Dr. Ankan Das

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Curriculum vitae

Personal and contact details:
Name - Ankan Das
Permanent address: Bhatenda, Rajarhat Choumatha, P.O. : Rajarhat, Dist. : North 24 parganas, Pin : 700135, West Bengal, India
Present address: 301, Block A, Sadhukhan Apartment P.O.: Rajarhat, Dist.: North 24 parganas, Pin: 700135, West Bengal, India
Date of Birth-08/01/1980
Nationality- Indian
Religion- Hindu
Mother Tongue- Bengali
Marital Status- Married
Blood Group - B^+
Gender-Male

Present affiliation- Associate Professor at Institute of Astronomy and Space Science

Research Interest

More than 270 molecules have been identified in interstellar space. This chemical diversity demands an understanding of how, when, and where these molecules were produced and excited. Briefly, my research work is orientated around some of the general inquiries. Such as, what does a molecule tell us about temperature, densities, gas masses, ionization rates, radiation fields, gas heating-cooling, and internal dynamics of the clouds, etc.? How were they cycled through various phases of stellar evolution, from birth to death? How far does chemical complexity can go? and the most far-reaching of all: can interstellar molecules become part of new planetary systems and form the building blocks for life elsewhere in the Universe, as it supposed to happen in our solar system?

Education and Qualifications

1. **Madhyamik (M.P)**- From Bishnupur Sir Romesh Institution (Board-WBBSE) completed in 1995 – First division (72%)

2. **Higher Secondary (H.S)**- From Bishnupur Sir Romesh Institution (Board-WBCHSE) completed in 1997 - First division (68.4%)
3. **Bachelor of Science (B.Sc)** - From Maharaja Manindra Chandra College (University of Calcutta)-PHYSICS HONOURS- completed in 2000 - First class (61.25%)
4. **Master of Science (M.Sc)**-From University College of Science and Technology, Rajabazar Science College (University of Calcutta) completed in 2002 - First class 65.2%
5. **Doctor of Philosophy (Ph.D.)**- From the University of Calcutta 2009
6. **After submitting Ph.D. Thesis**- University of Leiden, Netherlands 2009-2010 as a Greenberg Fellow
7. **Postdoctoral Fellow (PDF)**-From Indian Centre for Space Physics 2010

Awards and Honours

1. **Associate Editor** of the Astrochemistry section of **Frontiers in Astronomy And Space Sciences** Journal, 2020-
2. **J. Mayo Greenberg Scholarship Prize** 2008, **University of Leiden**, Netherlands
3. **Best Young Scientist** award from **R-Plus** Bengali News Channel, 11^{th} August 2013
4. Two of our published papers in the New Astronomy journal (ELSEVIER) in 2013 have been recocognized to be the most highly cited papers during 2014, 2015 and up until June 2016 by New Astronomy Journal.
5. Received Gold Medal from the Maharaja Manindra Chandra College for securing first class position in B.Sc.
6. My research work is pointed out in Nature India, with a title "Life in a grain of cosmic dust" on 18^{th} July 2008.
7. My research work is pointed out in Nature India, with a title "Space recipe for life making molecules" on 20^{th} February 2013.
8. My research work is pointed out in Nature India, with a title "Heavier hydrogen unveils secrets of protostars" on 17^{th} November 2014.
9. My research work is pointed out in Nature India, with a title "Recreating astronomical ices on earth " on 27^{th} February 2017.
10. Life member of Indian Centre for Space Physics.
11. GATE in 2003
12. JEST in 2003

Positions held

1. Associate Professor, Institute of Astronomy Space and Earth Science (2022-)
2. Assistant Professor-II, ICSP (July 2015-2022)
3. Dean (Academic Programme), Indian Centre for Space Physics (2010-2020)
4. Head of the Department, of Astrochemistry/Astrobiology, ICSP (2010-2020)
5. Academic Adminstrative member of ICSP (2012-2020)
6. Member of Academic Council of ICSP (2012-)
7. Acting Finance officer, Indian Centre for Space Physics (2012-2020)
8. Extended Faculty of University of Gour Banga (2014), Maldah, West Bengal, India
9. Guest Faculty at Ramakrishna Mission Residential College Narendrapur, West Bengal, India (2010-)

10. Adjunct Professor at Ilia State University Georgia, 2011-2013, Georgia
11. Assistant Professor-I, ICSP (April 2010- June 2015)
12. Post Doctoral Fellow, ICSP, (2010)
13. Theoretical Physics Seminar Circuit, January 2010, S N Bose National Centre for Basic Sciences, India
14. Extended Visitor and Linkage programme, October 2009 to December 2009, S N Bose National Centre for Basic Sciences, India.
15. Greenberg Fellow, University of Leiden, Netherlands, 2009
16. Senior Research Fellow, Indian Centre for Space Physics, 2005-2008
17. Junior Research Fellow, Indian Centre for Space Physics, 2003-2005
18. Guest lecturer of Physics in Maharani Kaseswari College, 2002-2003, Kolkata, India
19. Guest lecturer of Electronics in Maharaja Manindra Chandra College, 2002-2003, Kolkata, India

Computer Skill
Linux, Windows
Language known- Fortran, Python Basics
Plotting tools: Xmgrace, Gnuplot, Origin,
Software known- GAUSSIAN 09, CASSIS, ASCP PROGRAM, CASA, GILDAS, Radex, RATRAN.

Title of Ph.D. Thesis Hydrodynamic simulation of the formation of protostars during molecular cloud collapse and the chemical evolution in these processes

Projects

1. Principal Investigator of India-Japan (DST-Japan Society for the Promotion of Science) Cooperative Science Programme (IJCSP) for the project entitled "Unveiling the physical structure and chemical composition of hot molecular cores by observation and astrochemical model" with Dr. Takashi Shimonishi of the Tohoku University. Project cost-9.6 lac, Project duration- 2020-2022, Status = ongoing.
2. Principal Investigator of an ISRO Respond project entitled "Interstellar chemistry as a powerful tool to investigate the physical conditions around the star forming regions and protoplanetary disks". Project cost: Rs. 21,22,000/-, Project duration:2017-2020, Status= completed.
3. Principal Investigator of a DST project entitled "Modeling of Interstellar Gas-Grain Chemistry and study the spectral properties of some complex Interstellar molecules". Project cost ~ 28.25 lac, Project duration: 2014-2017, Status= completed.
4. Principal Investigator of an ISRO Respond Project entitled "Study of the Interstellar processes leading to the deuterium enrichment." Project cost ~ 15.6 lac Project duration:2012-2015, Status = completed.

PhD. students

Registered Ph.D supervisor (Theoretical Physics department) of the University of Calcutta.

1. **Dr. Dipen Sahu** got his Ph.D. degree from the University of Calcutta in 2017. After submitting his Thesis, he was a Postdoctoral fellow at **Physical Research Laboratory**, India and then visiting fellow at **Tata Institute of Fundamental Research**, India and Post Doctoral Fellow at **Indian Institute of Astrophysics**, India. Presently he is a **Postdoctoral Fellow at the Academica of Sincia, Taiwan**. He will join as a **Ramanujan Fellow at Physical Research Laboratory** soon. Title of the Thesis- Astrophysical processes leading to deuterium enrichment of the interstellar medium.
2. **Dr. Pasanta Gorai** got his Ph.D. degree from the University of Calcutta in 2020. He received PDF offer from the University of Tokyo (Japan), Yunnan University (China), Peking University and Shanghai Astronomical Observatory (China), Chalmers University of Technology (Sweden). Finally, he joined the **Chalmers University of Technology as a Postdoctoral Fellow**.Title of the Thesis- Gas-Grain Interaction and Spectral Properties of Several Complex Molecules in the Interstellar Medium.
3. **Dr. Milan Sil** got his Ph.D. degree from the University of Calcutta in 2022. Presently, Dr. Sil is a Postdoctoral Fellow at the **S. N. Bose National Centre for Basic Sciences. He is going to join IPAG, Grenoble, France from 1st June 2023 as a Postdoctoral Fellow**. He was an DST-INSPIRE Fellow. Thesis title- Physics and chemistry of star forming region and protoplanetary disk.
4. **Suman Kumar Mondal**, was a CSIR Fellow (Ph.D. registration at the University of Calcutta. Present status- **submitted** his Ph.D. thesis to the University of Calcutta. Thesis title- Understanding the structure of hot molecular cores through analysis of observational data
5. **Bratati Bhat**, INSPIRE fellow (Ph.D. registration at the University of Calcutta. Present status-**writing Thesis**). Thesis title-Extraction of physical properties from the observed line profiles of Interstellar medium.
6. **Rana Ghosh** (Ph.D. registration at the University of Calcutta). Mr. Ghosh went to **Taiwan for period of 9 months** to conduct experimental research with one of my collaborator Prof. Bing Ming Cheng. Thesis title- Understanding The Evolutionary Stages Of The Star-forming Region By Chemical Diversity

