

# CURRICULAM VITAE

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## ***Personal Details***

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## ***Present affiliation***

- At present a visiting research fellow at **Institute of Astronomy Space and Earth Science**. (from 2023)
- Thesis submitted to the University of Calcutta for the PhD from **Indian Centre for Space Physics** under the Supervision of Dr. Ankan Das and Prof. Sandip Kumar Chakrabarti. (2017-2023).
- **Field of research** : Astrochemistry and Astrobiology.
- **Topic of research** : My thesis title is "**Extraction Of Physical Properties Of Interstellar Medium from The observed line Profiles**". In my thesis work, I would mainly investigate the physical properties and kinematics of different star-forming regions using radiative transfer modeling. Observed spatial differentiation between various key molecules will be used to explain their physical structure or evolution and various microphysical effects. In addition, some key molecules will be used to study the various evolutionary phases.

## ***Academic Details***

- Class 10 level degree

Score in % : 84.75 [96% in science sub.]  
Name of Board : WBBSE  
Year of Passing : 2009

- HS or equivalent 10+2 level degree

Score in % or CGPA : 88.4  
% score in science subjects : 89.66  
Name of Board : WBCHSE  
Year of Passing : 2011

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- BSc or equivalent degree

Score in % or CGPA : 68.87  
Subject of Honors/Major : Physics  
Name of University or Institute : University of CALCUTTA  
Serampore college  
Year of Passing : 2014

- Msc or equivalent degree

Score in percentage : 86.3  
Subject : physics  
Name of the institute : IIT Guwahati  
Year of passing : 2016

- Msc project : Black hole entropy calculation using brick wall model under the guidance of Sayan Chakrabarti (IITG).
- M.Sc subjects : GTR,QFT,Magnetism & superconductivity

## ***Fellowship :***

DST INSPIRE

## ***National level examination qualified:***

*JAM, JEST & GATE IN 2017 , INAT(written)*

## ***Research interest:***

*Astrochemistry (Radiative transfer modeling to estimate the physical properties of the star-forming regions from molecular line emission).*

## ***Skills***

- Programming in C language & FORTRAN in basic level
- Graph plotting using gnuplot & xmgrace in UNIX
- Application of origin and excel .
- software known-CASSIS, RATRAN, RADEX.
- Learning LIME and CLOUDY.

## ***Seminar and workshop attended:***

1. Attended the seminar 'Astrochemistry in the Thz domain' from 30<sup>th</sup> -31<sup>st</sup> october, 2017 at CHENNAI,INDIA.

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Oral presentation: Applying radiative transfer modeling to astrochemistry. (10 min).

2. Attended the conference 'Exploring the Universe: Near Earth Space Science to Extra-Galactic Astronomy' from November 14<sup>th</sup> - 17<sup>th</sup> November, 2018 at S.N.B.N.C.B.S, Kolkata, India.

Oral presentation: Radiative transfer modeling of some observable Interstellar species. (10 min)

3. Poster presented in COSPAR 2018, poster title: Radiative transfer modelling of some potentially observable interstellar species.

4. Poster presented in "International Conference on Infrared Astronomy and Astrophysical Dust" from 22<sup>nd</sup> - 25<sup>th</sup> October, 2019 at IUCAA, Pune, INDIA.

5. Oral presentation in COSPAR 2021 virtual conference.

Oral presentation: Radiative transfer modeling to explain the observed Inverse P-Cygni profile in a high mass star-forming region.

6. Oral presentation in Atomic Molecular and Optical Physics Division Seminar (virtually), 29<sup>th</sup> July, 2021. Title: Radiative transfer modeling to explain the observed line profiles of a hot molecular core.

7. Attended conference Astrochemical Frontiers - Quarantine Edition 2, July 5 - 9, 2021 – online.

8. Oral presentation in COSPAR 2022 44<sup>th</sup> Scientific Assembly (Athens, Greece, 16 July – 24 July). Title: Radiative transfer model to explain the observed line profiles of a hot molecular core, G31.41+0.31.

## ***Publications:***

- Chemical modeling for predicting the abundances of certain aldimines and amines in hot cores [Sil, M., Gorai, P., Das, A., Bhat, B., Etim, E.E., & Chakrabarti, S.K., 2018, ApJ, 853, 139.]

- Identification of Prebiotic Molecules Containing Peptide-like Bonds in a Hot Molecular Core, G10. 47+ 0.03 [Gorai, P., Bhat, B., Sil, M., Mondal, S.K., Ghosh, R., Chakrabarti, S.K., & Das, A., 2020, ApJ, 895, 86.]

- Exploring the Possibility of Identifying Hydride and Hydroxyl Cations of Noble Gas Species in the Crab Nebula Filament [Das, A., Sil, M., Bhat, B., Gorai, P., Chakrabarti, S. K., & Caselli, P., 2020, ApJ, 902, 131.]

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- Identification of Methyl Isocyanate and Other Complex Organic Molecules in a Hot Molecular Core, G31.41+0.31 [Gorai, P., Das, A., Shimonishi, T., Sahu, D., Mondal, S.K., Bhat, B., & Chakrabarti, S.K., 2021, ApJ, 907, 108.]
- Chemical complexity of phosphorous bearing species in various regions of the Interstellar medium [Sil, M., Srivastav, S., Bhat, B., Mondal, S.K., Gorai, P., Ghosh, R., Shimonishi, T., Chakrabarti, S. K., Shivaraman, B., Pathak, A., Nakatani, N., Furuya, K., & Das, A., 2021, AJ, 162, 119]
- Radiative transfer modeling of the observed line profiles in G31.41+0.31 [Bhat, B., Gorai, P., Mondal, S.K., Chakrabarti, S. K., & Das, A., 2021, ASR, 69, 415-437]
- Investigating the hot molecular core, G10.47+0.03, a pit of nitrogen-bearing complex organic molecules [Mondal, S.K., Iqbal, W., Gorai, P., Bhat B., Wakelam, V., & Das, A, 2022, A&A, 669, A71]
- Chemical evolution of some selected complex organic molecules in low-mass star-forming regions [Bhat, B., Kar, R., Mondal, S.K., Ghosh, R., Gorai, P., Shimonishi, T., Tanaka, K., Furuya, K., & Das, A., 2023, ApJ (Accepted)]