

## CURRICULUM VITAE

**NAME** : Balabhadrapatruni Naga Rajasekhar

**DESIGNATION** : *Scientific Officer (H)*

**DATE OF BIRTH** : July 24, 1963

**ADDRESS FOR CORRESPONDENCE** : E57, Sector – 4, RRCAT Colony RRCAT PO), Indore  
Madhya Pradesh, - 452013

**Email** : bnrsl963@gmail.com, [indus2006@yahoo.co.uk](mailto:indus2006@yahoo.co.uk)

**PRESENT POSITION** : Honorary Associate  
Institute of Astronomy, Space and Earth Science  
P177, CIT Road, Scheme 7m Kolkata – 700054  
<http://iases.org.in/contact.html>

**POSITION HELD** : *Head, Beamline Development Section,  
Atomic and Molecular Physics Division, Bhabha Atomic  
Research Centre, Mumbai - 400085  
BARC Beamlines Section, RRCAT, Indore 452013  
&  
Professor, Homi Bhabha National Institute, Mumbai – 400094*

**PERMANENT ADDRESS** : E57, Sector – 4, RRCAT Colony RRCAT PO), Indore 452013

### EDUCATIONAL QUALIFICATIONS:

Name of the course	University	Year	Class	Specialization
B.Sc	Nagarjuna University, Guntur, AP	1983	Ist	Physics
M.Sc	Andhra University, Visakhapatnam, AP	1985	Ist	Physics
DCA	Annamalai University, Tamilnadu	1986	Ist	Fortran, Basic
Orientation course	Training School, BARC, Mumbai	1987	-	Physics
PhD	Bombay University, Mumbai	1998	-	Physics

### PROFESSORIAL DETAILS:

Joining Date (DAE)	Post	Basic (Rs./-)	Scale of PAY (Rs.)	Scale
1/8/1986	Trainee	1400	NA	NA
01/08/1987	SO -SC	2500	2200-75-2800	L-10
01/08/1991	SO -SD	3000	3000-100-3500	L-11
01/08/1996	SO-SE	12750	12000-375-16500	L-12
01/08/2002	SO-F	14700	14300-400-18300	L-13
01/08/2009	SO-G	47420	37400-67000 (PB-4)	L-13A
18/08/2016	SO-H	1,82,700	1,82,700-2,18,200	L-14

### TECHNICAL EXPERTISE:

*Design, Development and utilization of UV – VUV and soft X-ray beamlines using photons from bending magnet and insertion devices at synchrotron facilities*

## RESEARCH INTERESTS:

*Spectroscopic studies on molecules, molecular crystals and Nano- materials using UV, VUV and soft X-ray Absorption, ionization, dissociation, photoemission and luminescence techniques*

## VISIT TO OTHER LABS OUTSIDE INDIA:

- *Visiting scientist to Open University, UK, and Astrid Storage Ring, Facility, Aarhus, Denmark for one month in 2010 to study molecules of astrochemistry interest using VUV & infrared spectroscopy techniques*
- *Visiting scientist to Open University, UK, and Astrid Storage Ring Facility, Aarhus for one month in 2005 to Perform Molecular Physics experiments in gas & solid phase experiments on polyatomic molecules*
- *Guest researcher at National Synchrotron Research Centre, Thailand (August 1999- July 2001), for the design & development of a beamline and experimental station, for photoemission spectroscopy*
- *School and workshop on nano-structures and nanotubes held at Cagliari, Sardinia, Italy, Sept. 24 to Oct.04, 2000*
- *Second School on Synchrotron Radiation held at ICTP, Trieste, Italy, Oct. 28 - Nov.19, 1993*

## RESEARCH EXPERIENCE

- *UV-VUV/ IR spectroscopy studies of diatomic and polyatomic molecules in gas, ice and matrix isolated phases*
- *Measurement of photoabsorption cross-sections volatile organic and bio-molecules*
- *Photoluminescence and resonant Raman spectroscopy studies on defects produced by gamma, neutron and electron irradiation on glasses, optical and photonic crystals*
- *Time resolved beam-foil spectroscopy studies on charged atomic beams*
- *Ultra trace analysis of materials at sub PPM levels using ICPAES and XRF techniques*

## DEVELOPMENTAL EXPERIENCE

- *Design and development of UV-VUV to soft X-ray beamlines based on Indus -1 & Indus -2 synchrotron sources for Atomic and Molecular Physics and Optical Science*
- *Design and developments of experimental facilities for room & low temperature absorption, and chemistry consequent of photon, electron and ions impact for Molecules at room & low temperature photoluminescence, Chemistry of molecular ices, matrix isolation spectroscopy*
- *Design and development of a soft X-ray beamline and experimental stations for angle resolved and high-resolution photoemission experiments at Siam Photon Laboratory, Thailand.*
- *Radiation safety evaluation and analysis of the Siam Photon Laboratory, Thailand to obtain permission for operation from Thai Atomic Energy commission (OAEP) and setting up radiation safety guidelines and safety regulations*