MSc. project students

1. Supervised **Rumela Kar** (MSc student from the **Jadavpur University**) in the project entitled Detection and analysis of complex organic compunds in different star forming regions using Markov Chain Monte Carlo method in 2021.
2. Supervised **Soutan Adak** (MSc student from **Ramakrishna Mission Residential College Narendrapur**), in the project An approach to estimate the binding energy of interstellar species in the year 2021.
3. Supervised **Soutan Adak** (MSc student from **Ramakrishna Mission Residential College Narendrapur**), in the project Effect of binding energy on encounter desorption in the year 2021.

4. Supervised **Dibyendu Sardar** (MSc student from **Ramakrishna Mission Residential College Narendrapur**), in the project Sulfur fractionation in various stages of the stellar evolution in the year 2020.
5. Supervised **Kaustav Karmakar** (MSc student from **Ramakrishna Mission Residential College Narendrapur**), in the project Ionization Degree In Various Stages Of The Stellar Evolution in the year 2020.
6. Supervised **Amaresh Das** (MSc student from **Ramakrishna Mission Residential College Narendrapur**), in the project Interstellar monohydric alcohols and their thiol analogues in the year 2016.
7. Supervised **Soumyadip Mondal** (MSc student from **Ramakrishna Mission Residential College Narendrapur**), in the project Study the Chemical evolution and spectral properties of HCO+ and HCN, which are found to be coexistent in Molecular cloud and have systematic Line width differences in the year 2014.
8. Supervised **Prasanta Gorai** (MSc student from **Ramakrishna Mission Residential College Narendrapur**), in the project Co-relate Ionization degree of Interstellar medium with Deuterium enrichment of Interstellar ions and using CASSIS spectrum analyzer for calculating various spectral aspects of these interstellar ions in the year 2014.
9. Supervised **Chandan Mahapatra** (MSc student from **Ramakrishna Mission Residential College Narendrapur**), in the project A quantum chemical simulation to study the spectral and chemical parameters of Interstellar Formamide in the year 2012.
10. Supervised **Gourav Ghosh** (MSc student from **Ramakrishna Mission Residential College Narendrapur**), in the project Formation of molecular hydrogen on the Interstellar grains: A time dependent study in the year 2011.
11. Supervised **Kisholoi De** (MSc student from **Ramakrishna Mission Residential College Narendrapur**), in the project Recombination efficiency of Molecular Hydrogen on Interstellar Grains in the year 2010.

Editor

1. Edited "Exploring the chemical Universe" from Frontiers in Astronomy And Space Sciences Journal (Astrochemistry section). Co-editors: Luca Bizzocchi (Max Plank Institute for Extraterristrial Physics, Germany), Piero Ugliengo (University of Turin, Italy)
2. Editing "Reviewes in Astrochemistry" Frontiers in Astronomy And Space Sciences Journal (Astrochemistry section).. co-editors: Majdi Hochlaf (Université Paris-Est Marne-la-Vallée, France), Ryan C. Fortenberry (University of Mississippi, Oxford, US)
3. Editing "Cosmic Dust – its Formation, Processing, and Destruction" Frontiers in Astronomy And Space Sciences Journal (Astrochemistry section).. co-editors: David Gobrecht (University of Gothenberg, Sweden).
4. Editing "Hot Topic: Molecular Complexity in Astrophysical Environments" Frontiers in Astronomy And Space Sciences Journal (Astrochemistry section).. co-editors: Sergio Pilling (UNIVAP, Brazil), Gyorgy Tarczay (Eotvos Lorand University, Budapest, Hungary), Federico Palazzetti (University of Perugia, Italy), Chris Arumainayagam (Wellesley College, US).
5. Co-Editor of the American Institute of Physics Conference Series, 2013, Vol. 1543 , proceedings on First international conference on Chemical Evolution of the Star Forming Region and the Origin of Life
6. Co-Editor of Astrochemistry Letter, published by Astrochemistry Society of India, 2014-

Editorial Board

1. Associate Editor of the Asdtrochemistry section of Frontiers in Astronomy And Space Sciences Journal.
2. Astrochemistry Letters by Astrochemistry Society of India.

Reviewer

1. Astrophysical Journal
2. MNRAS
3. Advances in Space Research
4. New Astronomy
5. Frontiers in Astronomy And Space Sciences
6. Planetary and Space Sciences
7. European Physical Journal D

Conference Organized

1. Conference chair and Main scientific organizer of the international webinar on DIG (Dust, Ice and gas) Astrochemistry, 17-18th November, 2022 organized by IASES, PRL, Europlanet society and NU-q
2. Main Scientific Organizer of the session F3.1 in the COSPAR 2022 at Athens, Greece
3. Main Scientific Organizer of the session F3.1 in the COSPAR 2020 at Sydney, Australia
4. SOC member of the "Exploring the Universe: Near Earth space science to extragalactic astronomy" will be held in November 14-17, 2018, at S. N. Bose National Centre for Basic Sciences, Kolkata (INDIA).
5. Main Scientific Organizer of the session F3.5 (The Evolving Universe and the Origin of Life) in the COSPAR 2018 during July, 2018, Pasadena, USA
6. Scientific organizer of Astrochemistry in the THz domain held in Chennai, India during $30 - 31^{st}$ October 2017.
7. SOC member of the session F3.1 (Astrochemistry, Astrobiology, and the Formation of Life in the Universe) in the forthcoming COSPAR 2016 during 30th July - 7th August, 2016, Istanbul, Turkey
8. Main Scientific Organizer of the session F3.5 (Chemical Evolution of Star Forming Regions: Observations, Experiment and Theory) in COSPAR 2012 during 15-16th July 2012, Mysore, India
9. LOC and co-convener of "Chemical Evolution of the Star Forming Region and the Origin of Life" during 10-13th July 2012 at S. N. Bose National Centre for Basic Sciences, Kolkata, India.

