

Curriculum Vitae of Dr. Sonali Chakrabarti

Born: Apr. 8th 1965 in Calcutta (WB), INDIA.

Marital Status: Married

Nationality: Indian

Present Address:

Dr. Sonali Chakrabarti

10A, 4Sight Impression, Ganguly Group

7 South Middle Fartabad, Garia, Kolkata 700084

Academic Affiliations:

Associate Professor, Maharaja Manindra Chandra College

20 Ramkanto Bose St., Kolkata 700003

Tel: 033-2555-4562

Honorary posts:

Honorary Professor, Indian Centre for Space Physics

466 Barakhola, Netai Nagar, Kolkata 700099

e-mail: sonalisandip63@gmail.com; sonali@csp.res.in

Education:

Secondary Examination: CBSE board, 1st division with 76% marks (1980)

Higher Secondary Examination: WB board of higher secondary education, 1st division with 79.8% marks (1982)

Bachelor of Science: (B.Sc.) in Physics (Hons.) from Calcutta University in 1985.

Position held: First Class Second with 74.8% marks

Master of Science (M.Sc.) in Physics from University College of Science, Calcutta in 1987. Position held: First Class third with 73% marks

Ph. D. in Physics on 'Studies on Diffraction Gratings in Microwave and Millimeter wave bands' from Jadavpur University, Calcutta in 1996.

Awards:

First Class Second in B.Sc. (Physics Hons.)

First Class Third in M.Sc. (Physics)

Qualified in NET examination (UGC-CSIR) of 1988, held on 22/1/89. All India Basis Rank 16th

Junior Research Fellowship of CSIR (Council of Scientific and Industrial Research):

1989-1991

Dr. S.C. Sengupta Memorial Award for becoming 1st in BA/BSc combined in Lady Brabourne College

H. Mustafa Memorial Award for becoming 1st in Science stream in Lady Brabourne College

Member (1996-1997): American Astronomical Society

Research Associateship of CSIR at S.N. Bose National Centre for Basic Sciences 11/1998-11/99 *Life Member (1999-):* Indian Centre for Space Physics and Indian Physical Society

Associate Member (2008-2009): International Society of Study of Origin of Life (ISSOL)

Citation from new Astronomy (2016): Adjudged for Highly Cited Research in New Astronomy Journal (Netherlands) for the paper Study of the chemical evolution and spectral signatures of some interstellar precursor molecules of adenine, glycine & alanine, New Astronomy, 20, 15 (2013)

Research and Teaching Experiences:

(a) Research Scholar at Indian Institute of Chemical Biology, Sept. 1989 - Aug. 1991. Work was carried out on mathematical modelling of various biological systems.

(b) Lecturer at St. Xavier's college and Jai Hind college in Mumbai (1992-1993)

(c) Worked on the 'Studies on Diffraction Gratings in Microwave and Millimeter wave bands'

(d) Visited International Center for Theoretical Physics (Trieste, Italy) in from August 1st to September 7th, 1993.

(e) Visited Arecibo Radio Observatory (Puerto Rico) in February, 1995.

(f) Part-time Lecturer at East Calcutta Girl's College (11/1997- 11/1998).

(g) Honorary lecturer in Physics at East Calcutta Girl's college (12/1998-2/1999)

(h) Research Associate at S.N. Bose National Centre for Basic Sciences, under the project 'Search for Pre-biotic Molecules in Space' (funded by Council of Scientific and Industrial Research, New Delhi) (11/1998).

(i) *Lecturer*, Maharaja Manindra Chandra College 12/99-11/2003 (scale: 8000-275-13500)

(j) *Scientist (Hony.)*, Indian Centre for Space Physics (2000-2006)

(j) Taken successfully three Refresher Courses from Jadavpur University

(k) *Senior Grade Lecturer*, Maharaja Manindra Chandra College; 12/2003- continuing; (scale: 10000-325-15200)

(l) *Reader (Hony.)*, Indian Centre for Space Physics (2006-2011)

(m) *Assoc. Prof. (Hony.)*, Indian Centre for Space Physics (2011-2017)

(n) *Professor (Hony.)*, Indian Centre for Space Physics (2017-)

Research Publications:

(A) In Journals and Proceedings:

