

Shivani
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Curriculum – Vitae

Personal Details

Name	Shivani
Corresponding Address	307, Vivek Khand-3, Gomti nagar, Lucknow
Designation	Assistant Professor
Department	Physics
Institution	B.S.N.V. P.G., Lucknow
Nationality	Indian
Category	General
Marital Status	Married
Languages Known	Hindi, English
Activities/Interest	Research & Teaching

Academic Qualification

Degree	Year	Board/ Institute	Subjects
High School	2002	CBSE Board	
Intermediate	2004	CBSE Board	
B.Sc.	2008	Lucknow University	Physics, Chemistry, Mathematics
M.Sc.	2010	Lucknow University	Physics
Ph.D.	2018	Lucknow University	Spectroscopic and Quantum Chemical Modeling on the Formation and Reaction Mechanism of Organic Molecules in the Interstellar Space and Planetary Atmosphere
Research Associate	2018-2021	Lucknow University	Formation Mechanism of organic, Inorganic and Prebiotic molecules in planetary, Cometary and Interstellar medium. Funded By: Council of Science & Technology, U.P.
Research Associate	2021-2022	Lucknow University	Investigation of Interstellar Reactions of Prebiotic Molecules vital for the Formation & Evolution of Extra-terrestrial Intelligence" Funded By: Centre of Excellence, Government of U.P.

Awards

- Recipient of Best research paper award for research scholars of session 2020-21.
- Recipient of Best research paper award for research scholars of session 2019-20.
- Recipient of Best research paper award for research scholars of session 2017-18.
- Recipient of Research promotion scheme reward for research scholars of the session 2016-17
- Appreciation Certificate Award for work done in National Service Scheme, University of Lucknow, Lucknow
- Meritorious Student Award in Graduation, Isabella Thoburn College, Lucknow

Scientific Software Knowledge

- **Quantum chemical modeling and software viz., Gaussian**
- **Graphical program software for working with quantum chemistry computations: Chemcraft & Origin**

Computer Awareness

- Basic information of computer applications and softwares.
- Internet Access Knowledge

Teaching Experience

- M.Sc. Astrophysics/Asstrochemistry/Astrobiology theory classes during session 2020-2021 in University of Lucknow
- B.Sc. Astronomy theory classes during session 2020-2021 in University of Lucknow
- M.Sc. Astrophysics/Asstrochemistry/Astrobiology theory classes during session 2019-2020 in University of Lucknow
- M.Sc. Astrophysics/Asstrochemistry/Astrobiology theory classes during session 2018-2019 in University of Lucknow
- M.Sc. Astrophysics/Asstrochemistry/Astrobiology theory classes during session 2017-2018 in University of Lucknow
- M.Sc. Astrophysics/Asstrochemistry/Astrobiology theory classes during session 2016-2017 in University of Lucknow
- B.Sc. I Astronomy Theory (OPTICS) and Practical classes during session 2014-2015 in University of Lucknow
- B.Sc. I Physics Theory (OPTICS) classes during session 2014-2015 in University of Lucknow
- B.Sc. I Astronomy Theory (Electronics) and Practical classes during session 2013-2014 in University of Lucknow

- M.Sc. Electronics Practical classes during session 2012-2013 in University of Lucknow