List of publications

In Journals:

Total number of publication in the refereed journals: **55**
Total impact factor of the published/accepted papers: **215.8**
Average impact factor:**4**

1. **Chemical evolution of some selected complex organic molecules in low-mass star-forming regions**, 2023, Bratati Bhat, Rumela Kar, Suman Kumar Mondal, Rana Ghosh, Prasanta Gorai, Takashi Shimonishi, Kei E. I. Tanaka, Kenji Furya, and **Ankan Das**, **ApJ**, **(I.F.=5.909)**.
2. **Editorial: Cosmic dust—its formation, processing, and destruction**, 2023, David Gobrecht, **Ankan Das**, Robin Baeyens, Thiébaut-Antoine Schirmer.**Frontiers in Astronomy and Space Sciences**, 10.3389/fspas.2023.1242545 **(I.F.= 4.055)**.
3. **Digging into the Interior of Hot Cores with ALMA (DIHCA). III: The Chemical Link between NH_2CHO, HNCO, and H_2CO**, 2023, Kotomi Taniguchi, Patricio Sanhueza, Fernando A. Olugin, Prasanta Gorai, **Ankan Das**, Fumitaka Nakamura, Masao Saito, Qizhou Zhang, Xing Lu, Shanghuo Li, Huei-Ru Vivien Chen, **ApJ**, **(I.F.=5.909)**.
4. **Mid-IR and VUV Spectroscopic Characterisation of Thermally Processed and Electron Irradiated CO2 Astrophysical Ice Analogues**, 2023, D.V. Mifsud,Z. Kaňuchová, S. Ioppolo, P. Herczku, A. Traspas Muiña, T.A. Field, P.A. Hailey, Z. Juhász, S.T.S. Kovács, N.J. Mason, R.W. McCullough, S. Pavithraa, K.K. Rahul, B. Paripás, B. Sulik, S.-L. Chou, J.-I. Lo, **Ankan Das**, B.-M. Cheng, B. N. Rajasekhar, A. Bhardwaj, and B. Sivaraman ,**Journal of Molecular Spectroscopy**, **(I.F.=1.5)**.
5. **Investigating the hot molecular core, G10.47+0.03, a pit of nitrogen-bearing complex organic molecules**, 2022, Suman Kumar Mondal, Wasim Iqbal, Prasanta Gorai, Bratati Bhat, Valentine Wakelam, and **Ankan Das**, **Astronomy and Astrophysics** (accepted), **(I.F.=6.209)**.
6. **Astrochemical model to study the abundances of branched carbon-chain molecules in a hot molecular core with realistic binding energies**, 2022, Satyam Srivastav, Milan Sil,Prasanta Gorai, Amit Pathak, Bhalamurugan Sivaraman, and **Ankan Das**, **MNRAS**, 515, 3524, **(I.F. = 5.231)**.
7. **Editorial: Exploring the Chemical Universe**, 2022, **Ankan Das**, Luca Bizzocchi, Piero Ugliengo, **Frontiers in Astronomy and Space Sciences**, 10.3389/fspas.2022.839076 **(I.F.= 4.055)**.
8. **Phenol in high-mass star-forming regions**, 2022, Rana Ghosh, Milan Sil, Suman Kumar Mondal, Prasanta Gorai, Dipen Sahu, Rahul Kumar Kushwah, Bhalamurugan Sivaraman, **Ankan Das**, **accepted for publication in Research in Astronomy and Astrophysics**, **I.F.=1.5**
9. **Is there any linkage between interstellar aldehyde and alcohol?**, 2021, Suman Kumar Mondal, Prasanta Gorai, Milan Sil, Rana Ghosh, Emmanuel E. Etim, Sandip K Chakrabarti, Takashi Shimonishi, Naoki Nakatani, Kenji Furuya, Jonathan C. Tan, & **Ankan Das**, **Astrophysical Journal**, 902, 131, **(I.F.=5.909)**.
10. **Radiative transfer modeling of the observed line profiles in G31.41+0.31**, 2021, Bratati Bhat, Prasanta Gorai, Suman Kumar Mondal, Sandip K. Chakrabarti, & **Ankan Das**,

Advances in Space Research, https://doi.org/10.1016/j.asr.2021.07.011, **(I.F.=2.152)**

11. **Chemical complexity of phosphorous bearing species in various regions of the Interstellar medium** , 2021, Milan Sil, Satyam Srivastav, Bratati Bhat, Suman Kumar Mondal, Prasanta Gorai, Rana Ghosh, Takashi Shimonishi, Sandip K. Chakrabarti, Bhalamurugan Sivaraman, Amit Pathak, Naoki Nakatani, Kenji Furuya, & **Ankan Das**, The Astronomical Journal,https://ui.adsabs.harvard.edu/abs/2021arXiv210514569S, **(I.F.=6.263)**.
12. **Effect of binding energies on the encounter desorption**, Ankan Das, Milan Sil, Rana Ghosh, Prasanta Gorai, Soutan Adak, Subhankar Samanta, Sandip K. Chakrabarti, Frontiers in Astronomy and Space Sciences, 8, 78, **(I.F.=4.055)**
13. **Identification of Methyl Isocyanate and Other Complex Organic Molecules in a Hot Molecular Core, G31.41+0.31**, 2020, Prasanta Gorai, **Ankan Das**, Takashi Shimonishi, Dipen Sahu, Suman Kumar Mondal, Bratati Bhat, & Sandip K. Chakrabarti, Astrophysical Journal, 2, 907, **(I.F.=5.909)**
14. **Exploring the Possibility of Identifying Hydride and Hydroxyl Cations of Noble Gas Species in the Crab Nebula Filament**, 2020, **Ankan Das**, Milan Sil, Brati Bhat, Sandip K. Chakrabarti, & Paola Caselli, Astrophysical Journal, 902, 131, **(I.F.=5.909)**
15. **Constraints of the Formation and Abundances of Methyl Carbamate, a Glycine Isomer, in Hot Corinos**, 2020, Dipen Sahu, Sheng-Yuan Liu, **Ankan Das**, Prasanta Garai, Valentine Wakelam, Astrophysical Journal, 899, 65, **(I.F.=5.909)**
16. **Identification of Prebiotic Molecules Containing Peptide-like Bonds in a Hot Molecular Core, G10.47+0.03**, 2020, Prasanta Gorai, Bratati Bhat, Milan Sil, Suman Kumar Mondal, Rana Ghosh, Sandip K. Chakrabarti & **Ankan Das**, Astrophysical Journal, 895, 86, **(I.F.=5.909)**
17. **A Systematic Study on the Absorption Features of Interstellar Ices in Presence of Impurities**, 2020, Prasanta Gorai, Milan Sil, **Ankan Das**, B. Sivaraman, Sandip K. Chakrabarti, Sergio Ioppolo, Cristina Puzzarini, Zuzana Kanuchova, Anita Dawes, Marco Mendolicchio, Giordano Mancini, Vicenzo Barone, Naoki Nakatani, Takashi Shimonishi, & Nigel Mason, ACS Earth and Space Chemistry Journal, 4, 920 **(I.F.=2.243)**
18. **Chemistry and physics of a low-metallicity hot core in the Large Magellanic Cloud**, Takashi Shimonishi, **Ankan Das**, Nami Sakai, Kei E. I. Tanaka, Yuri Aikawa, Rakashi Onaka, Yoshimasa Watanabe & Yuri Nishimura, 2020, Astrophysical Journal, 853, 139 **(I.F.= 5.909)**.
19. **Residue from vacuum ultraviolet irradiation of benzene ices: Insights into the physical structure of astrophysical dust**, Spectrochimica Acta Part A, 2020, K. K. Rahula, E. Shivakarthik, J. K. Meka, **Ankan Das**, V. Chandrasekaran, B. N. Rajasekhar, J. I. Lo, B. M. Cheng, P. Janardhan, Anil Bhardwaj, N. J. Mason, & B. Sivaraman, 231, 117797 **(I.F. = 4.098)**.
20. **Detectable interstellar anions: Examining the key factors**, Emmanuel E. Etim, Prasanta Gorao, Rana Ghosh, **Ankan Das**, Spectrochimica Acta Part A, 2020, 230, 118011 **(I.F. = 4.098)**
21. **Infrared attenuation due to phase change from amorphous to crystalline observed in astrochemical propargyl ether ices**, Rahul K K, J K Meka, S Pavithraa, P Gorai, **Ankan Das**, J-I Lo, B N Raja Sekhar, B-M Cheng, P Janardhan, A Bhardwaj, N J Mason & Bhalamurugan Sivaraman, 2020, Spectrochimica Acta Part A, 5, 224, **(I.F. = 4.098)**
22. **Chemical and radiative transfer modeling of propylene oxide**, Ankan Das, Prasanta

Gorai, Sandip K. Chakrabarti, 2019, Astronomy & Astrophysics, 628, A73, **(I.F.=6.209)**.