1. Intensity Distribution of the Diffracted Waves by Echelette Reflection Grating in Optical and Microwave Regions, by S. Chakrabarti and J.N. Chakravorty, *Indian J. Physics*, **66B** (4), 397, 1992.
2. On the Theory of Optical and Microwave Diffraction by Echelon Reflection Gratings, by S. Chakrabarti and J.N. Chakravorty, *Indian J. Phys.*, **67B**,(1), 39, 1993
3. On the Theory of Diffracted Waves by Transmission Echelon grating in Optical and Quasi-optical Millimeter Wave region, by Chakrabarti and Chakravorty, *Indian J. Phys.*, **67B**, (5), 375, 1993
4. On the Fabrication and uses of Quasi-optical millimeter wave Diffraction gratings — A comparative study, by S. Chakrabarti and J.N. Chakravorty, *J. of Optics*, **22**,(4), 119, 1993
5. On the Optimum Intensity Response in the Quasi-optical Millimeter Wave band for a Transmission Echelon Grating, by S. Chakrabarti, *Indian J. Phys.*, **68B**,(1), 57, 1994
6. Theoretical Study for the Optimum Intensity and the Diffraction Efficiency Response for the Echelle Reflection Grating in the Microwave Region, by S. Chakrabarti and J.N. Chakravorty, *Optics Communications*, **107**, 184, 1994
7. Intensity of Waves diffracted from Symmetrical Profile Lamellar Gratings, by S. Chakrabarti and J.N. Chakravorty, *Astrophys. and Space Science*, **209**, 99, 1993
8. Variable Blaze Angle Echelette Reflection Grating in Quasi-optical Millimeter Wave region, by S. Chakrabarti and J.N. Chakravorty, *Optical Engg.*, **34**(4), 1105, 1995
9. Reflection Echelon and Echelette Gratings as Antennas in Quasi-optical Millimeter Wave Bands, by S. Chakrabarti, K. Goswami, and J.N. Chakravorty and A.K. Sen, *Indian J. of Physics*, **68B**(5), 399, 1994
10. Millimeter Wave Diffraction Gratings in Instantaneous Frequency Measurement (IFM) Receivers, by S. Chakrabarti and J.N. Chakravorty , *J. Optics (India)*, 24(1), 45, 1994
11. Studies of the Intensity Distribution of a Number of Phase Gratings, S. Chakrabarti, *Bulletin of the American Astronomical Society*, **27**, 773, 1995
12. Studies on Blazed Echelettes and Special Profile Lamellar Gratings for the Millimeter Wave Band, S. Chakrabarti, *Physics Teacher*, **36**, 104, 1994
13. A Theoretical Comparison of energy available for DNA damage by electromagnetic radiation and metabolic processes, S. Chakrabarti, *Indian Journal of Physics*, 1999, 73B, 417
14. Search for prebiotic molecules in space, S. Chakrabarti, *Indian Journal of Physics*, in *Proceedings of Young Astrophysicists of Today's India*, 73B(6), 991, 1999
15. Can DNA bases be produced during molecular cloud collapse? by S. Chakrabarti & S.K. Chakrabarti, 2000, *Astronomy & Astrophysics Letters*, 354, L6-L8
16. Adenine Abundance in a Collapsing Molecular Cloud , S.K. Chakrabarti & S.