Research Area: Quantum Chemical Study of prebiotic Molecules

Publications in Refereed Journals/Proceedings

- Quantum chemical study on the formation of isopropylcyanide and its linear isomer in the interstellar medium
Keshav Kumar Singh, Poonam Tandon, Alka Misra, **Shivani**, Manisha Yadav and Aftab Ahmad
International Journal of Astrobiology, Vol 20, Issue 1, (2021), pp. 62 – 72
Doi: <https://doi.org/10.1017/S147355042000035X>
- Formation of aminomethanol in ammonia-water interstellar ice
Keshav Kumar Singh, Poonam Tandon, Rajesh Kumar, Alka Misra, **Shivani**, Manisha Yadav, Aftab Ahmad, Manoj Kumar Chaudhary
Monthly Notices of the Royal Astronomical Society, Vol 506, Issue 2, (2021), 2059–2065
Doi: <https://doi.org/10.1093/mnras/stab1778>
- Theoretical approach to study the formation of C₂H₄O₂ in interstellar medium through reaction between interstellar Formaldehyde molecules.
Aftab Ahmad, Shivani, Alka Misra & Poonam Tandon
Research in Astronomy and Astrophysics, Vol. 20, Pg. 01-14(2020),
Doi: [10.1088/1674-4527/20/1/14](https://doi.org/10.1088/1674-4527/20/1/14)
- Theoretical Study of Possible Reaction Mechanisms for the Formation of Carbodiimide in the Interstellar Medium (ISM) and Polarizabilities of Carbodiimide.
Manisha Yadav & Shivani & Alka Misra & Poonam Tandon
Origins of Life and Evolution of Biospheres (2019) 49:89–103
<https://doi.org/10.1007/s11084-019-09577-6>
- A Quantum chemical study on the formation of Ethanamine (CH₃CHNH) in the interstellar ice.
Keshav Kumar Singh, Shivani, Poonam Tandon and Alka Misra*
Astrophysics & Space Science, Vol. 263 No.213, 2-11 (2018)
<https://doi.org/10.1007/s10509-018-3399-6>
- Formation of E-Cyanomethamine in Nitrile Rich Environment
Shivani, Alka Misra* and Poonam Tandon
Research in Astronomy & Astrophysics
Vol. 17, No.1, Pg.1-10 (2017)
<https://doi.org/10.1088/1674-4527/17/1/1>
- A theoretical quantum chemical study of Alanine formation in interstellar medium
Shivani, Parmanand Pandey, Alka Misra* and Poonam Tandon
The European Physical Journal D
Vol. 71 No.21, 1-10 (2017)
<https://doi.org/10.1140/epjd/e2017-70575-2>

- Formation of cyanoallene (buta-2, 3-dienenitrile) in the interstellar medium: a quantum chemical and spectroscopic study
 Amresh Singh, Shivani, Alka Misra and Poonam Tandon
Research in Astronomy & Astrophysics, Vol. 14, No. 3, Pg. 275-284 (2014)
<https://iopscience.iop.org/article/10.1088/1674-4527/14/3/002>
<https://doi.org/10.1088/1674-4527/14/3/002>
- Quantum-chemical approach to serine formation in the interstellar medium: A possible reaction pathway
 Shivani, Amresh Singh, Vineet Gupta, Alka Misra* and Poonam Tandon
Astronomy & Astrophysics, Vol. 563, No.A55, Pg. A55, 1-8 (2014)
<https://doi.org/10.1051/0004-6361/201118470>
- Reaction Between CH₂ and HCCN: A Theoretical Approach to Acrylonitrile Formation in the Interstellar Medium
 Shivani, Alka Misra* and Poonam Tandon
Origin of Life and Evolution of Biosphere
 Vol. 44, Pg. 143-157 (2014)
[DOI: 10.1007/s11084-014-9373-6](https://doi.org/10.1007/s11084-014-9373-6)
- Quantum chemical analysis for the formation of glycine in the interstellar medium
 Amresh Singh, Shivani, Alka Misra and Poonam Tandon
Research in Astronomy & Astrophysics, Vol. 13, No. 8, Pg. 912-920 (2013)
[DOI:10.1088/1674-4527/13/8/003](https://doi.org/10.1088/1674-4527/13/8/003)
- Formation of Isocyanogen(CNCN) in interstellar Medium
 Shivani, Alka Misra* and Poonam Tandon
Proceeding of International Symposium on Advances in functional and Biological Materials (ISAFBM-2019)
ISBN 978-93-5351-834-0
Humboldt Academy Lucknow & University of Lucknow, Lucknow, 2019 February 28
- Theoretical study of formation of Propanal (CH₃CH₂CHO) in interstellar medium.
 Aftab Ahmad, Shivani, Manisha Yadav, Keshav Singh, Alka Misra* and Poonam Tandon
Proceeding of International Symposium on Advances in functional and Biological Materials (ISAFBM-2019)
ISBN 978-93-5351-834-0
Humboldt Academy Lucknow & University of Lucknow, Lucknow, 2019 February 28
- The reaction between CH₃CN and HCOOH: A possible chemical process of Alanine formation in interstellar medium
 Shivani, Amresh Singh, Alka Misra & Poonam Tandon
Proceedings of International Conference on Astrophysics & Cosmology (ICAC)-2012
Central Department of Physics, Tribhuwan University, Kirtipur, Nepal
- Role of Cloud Computing
 Neeraj Chaubey, Alka Misra & Shivani
Proceedings of All India Seminar on Cloud Computing (2012)
IETE, Lucknow, 2012 October 13-14
- Quantum Chemical Study of a Species of Astrochemical Interest: MCDA
 Amresh Singh, Shivani, Alka Misra & Poonam Tandon
Proceedings of International Conference on Astrophysics & Cosmology (ICAC- 2012)
Central Department of Physics, Tribhuvan University, Kirtipur, Nepal, March, 19-21, 2012