23. **Interstellar hydrogen bonding**, Emmanuel Etim, Prasanta Gorai, **Ankan Das**, Sandip K. Chakrabarti, E. Arunan, 2018, Advances in Space Research, 61, 11, 2870 **(I.F.=2.152)**.
24. **An Approach to Estimate the Binding energy of Interstellar Species**, Ankan Das, Milan Das, Prasanta Gorai, Sandip K. Chakrabarti, Jean-Christophe Loison, 2018, The Astrophysical Journal Supplement Series, 237, 1 **(I.F.=8.311)**.
25. **Deuterated Formaldehyde in the low mass protostar HH212**, Dipen Sahu, Young-Chol Minh, Chin-Fei Lee, Sheng-Yuan Liu, **Ankan Das**, Sandip K. Chakrabarti, Bhala Sivaraman , 2018, MNRAS, 475, 5322, **(I.F.=5.231)**.
26. **Chemical modeling for predicting the abundances of certain aldimines and amines in hot cores**, Milan Sil, Prasanta Gorai, **Ankan Das**, Bratati Bhat, Emmanuel Etim & Sandip K. Chakrabarti, 2018, Astrophysical Journal, 853, 139 **(I.F.= 5.909)**.
27. **Theoretical Investigation of Interstellar C-C-O and C-O-C Bonding Backbone Molecules**, Emmanuel Etim, Prasanta Gorai, **Ankan Das** & E. Arunan, 2018, Astrophysics and Space Science, 363, 6 **(I.F.= 1.678)**.
28. **SH Stretching Vibration of Propanethiol Ice - A Signature for its Identification in the Interstellar Icy Mantles**, S. Pavithraa, D Sahu, J -I Lo, B N Raja Sekhar, B -M Cheng, **Ankan Das**, L Pirogov, N J Mason, B Sivaraman, 2017, Astrophysics and Space Science, 362, 126 **(I.F.=1.678)**.
29. **Interstellar Protonated Molecular Species**, Emmanuel E. Etim, Prasanta Gorai, **Ankan Das**, E. Arunan, 2017, Advances in Space Research, 60, 709 **(I.F. = 2.152)**.
30. **C5H9N Isomers: Pointers to Possible Branched Chain Interstellar Molecules**, Emmanuel E. Etim, Prasanta Gorai, **Ankan Das**, E. Arunan, 2017, European Journal of Physics D, 71, 86. **(I.F. = 1.33)**.
31. **The Possibility of Forming Propargyl Alcohol in the Interstellar Medium**, Prasanta Gorai, **Ankan Das**, Liton Majumdar, Bhalamurugan Sivaraman, Sandip K. Chakrabarti, Eric Herbst, 2017, Molecular Astrophysics, 6, 36. **(I.F. = 3.82).**
32. **Qualitative observation of reversible phase change in astrochemical ethanethiol ices using infrared spectroscopy**, S Pavithraa, R Rajan, P Gorai, J -I Lod, **Ankan Das**, B N Raja Sekhar, T Pradeep, B -M Cheng, N J Mason, B Sivaraman, 2017, Spectrochimica Acta Part A, 178, 166. **(I.F. = 4.098)**.
33. **Adsorption energies of H and H2: A Quantum-Chemical Study**, Milan Sil, Prasanta Gorai, **Ankan Das**, Sandip K. Chakrabarti, 2017, European Journal of Physics D, 71, 45.**(I.F. = 1.33)**
34. **Search for Interstellar Monohydric Thiols**, Prasanta Gorai, **Ankan Das**, Amaresh Das, Bhalamurugan Sivaraman, Emmanuel E. Etim, Sandip K. Chakrabarti, 2017, Astrophysical Journal, 836, 70. **(I.F. =5.58)**.
35. **Systematic Theoretical Study on the Interstellar Carbon Chain Molecules**, Emmanuel E. Etim, Prasanta Gorai, **Ankan Das**, Sandip K. Chakrabarti, E. Arunan, 2016, (Astrophysical Journal), 832, 144.**(I.F. = 5.58)**
36. **Deuterium enrichment of the interstellar grain mantle**, **Ankan Das**, Dipen Sahu, Liton Majumdar, Sandip K. Chakrabarti, 2016, MNRAS, 455,540 **(I.F. = 5.231)**
37. **Potential formation of three pyrimidine bases in interstellar regions**, Liton Majumdar, Prasanta Gorai, **Ankan Das**, Sandip K. Chakrabarti, 2015, Astrophysics and Space Science, 360, 64. **(I.F.=1.678)**

38. **Methyl Acetate and its singly deuterated isotopomers in the interstellar medium**, **Ankan Das**, Liton Majumdar, Dipen Sahu, Prasanta Gorai, B Sivaraman, Sandip K. Chakrabarti, 2015, Astrophysical Journal, 808, 21, **(I.F. = 5.58)**
39. **Search for Interstellar Adenine**, Sandip K. Chakrabarti, Liton Majumdar, **Ankan Das**, Sonali Chakrabarti, 2015, Astrophysics and Space Sciences, 357, 90 **(I.F. = 1.678)**
40. **Infrared Spectra and Chemical Abundance of Methyl Propionate in Icy Astrochemical Conditions**, B. Sivaraman, R. Narayanan, **Ankan Das**, G. Gopakumar, L. Majumdar, S. K. Chakrabarthi, K. P. Subramanian, B. N. Raja Sekhar, M. Hada, 2015, MNRAS, 448, 1372. **(I.F.=5.231)**
41. **Deuterium enrichment of the Interstellar Medium**, **Ankan Das**, Liton Majumdar, Sandip K. Chakrabarti, Dipen Sahu 2015, New Astronomy, 35, 53. **(I.F.=1.162)**
42. **Monte Carlo simulation to investigate the formation of molecular hydrogen and its deuterated forms**, Dipen Sahu, **Ankan Das**, Liton Majumdar, Sandip K. Chakrabarti, 2015, New Astronomy, 38, 23 **I.F. =1.162)**
43. **Formation of deuterated hydrogen molecules in the ISM**, Dipen Sahu, **Ankan Das**, 2015, Asian Journal of Physics, 24, 8
44. **Formation of different isotopomers of chloronium in the interstellar medium**, Liton Majumdar, **Ankan Das**, Sandip K. Chakrabarti, 2014, Astrophysical Journal, 782, 73.**(I.F.=5.58)**
45. **Spectroscopic characteristics of the cyanomethyl anion and its deuterated derivatives**, Liton Majumdar, **Ankan Das**, Sandip K. Chakrabarti, 2014, Astronomy and Astrophysics, 562, 56.**(I.F.=6.209)**
46. **Formation of Cyanoformaldehyde in the interstellar space**, **Ankan Das**, Liton Majumdar, Sandip K. Chakrabarti, Rajdeep Saha, Sonali Chakrabarti, 2013, MNRAS, 433, 3152. **(I.F.=5.231)**
47. **Study the chemical evolution and spectral signatures of some interstellar precursor molecules of adenine, glycine & alanine**, Liton Majumdar, **Ankan Das**, Sandip K. Chakrabarti, Sonali Chakrabarti, 2013, New Astronomy, 20, 15.**(I.F.=1.162)**
48. **Chemical evolution during the process of proto-star formation by considering a two dimensional hydrodynamical model**, **Ankan Das**, Liton Majumdar, Sandip K. Chakrabarti, Sonali Chakrabarti, 2013, New Astronomy, 23, 118.**(I.F.=1.162)**
49. **Hydro-Chemical study of the evolution of interstellar pre-biotic molecules during the collapse of molecular clouds**, Liton Majumdar, **Ankan Das**, Sandip K. Chakrabarti, Sonali Chakrabarti, 2012, Research in Astronomy and Astrophysics, 12, 1613.**(I.F.=6.209)**
50. **Composition and Evolution of Interstellar Grain Mantle under the effect of Photodissociation**, **Ankan Das** & Sandip K. Chakrabarti, 2011, MNRAS, 418, 545.**(I.F.=5.231)**
51. **Effects of Initial Condition and Cloud Density on the Composition of the Grain Mantle**, **Ankan Das**, Kinsuk Acharyya & Sandip K. Chakrabarti, 2010, MNRAS, 409, 789.**(I.F.=5.231)**
52. **Formation of Water and Methanol in Star Forming Molecular Clouds**, **Ankan Das**, Kinsuk Acharyya, Sonali Chakrabarti and Sandip K. Chakrabarti, 2008, Astronomy & Astrophysics, 486, 209.**(I.F.=6.209)**
53. **Time evolution of simple molecules during proto-star collapse**, **Ankan Das**, Sandip K. Chakrabarti, Kinsuk Acharyya, Sonali Chakrabarti, 2008, New Astronomy, 13, 457.**(I.F.=1.162)**
54. **Effective grain surface area in the formation of molecular hydrogen in interstellar**