- Chakrabarti, 2000, *Ind. J. Phys.*, 74B, 97
17. Millimeter wave reflection grating antenna in radar technology, S. Chakrabarti & J.N. Chakravorty, 2000, 74B, 287
 18. VLF observation during Leonid Meteor Shower-2002 from Kolkata (India), S. K. Chakrabarti, S. Pal, K. Acharya, S. Mandal, S. Chakrabarti, R. Khan, B. Bose, 2002, *Ind. J. Phys.* 76B, 693
 19. On the Possibility of Formation of Organic Molecules during star formation, K. Acharya, S. Chakrabarti and S.K. Chakrabarti, 2002, Proceedings of the National Space Science Symposium, (Bhopal), 380
 20. Can Bio-Molecules be formed in Collapsing Interstellar Clouds? S.K. Chakrabarti and S. Chakrabarti, 2001, Proceedings of conference 'First Steps in the Origin of Life', Ed. J. Chela Flores, 2001,
 21. Formation of Biomolecules During Star Formation, Kinsuk Acharyya, Sandip K. Chakrabarti and Sonali Chakrabarti, 2003, in 'Recent Trends of Astro and Plasma Physics in India', p. 259 (CSP:India).
 22. Fate of Glycine During Collapse of Interstellar Clouds and Star Formation, 2004, S.K. Chakrabarti, S. Chakrabarti, K. Acharyya in 'Life in the Universe' Eds. J. Seckbach (Kluwer:Holland)
 23. Formation Simple Bio-Molecules During Collapse of an Interstellar Cloud, 2004, K. Acharyya, S. K. Chakrabarti and S. Chakrabarti in 'Life in the Universe' Eds. J. Seckbach (Kluwer:Holland)
 24. Formation of Simple Bio-Molecules During Collapse of a Interstellar Cloud – A Preliminary Analysis, 2004, K. Acharyya, S. Chakrabarti and S.K. Chakrabarti, *Indian. J. Physics*, 78B(2), 7
 25. Studies on Microwave Lamellar Reflection Gratings, 2004, S. Chakrabarti, S. Chatterjee, U. Chattopadhyay and J.N. Chakravorty, *Ind. J. Physics*, 78(6), 431
 26. Theoretical Study of Waves diffracted from Asymmetrical Profile lamellar gratings, 2004, S. Chakrabarti, S. Chatterjee, U. Chattopadhyay and J.N. Chakravorty, *I. J. Physics*, 78(6), 471
 27. Formation of Simplest Bio-Molecules During Collapse of an Interstellar Cloud K. Acharyya, S.K. Chakrabarti and S. Chakrabarti, 2005, in Proceedings of 'Life in the Universe' Ed. J. Seckbach, Chela-Flores, J., Owen, T. and Raulin, F. (Eds.), Kluwar Publications 195
 28. Fate of Glycine During Collapse of Interstellar Clouds and Star Formation in Proceedings of 'Life in the Universe' Ed. J. Seckbach, Chela-Flores, J., S.K. Chakrabarti, S. Chakrabarti and K. Acharyya, 2004, Owen, T. and Raulin, F. (Eds.), Kluwar Publications, 191
 29. Molecular Hydrogen Formation During Interstellar Cloud Collapse K. Acharyya, S.K. Chakrabarti, S. Chakrabarti, 2005, *MNRAS*, 361, 550
 30. Monte-Carlo Simulation of Molecular Hydrogen Formation on Grain Surfaces, A. Das, Sandip K. Chakrabarti, Sonali Chakrabarti, and Kinsuk Acharyya, 2005, *BASI*

33, 390

31. Recombination Efficiency of Molecular Hydrogen on interstellar Grains - II. A Numerical Study, S.K. Chakrabarti, A. Das, K. Acharyya and S. Chakrabarti, 2006, *Bul. Astron. Soc. Ind.*, 34, 299.

32. Effective grain surface area in the formation of molecular hydrogen in interstellar clouds, S.K. Chakrabarti, A. Das, K. Acharyya and S. Chakrabarti, 2006, *A&A*, 457, 167

33. Unusual behaviour of D-region Ionization time at 18.2kHz during Seismically Active Days, S. Chakrabarti, S. Sasmal, M. Saha, R. Khan, D. Bhoumik, S.K. Chakrabarti, 2007, *Ind. J. Phys.*, 81,531.

34. Time evolution of simple bio-molecules during proto-star collapse, A. Das, S.K. Chakrabarti, K. Acharyya, S. Chakrabarti, 2008, *New Astronomy*, 13, 457

35. Formation of Water and Methanol in Star forming Molecular clouds, A. Das, K. Acharyya, S. Chakrabarti, S.K. Chakrabarti, 2008, *Astronomy and Astrophysics*, 486, 209

36. Average recombination time of atomic hydrogen on grain surfaces: A Monte Carlo study, A. Das, S. K. Chakrabarti, K. Acharyya and S. Chakrabarti, *COSPAR*, 36, 623 (2006).

37. Monte-Carlo simulation of Production of Hydrogen Molecule on Grain Surfaces, S. K. Chakrabarti, K. Acharyya, S. Chakrabarti and A. Das, 2006, In *Book of Abstract: Complex molecules in space and the Present status and prospects with ALMA*, p.57

38. Time dependent chemical evolution of molecular clouds, 2006, by A. Das, S. K. Chakrabarti, K. Acharyya, S. Chakrabarti, In *Book of Abstract:Complex molecules in space and the Present status and prospects with ALMA*, p.59

39. Methanol Formation: A Monte Carlo Study, 2008, A. Das, K. Acharyya, S. Chakrabarti, S. K. Chakrabarti, *Proceedings of the International Astronomical Union* (2008), 4, 121 (CUP:Cambridge)