- Theoretical approach for the formation of cyanoallene in Interstellar clouds.
Amresh Singh, Shivani, Alka Misra & Poonam Tandon
Proceeding of National Conference on Advancements and Futuristic Trends in Material Science [AFTMS-2011]
MJPRU, Bareilly, 2011 March 26-27, 160-165, [ISBN 978-81-8424-706-0]
- Quantum Chemical Analysis of Formation of Cytosine in the Interstellar Medium
Amresh Singh, Shivani, Alka Misra & Poonam Tandon
International Conference on Interstellar Dust, Molecules and Chemistry (IDMC-2011) (<http://www.iucaa.ernet.in/~idmc2011/presentation/P11.pdf>)
Inter-University Centre for Astronomy and Astrophysics (IUCAA), Pune. Nov.22-25, 2011
- Theoretical study and quantum chemical analysis on the formation of Ethyl Cyanide in interstellar medium
Aftab Ahamad, Shivani, Manisha Yadav, Keshav Singh, Alka Misra & Poonam Tandon
International Journal of Astrobiology (Communicated)
- ab-Initio and DFT study of HCN: Role of temperature for the formation of HCN molecule in the Interstellar Medium
Manisha Yadav, Shivani, Aftab Ahamad, Keshav Singh, Rachana Singh, Alka Misra, Poonam Tandon
Journal of Molecular structure (Under Review)

Paper Presented in National/International Conferences

- Theoretical approach for the formation of cyanoallene in Interstellar clouds.
National Conference on Advancements and Futuristic Trends in Material Science [AFTMS-2011]
Department of Applied Physics, Mahatma Jyotiba Phule Rohilkhand University, Bareilly, 2011 March 26-27
- Role of Cloud Computing
All India Seminar on Cloud Computing (2012)
IETE, Lucknow, 2012 October 13-14
- Theoretical Studies of the Formation of Guanine in Interstellar Space
International conference on Chemistry and Materials: Prospects and Prospectives-2012
Babasaheb Bhimrao Ambedkar University, Lucknow, 2012 December 14-16
- A theoretical & spectroscopic study of Acrylonitrile formation in Interstellar Medium
National Conference on Challenges & Opportunities for Technological Innovation in India, COTII-2013
Ambalika Institute of Management & Technology, Lucknow, 2013 February 16
- Theoretical approach for the reaction pathway of the formation of Cyanomethamine towards Sgr B2 (N)
Recent Trends in Material Science-2013(RTMS-2013)
MJP Rohilkhand University, Bareilly
- Theoretical and Spectroscopic study on Formation of cyanoallene in Interstellar medium
Fourth international conference on Perspectives in vibrational Spectroscopy ICOPVS-2013
Bishop Moore College, Kerela, 2013 August 6-9