clouds, Sandip K. Chakrabarti, **Ankan Das**, Kinsuk Acharyya, Sonali Chakrabarti, 2006, Astronomy & Astrophysics, 457, 167. **(I.F.=6.209)**

55. **Recombination efficiency of molecular hydrogen on interstellar grains-II. A numerical study**, Sandip K. Chakrabarti, **Ankan Das**, Kinsuk Acharyya, Sonali Chakrabarti, 2006, Bulletin of Astronomical Society of India, 34, 299. **(I.F.=0.704)**

Publication achievements:

1. Study of the chemical evolution and spectral signatures of some interstellar precursor molecules of adenine, glycine & alanine, published in 2013 in the New Astronomy Journal is one of the 5 most highly cited papers during 2014, 2015 and up until June 2016.
2. Chemical evolution during the process of proto-star formation by considering a two dimensional hydrodynamic model, published in 2013 in the New Astronomy Journal is one of the 5 most highly cited papers during 2014, 2015 and up until June 2016.

Other Publications:

1. **Phosphorus-bearing species in the interstellar medium**, Srivastav, Satyam; Sil, Milan; Bhat, Bratati; Mondal, Suman Kumar; Gorai, Prasanta; Ghosh, Rana; Shimonishi, Takashi; Chakrabarti, Sandip Kumar; Sivaraman, Bhalamurugan; Pathak, Amit; Nakatani, Naoki; Furuya, Kenji; Das, Ankan, 2022cosp...44.2811S
2. **Binding energy: a fundamental parameter to model interstellar chemistry**, Sil, Milan; Gorai, Prasanta; Loison, J. -C.; Ghosh, Rana; Chakrabarti, Sandip Kumar; Das, Ankan, 2022cosp...44.2808S
3. **Radiative transfer model to explain the observed line profiles of a hot molecular core, G31.41+0.31**, Bhat, Bratati; Gorai, Prasanta; Mondal, Suman Kumar; Chakrabarti, Sandip Kumar; Das, Ankan, 2022cosp...44.2750B
4. **Explore the existence of noble gas related species in the crab nebula filamentary region**, Das, Ankan; Sil, Milan; Bhat, Bratati; Gorai, Prasanta; Chakrabarti, Sandip Kumar; Caselli, Paola, 2022cosp...44.2748D
5. **Aldehydes and their corresponding alcohols in the interstellar medium**, Mondal, Suman Kumar; Gorai, Prasanta; Sil, Milan; Ghosh, Rana; Etim, Emmanuel; Chakrabarti, Sandip Kumar; Shimonishi, Takashi; Nakatani, Naoki; Furuya, Kenji; Tan, Jonathan; Das, Ankan, 2022cosp...44.2739M
6. **Complex molecules in Star forming Regions**, Ankan Das, 2015, **Planex**, Volume 5, Issue 4, Page 11-15
7. **Explaining the deuterium fractionation of Water: Modelling and observations**, Sahu, D., Chakrabarti, S K., Das, Ankan; Majumdar, Liton , 2014cosp,40E2842
8. **Effective formation of simple molecules like H2, D2, HD on grain surfaces and various consequences**, Sahu, Dipen; Chakrabarti, Sandip Kumar; Das, Ankan; Majumdar, Liton , 2014cosp,40E2841
9. **On the detection of different chlorine bearing molecules in ISM through Herschel/HIFI**, Majumdar, Liton; Chakrabarti, Sandip Kumar; Das, Ankan , 2014cosp,40E1949
10. **Existence of some pre-biotic molecules in and around the Interstellar Medium**, Majumdar, Liton; Chakrabarti, Sandip Kumar; Das, Ankan; Chakrabarti, Sonali 2014cosp,40E1948
11. **Physics and Chemistry on interstellar dust**, Majumdar, Liton; Chakrabarti, Sandip

Kumar; Das, Ankan , 2014cosp,40E1947

12. **Chemical evolution of life making molecules in extreme environments**, Majumdar, Liton; Chakrabarti, Sandip Kumar; Das, Ankan; Chakrabarti, Sonali , 2014cosp,40E1946
13. **Structure, spectroscopy and chemistry on interstellar dust**, Majumdar, Liton; Chakrabarti, Sandip Kumar; Das, Ankan , 2014cosp,40E1945
14. **Chemical composition of interstellar dust**, Das, Ankan; Chakrabarti, Sandip Kumar; Majumdar, Liton; Sahu, Dipen , 2014cosp,40E.625
15. **Co-relation of the degree of Ionization of a molecular cloud with the depletion of the neutral species on the interstellar dust**, Das, Ankan; Chakrabarti, Sandip Kumar; Majumdar, Liton; Sahu, Dipen , 2014cosp,40E.624
16. **Methanol formation around the star forming region**, Ankan Das, Sandip K. Chakrabarti, Kinsuk Acharyya, Sonali Chakrabarti 2013, AIP Conf. Proc., 1543, 221.
17. **A Monte-Carlo Simulation of the Production of Hydrogen Molecules on Grain Surfaces**, Ankan Das, Sandip K. Chakrabarti, Kinsuk Acharyya, Sonali Chakrabarti, Proceedings of ASTROCHEM2012, 2013, AIP Conf. Proc., 1543, 228.
18. **Monte Carlo Simulation for the formation of Interstellar Grain Mantle**, Ankan Das, Sandip K. Chakrabarti, Proceedings of ASTROCHEM2012, 2013, AIP Conf. Proc., 1543, 210.
19. **A 2D hydrodynamic simulation coupled to chemical evolution around star forming region: A time dependent study**, Liton Majumdar, Ankan Das, Sandip K. Chakrabarti, Sonali Chakrabarti, Proceedings of ASTROCHEM2012, 2013, AIP Conf. Proc., 1543, 242.
20. **Quantum Chemical approach to study the spectral properties of some important precursor of bio-molecules**, Liton Majumdar, Ankan Das, Sandip K. Chakrabarti, Sonali Chakrabarti, Proceedings of ASTROCHEM2012, 2013, AIP Conf. Proc., 1543, 266.
21. **Formation of the nucleobases around the Star forming region**, Rajdeep Saha, Liton Majumdar, Ankan Das, Sandip K. Chakrabarti, Sonali Chakrabarti, Proceedings of ASTROCHEM2012, 2013, AIP Conf. Proc., 1543, 251.
22. **Role of Ambipolar Diffusion towards the chemical evolution of molecular cloud**, Dipen Sahu, Ankan Das, Liton Majumdar, Sandip K. Chakrabarti, 2013, AIP Conf. Proc., 1543, 236.
23. **Effect of photo-dissociation on the composition of the grain mantle** Saha, Rajdeep; Chakrabarti, Sandip Kumar; Das, Ankan; Majumdar, Liton; Chakrabarti, Sonali , 2012cosp,39.1647S
24. **A quantum chemical approach to set a guideline for the observation of different pre-biotic molecules in the interstellar space**, Majumdar, Liton; Chakrabarti, Sandip Kumar; Das, Ankan; Chakrabarti, Sonali , 2012cosp,39.1154
25. **Formation of some of the bases of DNA in the interstellar space during the molecular cloud collapse**, Majumdar, Liton; Chakrabarti, Sandip Kumar; Das, Ankan; Chakrabarti, Sonali , 2012cosp,39.1153
26. **Spectral signature and chemical evolution of some complex molecules which could be treated as the precursor of some bio-molecules in the ISM**, Majumdar, Liton; Chakrabarti, Sandip Kumar; Das, Ankan; Chakrabarti, Sonali , 2012cosp,39.1152
27. **Chemical Composition of Interstellar Dust: A Monte Carlo Study**, Das, Ankan; Chakrabarti, Sandip Kumar , 2012cosp,39..399
28. **A Monte Carlo Study to Explore the Composition of the Grain Mantle**, Das,