40. Formation of Water and Methanol in Star Forming Molecular Clouds, S. Chakrabarti, A. Das, K. Acharyya and S. K. Chakrabarti, 2008, *Origin of Life and Evolution of Biosphere*

41. S. K. CHAKRABARTI, S. SASMAL, S. CHAKRABARTI, 2010, Ionospheric Anomaly due to Seismic Activities - II: Evidence from D-Layer preparation and disappearance times, *Nat. Haz. Earth. Syst. Sc.* 10, 1751

42. S. Maji, S. CHAKRABARTI, S.K. Chakrabarti, 2011, Very Low Frequency observation of a solar flare by lunar occultation during annular solar eclipse of January 15th, 2010, *URSI General Assembly (Beijing) proceedings*, DOI: 10.1109/URSIGASS.2011.6051006, (IEEE Conference Publications)

43. S. Sasmal, S.K. Chakrabarti, S. CHAKRABARTI, 2011, Studies of the correlation between ionospheric anomalies and seismic activities in the Indian subcontinent, *URSI General Assmebly (Beijing) proceedings*, DOI: 10.1109/URSIGASS.2011.6051044 (IEEE Conference Publications)

44. L. Majumdar, A. Das, S. K. Chakrabarti, S. CHAKRABARTI, 2012, Hydrochemical study of the evolution of interstellar pre-biotic molecules during the collapse of molecular clouds, *Research in Astronomy and Astrophysics*, 12, 1613 .
45. 2D hydrodynamic simulation coupled with the chemical evolution to study the physics and Chemistry of the ISM, 2012, A. Das, L. Majumdar, S. K. Chakrabarti & S. Chakrabarti, Abstract book of 39th COSPAR conference, Mysore (July, 2012).
46. Spectral signature and chemical evolution of some complex molecules which could be treated as the precursor of some bio-molecules in the ISM, 2012, Liton Majumdar, Ankan Das, Sandip K. Chakrabarti & Sonali Chakrabarti, Abstract book of 39th COSPAR conference, Mysore (July, 2012).
47. Formation of some of the bases of DNA in the interstellar space during the molecular cloud collapse, 2012, by Liton Majumdar, Ankan Das, Sandip K. Chakrabarti & Sonali Chakrabarti, Abstract book of 39th COSPAR conference, Mysore (July, 2012).
48. Effect of photo-dissociation on the composition of the grain mantle, 2012, by Ankan Das, Rajdeep Saha, Liton Majumdar, Sandip K. Chakrabarti & Sonali Chakrabarti, Abstract book of 39th COSPAR conference, Mysore (July, 2012).
49. A. Das, L. Majumdar, S. K. Chakrabarti, S. CHAKRABARTI, 2013, Chemical evolution during the process of proto-star formation by considering a two dimensional hydrodynamic model, *New Astronomy* 23, 118.
50. L. MAJUMDAR, A. Das, S. K. CHAKRABARTI, S. Chakrabarti, 2013, Study of the chemical evolution and spectral signatures of some interstellar precursor molecules of adenine, glycine & alanine, *NewA*, 20, 15.
51. A. Das, L. Majumdar, S.K. Chakrabarti, R. SAHA and S. CHAKRABARTI, 2013, Formation of cyanoformaldehyde in the interstellar space, 2013, *Monthly Notices of the Royal Astronomical Society*, 433, 3152.
52. A. Das, S. K. Chakrabarti, K. Acharyya, S. CHAKRABARTI, 2013, Methanol formation around the star forming region, AIP conference proceedings No. 1543 on 'Chemical Evolution of Star Forming Regions and Origin of Life' (American Institute of Physics: New York).
53. A. Das, S. K. Chakrabarti, K. Acharyya, S. CHAKRABARTI, 2013, Monte Carlo Simulation of the Production of Hydrogen Molecules on Grain Surfaces, AIP conference proceedings No. 1543 on 'Chemical Evolution of Star Forming Regions and Progin of Life' (American Institute of Physics: New York).
54. L. Majumdar, A. Das, S. K. Chakrabarti, S. Chakrabarti, 2013, A 2D hydrodynamic simulation coupled to chemical evolution around star forming region: A time dependent study AIP conference proceedings No. 1543 on 'Chemical Evolution of Star Forming Regions and Origin of Life' (American Institute of Physics: New York).
55. R. Saha, L. Majumdar, A. Das, S. K. Chakrabarti, S. Chakrabarti, 2013, Formation of the nucleobases around the Star forming region, AIP conference proceedings No. 1543 on 'Chemical Evolution of Star Forming Regions and Origin of Life' (American Institute of Physics: New York).
56. L. Majumdar, A. Das, S. K. Chakrabarti, S. Chakrabarti, 2013, Quantum Chemical

approach to study the spectral properties of some important precursor of bio-molecules, AIP conference proceedings No. 1543 on 'Chemical Evolution of Star Forming Regions and Origin of Life' (American Institute of Physics: New York).