- Theoretical study of the reaction pathway of cyanomethamine formation towards Sgr B2(N)
International conference on Nanoscience And Technology-2013(ICNN-2013),
Babasaheb Bhimrao Ambedkar University, Lucknow, 2013 November 18-20
- Reaction between CH₂ and HCCN: A theoretical approach of Acrylonitrile in Interstellar medium
National Conference on Role of Mathematics in Advancement of Science & technology (NCRMAST-2013)
BSNV PG College (KKV), Lucknow, 2013 October 18-20
- Theoretical approach for the reaction pathway of the formation of E-cyanomethamine towards Sgr B2 (N)
International Seminar on Advances in Bio and Nanomaterials-2013 (ISABNM-2013)
University of Lucknow, Lucknow, 2013 November 17
- Theoretical approach for E-Cyanomethamine formation in Interstellar molecular clouds
5th international conference on Perspectives in vibrational Spectroscopy-2014 ICOPVS-2014
Mar Ivanios College, Kerela, 2014 July 6-13
- Acrylonitrile Formation in Interstellar Medium: A Theoretical Approach
International Symposium on Advances in Biological & Material Sciences- 2014 (ISABMS-2014)
University of Lucknow, Lucknow, 2014 July 15
- Interstellar Molecules
One day Symposium on LateX and Allied Topics
HRDC, University of Lucknow, Lucknow, 2015 November 01
- Formation of i-Propyl Cyanide in Interstellar Medium
International Conference on Advances in Light Technologies And Spectroscopy of Materials (ICALTSM-2016)
University of Lucknow, Lucknow, 2016 January 16-18
- Quantum Chemical Study on i-propyl cyanide Formation in Interstellar Space: A theoretical Approach
National Conference on Functional Materials (NCFM-2016)
DDU Gorakhpur University, Gorakhpur, 2016 March 10-12
- A Theoretical Study on Reaction Mechanism of Carbodiimide Formation in Interstellar Medium
International conference on New Scintillations on Material Horizon (ICNSMH-2016)
MJP Ruhelkhand University, Bareilly, 2016 October 21-23
- Formation of Ethyl Cyanide in interstellar space: A Theoretical approach
6th International Conference on Perspectives in Vibrational Spectroscopy (ICOPVS 2016)
University of Lucknow, Lucknow, 2016 November 5-8
- Formation of N-methyl Formamide in interstellar medium
National symposium on Multidimensional Aspects of Spectroscopy
DDU Gorakhpur University, Gorakhpur, 2017 November 17-18

- Glycolonitrile formation in interstellar medium: A theoretical approach
International conference on Ultrasonics and materials science for advanced technology 2019 (ICUMSAT-2019)
VBS Purvanchal University, Jaunpur, 2019 November 16-18
- Formation of Isocyanogen(CNCN) in interstellar Medium
International Symposium on Advances in functional and Biological Materials (ISAFBM-2019)
Humboldt Academy Lucknow & University of Lucknow, Lucknow, 2019 February 28

Workshops/Symposium/Seminar

- Participated in International Conference on Diverse Emerging Materials and their Applications (ICDEMA-2021), Organized by Physics Department, University of Lucknow, 2021 March 14-15.
- Participated in “Workshop on high performance computing (HPC) Organized by Physics Department, University of Lucknow, 2019 Aug 5-9.
- Participated in “Workshop on Applications of Gaussian & GaussView Software” Organized by Physics Department, University of Lucknow, 2019 July 19.
- Workshop on **International capsule Workshop ‘Life in Space’, organized by** Indian Astrobiology research center Mumbai India. 2018, November 18.
- Participated in **Workshop on** FACTS CHECKING AND ONLINE VERIFICATION ON SOCIAL MEDIA PLATFORMS Council of Science and Technology, U.P. and Google News Initiative 2018, December 23
- **Volunteered as** Resource Person in Medical Health Camp during Health Conclave 2018, Atal Bihari Vajpayee Scientific Convention Center, KGMU, Lucknow, 2018 October 5-20.
- **Participation** in National seminar on Prevention of Ozone Layer
University of Lucknow, Lucknow & Chandra Vatika shiksha niketan, Mohon BKT, Lucknow 2017, September 23.
- **Participation** in National seminar on Terrestrial & Extraterrestrial Life [NSTEL-2017] organized by University of Lucknow, Lucknow & Council of Science & Technology , Lucknow, U.P. 2017, September 22.
- **Participation in** one day national seminar on Importance of Ozone Layer on Earth organized by Council of Science & Technology, Lucknow, U.P. on the occasion of world ozone day, 2017, September 20.
- **Delivered talk** on One day Seminar on World Asteroid Day organized by Council of Science & Technology , Lucknow, U.P., 2017, June 30
- Workshop on Inculcating Leadership in Higher Education Through Digital Learning, Assessment & Marking organized by IQAC, University of Lucknow, 2017, March 10
- **Delivered talk** on “Search of Extraterrestrial Life” in International Seminar on New Horizons of Astronomy (ISNHA-2016) organized by Department of Mathematics & Astronomy, University of Lucknow & Council of Science & Technology , Lucknow, U.P., 2016, November 9