Ankan; Chakrabarti, Sandip Kumar , 2012cosp,39..398
29. **Synthesis of prebiotic molecules and origin of life**, Chakrabarti, Sandip Kumar; Das, Ankan; Majumdar, Liton; Chakrabarti, Sonali , 2012cosp,39..289
30. **A 2D hydrodynamic simulation coupled with the chemical evolution to study the physics and Chemistry of the ISM**, Chakrabarti, Sandip Kumar; Das, Ankan; Majumdar, Liton; Chakrabarti, Sonali , 2012cosp,39..288
31. **Composition of Grain Mantle; A Monte Carlo Study**, Ankan Das Sandip K. Chakrabarti, 2011, IAUS, 280P, 399
32. **Chemical Evolution around star forming region: A time dependent study** Liton Majumdar, Ankan Das, Sandip K. Chakrabarti, Sonali Chakrabarti, 2011, IAUS, 280P, 400
33. **A systematic laboratory study of interstellar water ice containing O_2, N_2, CO and CO_2**, Ankan Das, Karoliina isokoski, Zainab Awad, Ewine F. Van Dishoeck and Harold Linnartz, 2009, 42^{nd} IUPAC congress(in press).
34. **Methanol Formation: A Monte Carlo Study**, Ankan Das, Kinsuk Acharyya, Sonali Chakrabarti, Sandip K. Chakrabarti, 2008, International Astronomical Union, 251, 2132.
35. **Formation of Water and Methanol in Star Forming Molecular Clouds**, Sonali Chakrabarti, Ankan Das, Kinsuk Acharyya, Sandip K. Chakrabarti, 2008, Origin of Life and Evolution of Biosphere;XV International Conference on the Origin of Life.
36. **Monte-Carlo simulation of Molecular Hydrogen Formation on Grain Surfaces**, Sandip K. Chakrabarti, Ankan Das, Kinsuk Acharyya, Sonali Chakrabarti, 2006, Bulletin of Astronomical Society of India, 33, 390.
37. **Recombination efficiency of molecular hydrogen on interstellar grains-II. A numerical study**, Sandip K. Chakrabarti, Ankan Das, Kinsuk Acharyya, Sonali Chakrabarti, 2006, IC2006030.
38. **Average recombination time of atomic hydrogen on grain surfaces: A Monte Carlo study**, Ankan Das, Sandip K. Chakrabarti, Kinsuk Acharyya, Sonali Chakrabarti, 2006, Cospar, 36, 623.
39. **Time dependent chemical evolution of molecular clouds**, Ankan Das, Sandip K., Chakrabarti, Kinsuk Acharyya, Sonali Chakrabarti, 2006, Faraday Discussion, 133, 82.
40. **Production of complex bio-molecules in collapsing interstellar cloud**, Kinsuk Acharyya, Sandip K. Chakrabarti, Sonali Chakrabarti, Ankan Das, 2005, International Astronomical Union, 235, 196.

Publications in Magazines:

1. **Tarar Janmo** in Mahabiswa o Ami, 2004.
2. **Groho ebong grhanupunjo** in Mahabiswa o Ami, 2005.
3. **Global Warming** in Mahabiswa o Ami, 2006.
4. **Space Tourism** in Mahabiswa o Ami, 2007.

Science fiction story:

1. Aguntuk (Link 1, Link 2)
2. Gobeshonar Ontorale (Link)

News Media:

1. Live expert comments on chandrayaan 3 (7:00 pm - 8:00 pm 23^{rd} August, 2023) in TV channel 'ABP Ananda' .
2. Live expert comments on the great conjunction (21, December 2020) in TV channel 'News18 Bangla'
3. Live expert comments on solar eclipse on India (20, June 2020) in TV channel 'News18 Bangla'
4. Live expert comments on Space X (31^{st}, May 2020) in TV channel 'News18 Bangla'
5. Live expert comments on annular solar eclipse on India (11 - 12 am, 26^{th} December, 2019) in TV channel 'ABP Ananda' .
6. Live expert comments on chandrayaan 2 (10:00 pm - 1:00 am $6-7^{th}$ September, 2019) in TV channel 'ABP Ananda' .
7. Hydrogen Bonding: From Biological Systems To Interstellar Medium published in science trends on 5^{th} July 2018 (https://sciencetrends.com/hydrogen-bonding-from-biological-systems-to-interstellar-medium/).
8. Live expert comments on Supermoon (6:30-7:00pm, 14^{th} November, 2016) in TV channel 'ETV Bangla News' .
9. Recreating astronomical ices on earth published in Nature India, doi: 10.1038/ nindia.2017.37, 27^{th} February, 2017 based on the work published in Spectrochim. Acta. Mol. Biomol. Spectros.178,166-170 (2017).
10. Wrote one aricle entitled E kon Akashbani? Mahakash theke Ke Pathalo 72 seconder Barta, in Anandabazar Patrika online edition, 22^{nd} April, 2016.
11. Published one interview on Mahakashe Millo Chini, Praner Spashto ingit, Bolchen Bigganira in Anandabazar Patrika online Edition, 20^{th} February, 2016.
12. Space recipe for life-making molecules published in Nature India, doi:10.1038/ nindia.2013.28, 20^{th} February, 2013 based on the work published in New Astron. 20, 15-23 (2013).
13. Heavier hydrogen unveils secrets of protostars published in Nature India, doi: 10.1038/ nindia.2014.155, 17^{th} November, 2014 based on the work published in New. Astron. 35, 53-70 (2014) .
14. Life in a grain of cosmic dust published in Nature India, doi: 10.1038/ nindia.2008.243, 18^{th} July, 2008 based on the work published in Astron. Astrophys. 486, 209-220 (2008)

Session chaired:

1. chairman of a session in the International Workshop on Chemical evolution and origin of Life, 21^{st}-23^{rd} March 2013, IIT Roorkee, India.
2. chairman of a session in the International Workshop on Chemical evolution and origin of Life, 5-7^{th} March 2010, IIT Roorkee, India.