57. S.K. Chakrabarti, D. Bhawmick, S. Chakraborty, S. Palit, S.K. Mondal, A. Bhattacharyya, S. Midya and S. CHAKRABARTI, 2014, Study of the Properties of Cosmic rays and Solar X-rays by Low Cost Balloon borne experiments, Ind. J. Phys., 88, 333 .

58. S.K. Chakrabarti, L. Majumdar, A. Das, and S. CHAKRABARTI, S., 2015, Search for Interstellar Adenine, Astrophysics and Space Science, 357, 90.

59. S. Ghosh, S. Chowdhury, S. Kundu, S. Biswas, A. Dawn, S. Ray, A. K. Chowdhury, W. Bari, D. Bhowmick, S. Manna, S. K. Mandal, S. Chakrabarti, R. Maiti, R. Das, T. Basak, S. K. Chakrabarti, 2023, Multi-Station observations and its interpretation from D-layer modeling of Annular Solar Eclipse December 26, 2019; Astrophysics and Space Science, 368(3), 10.1007/s10509-023-04179-1.

(B) Other Publications:

1. Chakrabarti, S. *Meditation, a few Thoughts on a Scientific Line*, Prabuddha Bharat, 4, 13 (1990).

2. Chakrabarti, S., 2000-2007, Several articles are written for the half-yearly Bengali magazine, Mahaviswa-o-Aami, published by Indian Centre for Space Physics.

3-4. Two articles in Bengali in the College Academic Journal, 'Uttaran' (2007 & 2009)

Joint/Associate Supervisor of

1. Kinsuk Acharyya, Ph.D. completed from Calcutta University (Present position, Faculty at Physical Research Laboratory, Ahmedabad)

2. Ankan Das, Ph.D. completed from Calcutta University (Present position, Faculty at IASES)

3. L. Majumdar, Ph.D completed from Calcutta University (Present position, Faculty at NISER, Bhubneswar)

Attendance Of National And International Conferences

1. Participated at the URSI General Assembly at Istanbul Convention Centre, TURKEY, 13 - 20 August 2011

2. Participated at the Conference on "Role of Small Telescopes in Modern Astronomy Research" at S.N. Bose National Centre for Basic Sciences, November, 2011

3. Participated at the International conference on "Chemical Evolution of Star Forming region and Origin of Life" at S.N. Bose National Centre for Basic Sciences (10-13th July, 2012).
4. Participated at the 39th COSPAR conference, Mysore (July, 2012).
5. Participated at the 101st Indian Science Congress at the Jammu University (February 3-7, 2014).
6. Participated at the "1st Biennial Conference on Astronomy, Astrophysics and Space Science - Exploring the Universe: from Near to Far", February, 2024 at ICSP integrated campus and IERCOO, Sitapur.

Lectures

A series of seminars were presented at the Indian Institute of Chemical Biology on mathematical Models of Biological Systems.

Participated in the Young Scientists Colloquium at the Saha Institute of Nuclear Physics, Calcutta (1994) organized by Indian Physical Society

Search for Pre-biotic Molecules in Space, at the National Conference on "Young Astrophysicists of Today's India" (YATI), at the S.N. Bose National Centre for Basic Sciences. (1998)

Several lectures have been given at Districtwise Space Science Symposium organized by Indian Centre for Space Physics (ICSP) and a Seminar on Astrobiology at ICSP, Kolkata.(2000-2005)

Poster presented at the 15th International Conference on the "Origin of Life" (Aug. 2008), in Florence, Italy

A seminar at the "Physics of the Living State" Series at International Centre for Theoretical Physics, Sept. 2008.

Present Research Interests

VLF Astronomy: Study of correlation between seismic activities and the anomalous behaviour of Very Low Frequency radio signals.

Astrobiology/Astrochemistry: Study of the origin of complex bio-molecules during star formation processes.