- **Delivered talk** on “Black Body Radiations” in Symposium on Emerging Avenues in Science & Social Sciences (SEASS-2016) organized by Department of Mathematics & Astronomy, University of Lucknow & Rashtriya Postgraduate College, Sujanganj, Jaunpur, U.P., 2016, August 13
- **Delivered talk** on “Interstellar Space is not vacant” in Seminar for New Perspectives of Astronomy (NSNPA-2016) organized by Department of Mathematics & Astronomy, University of Lucknow & Council of Science & Technology , Lucknow, U.P., 2016, July 25
- Workshop on Diffraction, Microscopic and Spectroscopic Techniques for Material Studies organized by Department of Physics, University of Lucknow, 2015, November 7-8
- One day Symposium on LateX and Allied Topics
HRDC, University of Lucknow, Lucknow, 2015 November 01
- Workshop on Popularization of Astronomy organized by Department of Mathematics & Astronomy, University of Lucknow & SKY Foundation 2015, May 20, 22 & 23
- **Delivered talk** in Seminar on Frontiers of Astronomy organized by Department of Mathematics & Astronomy, University of Lucknow & UPAAC, Council of Science & Technology , Lucknow, U.P., 2014, June 4-5
- **Delivered talk** in Introductory Workshop of Astronomy executed by SKY Foundation during NSS camp organized by University of Lucknow & Council of Science & Technology , Lucknow, U.P., 28 January 2014
- **Delivered talk** in Workshop on Space Science & Astronomy (WSSA-2014) organized by Department of Mathematics & Astronomy, University of Lucknow & IGP, CST, SKY and SRIJAN, 2014, June 18 & 19 (at Shahjahanpur)
- **Delivered talk** on “Extraterrestrial Life” in National Seminar for Popularization of Astronomy (NSPA-2013) organized by Department of Mathematics & Astronomy, University of Lucknow & Council of Science & Technology , Lucknow, U.P., 2013, November 24-26
- **Delivered talk** on “Molecules in Interstellar Medium” in National Seminar for Popularization of Astronomy (NSPA-2013) organized by Department of Mathematics & Astronomy, University of Lucknow & Council of Science & Technology , Lucknow, U.P., 2013, December 22-24
- Workshop on Education and Employability: Opportunities & Challenges at Internal Quality Assurance Cell (IQAC), University of Lucknow, 2013 April 13
- 3rd international Symposium on Modern Trends in Differential Geometry and Mathematical Modelling in Bio-Sciences at University of Lucknow, Lucknow, 2011 January 15-16

Webinars

- Participated in The Training on Cyber Crime Awareness Programme under Mission Shakti Campaign-2020 organized by UP Govt., NSS, CellCom, Unicef on 2020, November 1.
- Participated in National e-workshop on “ Technological Tools and Their Management in Online Teaching” organized by MJP Rohilkhand University, Bareilly, 2020 August 14-21.
- Participated in web quiz competition titled “CSTUP Astronomy Quiz” organized by Council of Science & Technology, U.P. for creating awareness about Basic Astronomy.

- Participated in National Webinar on “Post Covid-19 India: Health and Wellbeing” organized by Era’s Lucknow College of Management and Education, Ghaila, IIM Road Lucknow, 2020 June 23.
- Participated in National Webinar on “Online Teaching During Covid-19 Pandemic-Prospects & Problems” organized by Mahila Vidyalaya Degree College, Lucknow on 2020, May 25.
- Participated in webinar on Future Opportunities for the Youth organized by Sunrays Social & Educational Consultancy, Lucknow, 2020 May 24.
- Participated in National Two Day Webinar on “General Awareness and Stress Management in Covid-19 Pandemic & How to Boost Your Immunity” organized by Health City & Mahila Vidyalaya, Lucknow, 2020 May 20 & 21.
- Participated in online “International Workshop on Space Science” jointly organized by Space Education and Research Foundation, Ahmedabad and Department of Physics, School of Science, RK University, Rajkot, India during 2020 May 18-21.
- Participated in online “International Day of Light-A global initiative by UNESCO” organized by University of Lucknow, Lucknow, 2020 May 15 & 16.
- Participated in Webinar on “Biomedical Applications of Raman Spectroscopy” organized by University of Lucknow, Lucknow, 2020 May 11.
- Participated in Webinar on “E- Course on Atmosphere” organized by Space Education and Research Foundation, Ahmedabad, India, 2018 April 11-14.

