Arya**, Theoretical investigation of electron and positron scattering dynamics and photoionization processes for molecules *Joined: 08/2022*
14. **Ms. Meenu Pandey**, Theoretical study of electron interaction with Focused Electron Beam Induced Deposition (FEBID) Technique precursors molecules *Joined: 12/2021*
13. **Ms. Sapna Mahla**, Theoretical study of electron scattering and photoionization from atmospheric aerosols. *Joined: 12/2020*
12. **Ms. Irabati Chakraborty**, Electron, positron & photon scattering from different molecular systems. *Joined: 08/2019*

PH.D. – AWARDED

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| 11. | Ms. Himani Tomer , Electron induced chemistry of molecules relevant to space applications. | <i>Awarded: 04/2024</i> |
| 10. | Dr. Nafees Uddin , Electron scattering studies on environmentally sensitive molecules. | <i>Awarded: 04/2023</i> |
| 9. | Dr. Nidhi Sinha , Theoretical study of e^- and e^+ scattering from atomic and molecular targets. | <i>Awarded: 05/2021</i> |
| 8. | Dr. Paresh Modak , Electron and photon collisions with atomic and molecular targets. | <i>Awarded: 12/2020</i> |
| 7. | Dr. Suvam Singh , Electron and positron scattering dynamics in atoms and molecules. | <i>Awarded: 12/2019</i> |
| 6. | Dr. Pankaj Verma , Investigation of electron scattering from molecules relevant to plasma. | <i>Awarded: 11/2018</i> |
| 5. | Dr. Nagendra Siwakoti , Fabrication and modification of Schottky diodes. | <i>Awarded: 03/2018</i> |
| 4. | Dr. Jaspreet Kaur , A theoretical pursuit to probe electron-molecule scattering phenomena. | <i>Awarded: 03/2016</i> |
| 3. | Dr. Biplab Goswami , e^- induced collision and ionization of technologically relevant atoms/mols. | <i>Awarded: 02/2015</i> |
| 2. | Dr. Dhanoj Gupta , e^- impact scattering cs for molecules of env. and biological importance. | <i>Awarded: 12/2014</i> |
| 1. | Dr. Rahla Nagma , e^- impact scattering studies of mols. relevant to atm. application. | <i>Awarded: 09/2014</i> |

SUMMARY OF RESEARCH SUPERVISION

| Status | Post-Doc. | Ph.D. | M.Phil. | M.Sc. | B.Tech. | Interns |
|---------|-----------|-------|---------|-------|---------|---------|
| Ongoing | 0 | 6 | 0 | 1 | 0 | 0 |
| Awarded | 2 | 11 | 3 | 32 | 8 | 3 |

For more information, click the link →

Research team

Editor Roles

- ◇ FRONTIERS IN PHYSICS - ASSOCIATE EDITOR

Peer Reviews

Journals

RECEIVED *Trusted Reviewer Status* FROM INSTITUTE OF PHYSICS (IOP)

- ◇ SPRINGER NATURE: *Scientific Reports*
- ◇ AIP: *Journal of Chemical Physics*
- ◇ IOP
 1. *Plasma Sources Science and Technology*
 2. *Journal of Physics B: Atomic, Molecular and Optical Physics*
 3. *Journal of Physics A: Mathematical and Theoretical*
- ◇ ELSEVIER
 1. *Chemical Physics Letters*
 2. *International Journal of Mass Spectrometry*
 3. *Planetary and Space Science*
 4. *Radiation Physics and Chemistry*
 5. *Physica Scripta*
 6. *Results in Physics*
 7. *Applied Radiation and Isotopes*
- ◇ SPRINGER: *The European Physical Journal D*
- ◇ RSC: *RSC Advances*
- ◇ WILEY: *International Journal of Quantum Chemistry*
- ◇ MDPI: *Atoms*
- ◇ TAYLOR AND FRANCIS: *Molecular Physics*

Projects

- ◇ SCIENCE AND ENGINEERING RESEARCH BOARD (SERB), INDIA
- ◇ SHOTA RUSTAVELI NATIONAL SCIENCE FOUNDATION (SRNSF), GEORGIA
- ◇ SHASTRI INDO-CANADIAN INSTITUTE, INDIA/CANADA
- ◇ BOARD OF RESEARCH IN NUCLEAR SCIENCES (BRNS), INDIA
- ◇ INDIAN SPACE RESEARCH ORGANISATION (ISRO)-RESPOND, INDIA
- ◇ COUNCIL OF SCIENTIFIC & INDUSTRIAL RESEARCH (CSIR), INDIA

Thesis

- ◇ INDIAN INSTITUTE OF TECHNOLOGY ROORKEE, INDIA
- ◇ INDIAN INSTITUTE OF TECHNOLOGY PATNA, INDIA
- ◇ SARDAR PATEL UNIVERSITY, INDIA
- ◇ BHARATHIDASAN UNIVERSITY, INDIA
- ◇ PRL, AHMEDABAD/MOHANLAL SUKHADIA UNIVERSITY, INDIA
- ◇ RAMAKRISHNA MISSION RESIDENTIAL COLLEGE, INDIA
- ◇ KANNUR UNIVERSITY, INDIA
- ◇ INDIAN INSTITUTE OF SCIENCE EDUCATION AND RESEARCH KOLKATA, INDIA

Professional Memberships

- | | | |
|----|---|-----------------|
| 1. | Indian Physical Society , Life member | <i>LM/0928</i> |
| 2. | Indian Society of Atomic and Molecular physics , Life member | <i>1244</i> |
| 3. | Indian Association of Physics Teachers , Life member | <i>L4818</i> |
| 4. | Indian Science Congress Association , Life member | <i>L15380</i> |
| 5. | American Chemical Society , Affiliate | <i>30697127</i> |
| 6. | American Physical Society , Affiliate | <i>61153812</i> |

Administrative Roles

Present

- Head, Department of Physics.
- Chairman, Departmental Faculty Screening Committee.
- Chairman, Doctoral Scrutiny Committees.
- Coordinator & Member, Board of Courses & Studies, Physics.
- External member, Doctoral Scrutiny Committee (DSC).
 - Electronics; Chemistry; Mathematics; English; Mining Engineering departments.

Past

ACADEMIC

- Dean Students' Welfare.
- Associate Dean (Student Activities).
- President, Sports and Physical Education Centre (SPEC).
- Technical Secretary to the Director.
- Vice-Chairman, JEE (Advanced).
- Vice-Chairman/Member, JRF Admission Committee.
- Chairman, Departmental Faculty Screening Committee.
- Member, Academic Review Committee.
- Member, Departmental Faculty Screening Committee.
- Member, Research Task Force (RTF).
- Member, International Relations.
- Member & Core Group Member, Central Library Committee.
- Member, NAAC & NBA Committee.
- Member Secretary, Departmental Advisory Committee.
- Member, Moderation Board (postgraduate program in Physics).
- Faculty-in-charge, Department Library.
- Faculty in-charge & Advisor, Integrated M.Sc. students, Physics.

OTHERS

- Coordinator, Swachh Bharat Abhiyan ('Clean India Mission').
- Chairman, ISM 90th Foundation Day Committee.
- Convener, Cencetto (Techno-Management Fest).
- Co-convener, Basant (Alumni meet).
- General Secretary, Scolomin Club (faculty and officers club).
- General Secretary, ISM Teachers Association.
- Quiz Master, Fr. Kriss Memorial inter-school Quiz competition (Jharkhand region).
- Judge in science exhibition, Dhanbad Public School.