Invited Lecture:

1. **Astrochemical model to explain the chemical diversity of molecular clouds.**, colloquium at Chalmers Institute of Technology, 1^{st} February, 2023.
2. **Explaining the chemical diversity of molecular clouds**, colloquium at National Observatory of Japan, 1^{st} September, 2022.
3. **Are we alone in the Universe?**, One day National level Webinar on Space Science, Astronomy club and IQAC-Vevekananda College, 11^{th} January, 2022.
4. **Are we all made up of stardust?**, 21 st webinar of JBNSTS & Vigyan Prasar, 13^{th} August, 2021.
5. **How Biomolecules are forming in space?**, Astrobiology webinar 10, PRL, 11^{th} August, 2020.
6. **The Role of Interstellar dust on the formation of Complex Organic Molecules**, Max Planck Institute for extraterrestrial Physics, Garching, Germany, 11^{th} March, 2019.
7. **Astrochemistry - from Theory to Observations**, an introductory talk at the Astrochemistry session, INYAS-FOS Brainstorming Meeting, December 09-11, 2018
8. **Astrochemical modeling to explain the presence of complex organic molecules in space**, International COnference on Astrobiology, 15^{th} December, 2018, Pune, India.
9. **Astrochemical model of Titan atmosphere**, Cassini-Hygens@PRL, 13^{th} september 2017, PRL, Ahmedabad, India.
10. **Chemical composition of the Interstellar medium, TMT meeting, 2^{nd} December, 2015, Tezpur University, Tezpur, India**
11. **Astrochemistry of Pluto** in New Horizons@PRL, 14^{th} July, 2015, PRL, Ahmedabad, India
12. **Chemical composition of the Interstellar Molecular cloud, 25th November 2013, PRL, Ahmedabad, India**
13. **Chemical evolution of the ISM** in International Workshop on Chemical Evolution and Origin of Life, 6^{th} March, 2010, IIT Roorkee, India.
14. **Deuterium enrichment of the ISM** in International Workshop on Chemical Evolution and Origin of Life, $21^{st} - 23^{rd}$ March, 2013, IIT Roorkee, India.

Oral presentation:

1. **Peptide-like bond containing molecules in a hot molecular core, G10.47+0.03, and their chemical origin**, COSPAR 2021, 1^{st} February, 2021 virtual conference Sydney.
2. **How Biomolecules are forming in space?**, Astrobiology webinar 10, PRL, 11^{th} August, 2020.
3. **Astrochemical modeling in explaining the observational aspects**, Exploring the Universe: Near Earth space science to extragalactic astronomy" will be held in November 14-17, 2018, at S. N. Bose National Centre for Basic Sciences, Kolkata, India.
4. **Importance of interstellar dust for the formation of complex molecules in hot cores**, 16^{th} August 2018, 11^{th} Cosmic Dust mneeting, JAXA, Sagamihara, Japan.
5. **A Theoretical Prediction of the Abundances of Interstellar Pre-biotic molecules**, 21^{st} July 2018, F3.5 session of COSPAR 2018, Pasadena, CA, USA.
6. **Deuteration of the Interstellar medium**, 15^{th} July 2018, B0.1 session of COSPAR 2018,

Pasadena, CA, USA.

7. **Deuterium enrichment of the ISM**, 31^{st} October 2017, Astrochemistry in the THz domain, Chennai, India.
8. **Complex deuterated species in the Interstellar medium**, 18^{th} July, 2017, Current and future perspective of chemical modeling in Astrophysics, University of Hamburg, Germany.
9. **Monte Carlo simulation to investigate the formation of various deuterated species on interstellar dusts**, 6^{th} May, 2015, Paris, France.
10. **Chemical composition of interstellar dust**, 5th August 2014, B0.5 COSPAR, Moscow, Russia.
11. **Co-relation of the degree of Ionization of a molecular cloud with the depletion of the neutral species on the interstellar dust**, 5th August 2014, B0.5 COSPAR, Moscow, Russia.
12. **Modeling of Interstellar Gas-Grain Chemistry and study the spectral properties of some important Interstellar species**, 1st April 2014, Ranchi, India.
13. **Origin of Life**, Golden Jubilee Celebration Panchberia Sunrise Club, Panchberia, Midnapore(W), popular lecture, 25th January, 2014, Khukurdaha, Midnapur, West Bengal, India.
14. **Chemical composition of the interstellar dust and deuterium enrichment of the ISM** Light Scattering techniques and application to Astronomy and other areas, 19-21^{st}, November, 2013, S. N. Bose National Centre for Basic Sciences, Kolkata, India.
15. **A Monte Carlo Study to Explore the Composition of the Grain Mantle** in F3.5 session of COSPAR during 15-21^{st} July, 2012, Mysore, India.
16. **Chemical Composition of Interstellar Dust:A Monte Carlo Study** in B0.5 session of COSPAR during 15-21^{st} July, 2012, Mysore, India.
17. **Study of the Interstellar processes leading to the deuterium enrichment** in 'ISRO Respond meeting', 28-29^{th} February 2012, PRL, Ahmedabad, India.
18. **Monte Carlo Simulation for the formation of interstellar grain mantle** 10-13^{th} july, 2012, ASTROCHEM 2012, S.N.Bose National Centre for Basic Sciences, Kolkata, India.
19. **Chemical Composition of the interstellar grain mantle under the effect of physical parameters** 23^{rd} November, 2011, IDMC 2011, IUCAA, Pune, India.
20. **Study of the Interstellar processes leading to the deuterium enrichment** in 'ISRO Respond meeting', 29-31^{st} March 2011, PRL, Ahmedabad, India.
21. **Chemical evolution of the ISM** in International Workshop on Chemical Evolution and Origin of Life, 6^{th} March, 2010, IIT Roorkee, India.
22. **Study of grain chemistry in relation to the formation of interstellar molecules** in '65^{th} Astro-Surfsci Discussion meeting', 4^{rd} April 2009, Leiden University, Netherlands.
23. **Chemical evolution of molecular cloud** in 'Our Astronomy/Astrophysics - A critical appraisal' at Indian Centre for Space Physics, 16^{th} November 2008, Kolkata, India.
24. **Formation of protostars and chemical evolution in these processes** in 'Departmental Seminar of Calcutta University', 24^{th} April 2008, Calcutta University, West Bengal, India.
25. **Formation of Methanol and Water in the ISM** in 'Chemical Evolution and Origin of Life', 14-16^{th} March 2008, IIT Roorkee, Uttarakhand, India.
26. **Study of grain chemistry in relation to the formation of complex molecules in collapsing molecular cloud** in 'ISRO Respond meeting', 23-24^{th} March 2007, PRL, Ahmedabad, India.

27. **Search for life** in 'District-wise Space Science Symposium', February, 2007, Murshidabad, West Bengal, India.
28. **Space Tourism** in 'District-wise Space Science Symposium' , 17th January, 2008, Krishnanagar, West Bengal, India.
29. **Origin of life** in 'District-wise Space Science Symposium' , May 18^{th} 2007, Birbhum, West Bengal, India.
30. **Origin of life** in 'District-wise Space Science Symposium' , May 17^{th} 2007, Burdwan, West Bengal, India.
31. **Planet detection** in 'District-wise Space Science Symposium' , February 3^{rd} 2005, Bakura, West Bengal, India.
32. **Origin of life** in 'District-wise Space Science Symposium' , February 3^{rd} 2005, Purulia, West Bengal, India.
33. **Evolution of the universe** in 'inaugural ceremony of Centre For Space Physics branch in Malda', West Bengal, India.

Poster presentation:

1. Presented various posters in the virtual COSPAR 2021, Sydney, Australia
2. Presented various posters in COSPAR 2018, Pasadena, CA.
3. **The Possibility of Forming Propargyl Alcohol in the Interstellar Medium** in Current and Future Perspectives of Chemical Modeling in Astrophysics. $17^{th} - 19^{th}$ July, 2017, University of Hamburg, Germany.
4. **Chemical evolution and Spectroscopy of some complex molecules which could be treated as the precursor of some bio-molecules in the Interstellar Medium** in IAUS 292 session in XXVIIIth General Assembly, 20^{th} May - 31^{st} August 2012, Beijing, China.
5. Composition of Grain Mantle; A Monte Carlo Study in XXVIII IAU General Assembly 20^{th} May - 31^{st} August 2012, Beijing, China.
6. **Chemical Composition of the Interstellar Grain Mantle** in XXVIII IAU General Assembly sps16 20^{th} May - 31^{st} August 2012, Beijing, China.
7. **Composition of Grain Mantle; A Monte Carlo Study** in IAU 280 Symposium,29^{th} May - 3^{rd} June 2011, Toledo, Spain.
8. **Chemical evolution around star forming region: A time dependent study** in IAU 280 symposium , 29^{th} May - 3^{rd} June 2011, Toledo, Spain.
9. **A systematic laboratory study of interstellar water ice containing O_2, N_2, CO and CO_2** in 42^{nd} IUPAC congress, 2-7^{th} August 2009, Glasgow, UK.
10. **A systematic laboratory study of polluted interstellar water ice analogues** in NAC 2009: 64^{th} Dutch Astronomy Conference, 13-15^{th}th May 2009, Kerkrade, Zuid-Limburg, Netherlands.
11. **Formation of Methanol in the ISM** in IAU Symposium 251:Organic Matter in Space, 18-22^{th} February 2008, Hong Kong, China.
12. **A Monte-Carlo simulation of the production of hydrogen molecules on grain surfaces** in National Space Science Symposium, 26-29^{th} February 2008, Ooty, India.
13. **Time dependent chemical evolution of molecular cloud** in Faraday Discussion 133:

Chemical Evolution of the Universe, 24-26th April 2006,St Jacut de la Mer, Brittany,France.