Short Term Course

- Participated in UGC Sponsored Short Term Course in Latex & Allied Topics From October 27- November 02, 2015 at University of Lucknow

Extra Curricular Activities

- Participated in “Emerging Trends in Artificial Intelligence, Cyber Security, Cyber Security and Digital Payment Systems” organized by CST, UP, 2020, January 10.
- Participated in launch of “Sachal Vigyan Darshan” programme held at Vigyan Bhawan, organized by CST, UP, 2018, October 2.
- Participated as Jury Member in Oral and Poster Competitions under the theme **POSHAN MAAH** organized by National Service Scheme, University of Lucknow, 2019 September 28-29
- Participated in one day seminar on **Powering Change: “Women in Innovation & Creativity”** on the occasion of “World Intellectual Property Day” organized by CST, UP, 2018, April 28
- **Participated in** debate competition on “Swami Vivekanand: Life, Teaching & Contributions” organized by NSS, University of Lucknow, Lucknow & Department of Mathematics & Astronomy, University of Lucknow, Lucknow, 2017, September 4.

- Participated in the Cleaning and Maintenance of the area between CLL and Department of Mathematics 7 Astronomy, University of Lucknow programme , organized by NSS, University of Lucknow, Lucknow. 2017 February 7-12
- Member of organizing committee of “One day Competitions under National Youth Week” jointly organized by newstimes & National Service Scheme, University of Lucknow, Lucknow, 2017, January 17
- Participated in Heritage Walk during Convocation Week of University of Lucknow, Lucknow, 2017, January 11
- Participated as a Volunteer in various competitions organized by Sanskriti-Visual Arts, University of Lucknow, Lucknow, 2017, January 11,12
- Participated as a Volunteer in “*Shramdaan-Pots & Tree painting*” during Convocation Week, University of Lucknow, Lucknow, 2017, January 9
- Participated in 24 Days Campaign of “*Din Bhi Hamara Raat bhi Hamari Programe*”, organized by NSS, University of Lucknow, actionaid and Yes Foundation on November 2016, December 25
- Participated in Seminar on “Hands Up for HIV Prevention” organized by NSS, University of Lucknow, Lucknow and UPSACS on 2016 December 1
- Member of Organizing Committee in 6th International Conference on Perspectives in Vibrational Spectroscopy(ICOPVS 2016) organized by University of Lucknow, 2016, November 5-8
- Presented Paper on “Challenges and Issues of Women Empowerment” in National Seminar on “Women Empowerment for Healthy Nation-Emerging Perspectives & Issues” Organized By Department of Physical Education DAVPG College, Lucknow, 2016, February 29
- Participated in the 5th National Youth Conference on Human Rights in Lucknow University, 2015, December 10
- Attend 5 day Peer educator’s training programme of Red Ribbon Club, organized by NSS, University of Lucknow, 2013, February 11-15
- Participated in the self defense Training Program “Mission Black Belt” at University of Lucknow, 2013, December 16-18
- Winner of KNOW YOUR VOTER QUOTIENT
- Recipient of Certificate Award for the completion of Legal Awareness Training Program organized by National Service Scheme, University of Lucknow, Lucknow
- Recipient of Certificate Award for the outstanding contribution under National Service Scheme, University of Lucknow, Lucknow

Memberships

- Life time member of UPAAC, Indira Gandhi Planetarium, Lucknow
- Life time Membership of Indian Science Congress
- Member of Red Ribbon Club, National Service Scheme

Fellowships

- Working as research associate in the CST major project since (May-2018-present)
- JRF in Major Research Project-UGC(January 2011-March 2013)
- SRF in UGC-BSR Fellowship-UGC(March 2013- December 2017)
- Research Associate ship from CST, U.P. and COE, Govt. of U.P. (2018-2022)