14. **A Monte-Carlo simulation of the production of hydrogen molecules on grain surfaces** in Faraday Discussion 133: Chemical Evolution of the Universe, 24-26th April 2006,St Jacut de la Mer, Brittany,France.
15. **Can amino acids be formed during the evolution of molecular cloud?** in Faraday Discussion 133: Chemical Evolution of the Universe, 24-26th April 2006, St Jacut de la Mer, Brittany,France.
16. **Time dependent chemical evolution of molecular cloud** Complex Molecules in Space Present status and prospects with ALMA, 8–11th May 2006, Fuglsøcentret, Denmark.
17. **A Monte-Carlo simulation of the production of hydrogen molecules on grain surfaces** in Complex Molecules in Space Present status and prospects with ALMA, 8–11th May 2006, Fuglsøcentret, Denmark.
18. **Can amino acids be formed during the evolution of molecular cloud?** in Complex Molecules in Space Present status and prospects with ALMA, 8–11th May 2006, Fuglsøcentret, Denmark.
19. **Production of complex bio-molecules in collapsing interstellar cloud** in IAU symposium 231:Recent success and current challenges, 29th August to 2nd September, Asilomar, USA.
20. **Monte-Carlo simulation of Molecular Hydrogen Formation on Grain Surfaces** in Astronomical Society of India meeting, February 21-24th February 2005, Nainital, India.

Seminars, Schools, Conferences, meeting Attended and academic visits:

1. **Scientific visit to Prof. Paola Caselli of Max Planck Institute for extraterrestrial Physics**, Garching during 1st December, 2022 - 1st March, 2023.
2. **Scientific visit to Dr. Takashi Shimonishi of Niigata University, Japan and Dr. Kenji Furya of National Observatory of Japan**, during 28th August-26th September, 2022.
3. **Scientific visit to Prof. Paola Caselli of Max Planck Institute for extraterrestrial Physics**, Garching during 10-17th March, 2019.
4. **Attended the International Conference on Astrobiology**, Pune, India during 15-16th December, 2018.
5. **Attended The 11th meeting on Cosmic dust**, 13-17 August, 2018, JAXA, Sagamihara, Japan.
6. **Attended 42nd COSPAR Assembly**, 14-22 July, 2018, Pasadena, CA, USA
7. **Visited National Synchrotron Radiation Research Centre**, Taiwan during 5th May-1st June 2018 for experiment.
8. **Astrochemistry in the THz domain**, 30-31st October, 2017, Chennai, India.
9. **Cassini-Hygens@PRL**, 13th September 2017, PRL, India
10. **Current and Future Perspectives of Chemical Modeling in Astrophysics**, 17-19th July, 2017, University of Hamburg, Germany.
11. Visited **Physical Research Laboratory**, Ahmedabad, India 8-10th September, 2016.
12. Visited **Indian Institute of Science**, Bangalore, India, 16-17th October, 2016.

13. **TMT meeting, 1-3 December, 2015, Tezpur University, Tezpur, India**.
14. **New Horizons @ PRL**, 14^{th} July, 2015, PRL, Ahmedabad, India.
15. **Intel HPC Code Modernization (Parallelization) Workshop**, 20^{th} August, 2015, SNBNCBS, Kolkata, India.
16. **KIDA 2015**, 5-7^{th} May 2015, Paris, France.
17. **ISRO Respond meeting**, 12-13^{th} March 2015, PRL, Ahmedabad, India.
18. **COSPAR 2014**,2-10^{st} August 2014, Moscow, Russia.
19. **DST meeting**,1^{st} April 2014, BIT, MESRA, Ranchi, India.
20. **ISRO Respond meeting**, 20-21^{st} February 2014, PRL, Ahmedabad, India
21. **VAMDC meeting**, 21-22^{nd} November, 2013, St Laurn Towers, Ahmedabad, India.
22. **Light Scattering techniques and application to Astronomy and other areas**, 19-21^{st}, November, 2013, S. N. Bose National Centre for Basic Sciences, Kolkata, India.
23. **XXVIII IAU General Assembly**, 20-31^{st} August 2012, Beijing China
24. **COSPAR 2012**,15-21^{st} July 2012, Mysore, India.
25. **Chemical Evolution of the Star Forming Region and the Origin of Life**, 10-13th July 2012 at S. N. Bose National Centre for Basic Sciences, Kolkata, India.
26. **Celebration of International Year of Chemistry-2011 Current Trends in Chemical Research**, 24^{th} june 2011, RKM, Narendrapur, India
27. **IDMC 2011**, 21-23^{rd} November, IUCAA, Pune, India
28. **IAU symposium 280:Molecular Universe**, 29^{th} May - 3^{rd} June 2011, Toledo, Spain
29. **ISRO Respond meeting**, 29-31^{st} March 2011, PRL, Ahmedabad, India
30. **International Workshop on Chemical Evolution and Origin of Life** , 5-7^{th} March 2010, IIT Roorkee, India
31. **42^{nd} IUPAC congress**,2-7^{th} August, Glasgow, UK.
32. **NAC 2009: 64^{th} Dutch Astronomy Conference**, 13-15^{th} May 2009, Kerkrade, Zuid-Limburg, Netherlands.
33. **Chemical Evolution and Origin of Life**, 14-16^{th} March, 2008, IIT Roorkee, Uttarakhand, India.
34. **Organic Matter in Space**, 18-22^{nd} February, 2008, Hong Kong, China.
35. **International advanced School on Space Weather** 2 - 19^{th} May 2006,The Abdus Salam International Centre for Theoretical Physics - Trieste, Italy.
36. **Faraday Discussion 133: Chemical Evolution of the Universe** 24-26^{th} April 2006,St Jacut de la Mer, Brittany,France.
37. **Astronomical Society of India meeting,** 21-24^{th} February 2005, Nainital, India.
38. **District-wise Space Science Symposium,** 2^{nd} February 2008, Murshidabad, West Bengal, India.
39. **District-wise Space Science Symposium,** 2^{nd} February 2008, Krishnanagar, West Bengal, India.
40. **District-wise Space Science Symposium,** 17^{th} May, 2007, Burdwan, West Bengal, India.
41. **District-wise Space Science Symposium,** 18^{th} May 2007, Birbhum, West Bengal, India.
42. **District-wise Space Science Symposium,** 2^{nd} February 2006, Siliguri, West Bengal, India.
43. **District-wise Space Science Symposium,** 2^{nd} February 2005, Bankura, West Bengal,

India.

44. **District-wise Space Science Symposium ,** 3^{rd} February 2005, Purulia, West Bengal, India.
45. **District-wise Space Science Symposium ,** February 2004, Kuchbihar, West Bengal, India.
46. **State Wise Telescope Making Workshop,** 2-8^{th} June 2003, Salt Lake, Kolkata, India.