## SCIENTIFIC CONTRIBUTIONS:

<i>Journal publications</i>	: 100
<i>BARC external Reports</i>	: 9
<i>Reviewed Conference proceedings/ Newsletters</i>	: 19
<i>International/national conference publications</i>	: 84
<i>Invited talks</i>	: 16
<i>Organization of meetings</i>	: 5
<i>Participation in international / National workshops</i>	: 10

## LIST OF JOURNAL PUBLICATIONS

### 2023(6)

1. "Conformational effects in the vibrational and electronic spectra of propionaldehyde: Experimental and theoretical studies", Neha Sharma, Aparna Shastri, Asim Kumar Das, and B.N. Rajasekhar, Accepted for publication in *Journal of chemical Physics*.
2. "Detection of polycyclic aromatic hydrocarbons on a sample of comets", Arijit Roy, R. Ramachandran, U. Hill, B.N. Rajasekhar, Bhardwaj Anil, N.J. Mason, B. Sivaraman, accepted for publication, *Journal of Astronomy and Astrophysics*
3. "MID-IR CHARACTERIZATION OF 1- AND 2- CYANONAPHTHALENES UNDER CONDITIONS COMMENSURATE WITH COLD DUST IN THE INTERSTELLAR MEDIUM", K K Rahul, J K Meka, A Roy, S Pavithraa, A Das, B N Rajasekhar, P Janardhan, Anil Bhardwaj, N J Mason, B Sivaraman, *Journal of chemical Sciences* 135,77, 2023
4. "Interstellar Carbonaceous Dust and Its Formation Pathways: From an Experimental Astrochemistry Perspective", Arijit Roy, V. S. Surendra, R. Ramachandran, J. K. Meka, S. Gupta, P. Janardhan, B. N. Rajasekhar, H. Hill, Anil Bhardwaj, N. J. Mason and B. Sivaraman- *Journal of Indian Institute of Science*, 134,2023,
5. Asim Kumar Das, Sunanda K. and B.N. Rajasekhar, "Electronic spectroscopy of Trans-2-Hexenal and 3-Hexanol: Experimental and computational studies", *Journal of quantitative spectroscopy and radiative transfer*, 299, 108509, 2023
6. "<sup>13</sup>C Graphene Synthesized in Astrochemical Ices ",B Sivaraman, K K Rahul, M Ambresh, D Sahu, J K Meka, S -L Chou, Y -J Wu, D Gupta, A Das, J -I Lo, B -M Cheng, B N Rajasekhar, A Bhardwaj, N J Mason, *European Journal of Physics-D*, 77, 24, 2023

### 2022(11)

7. "Shock induced transformation of non-magnetic to magnetic dust analogue", Arijit Roy, Surendra Vikram Singh, J K Meka, R Ramachandran, D Sahu, A Goutam, T Vijay, V Jayaram, P Janardhan, B N Rajasekhar, Anil Bhardwaj, N J Mason, B Sivaraman, accepted for publication in *MNRAS Monthly Notices of the Royal Astronomical Society*, Volume 517, Issue 4, December 2022,
8. "Femtosecond multiphoton ionization of dialkyl carbonate green solvents at 400nm using photoelectron-photoion coincidence imaging", Asim Kumar Das, Rishabh Tripathi, Aparna Shastri, Sunanda Krishnakumar, N. Bhargava Ram and B.N. Rajasekhar, *International*

*Journal of mass spectrometry, International Journal of Mass Spectrometry* 482, 116921, 2022

9. "VUV Photoabsorption of Thermally Processed Carbon Disulfide and Ammonia Ice Mixtures –Implications for Icy Objects in the Solar System", S Pavithraa, R Ramachandran, D V Mifsud, J K Meka, J I Lo, S L Chou, B M Cheng, B N Rajasekhar, Anil Bhardwaj, N J Mason and B Sivaraman, *Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy*, 121645, 1386, 2022
10. "Shock processing of amorphous carbon nanodust", A Roy, V S Surendra, M Ambresh, D Sahu, J K Meka, K K Rahul, P Samarth, S Pavithraa, V Jayaram, H Hill, J Cami, B N Rajasekhar, P Janardhan, A Bhardwaj, N J Mason, B Sivaraman, *in Press - Advances in Space Research* 70 (2022) 2571–2581
11. "Enhanced ferroelectric and piezoelectricity in 100 MeV Ag<sup>7+</sup> Ion Irradiated <011> oriented TGS single crystals", V.C. Bharath Sabarish, A. Durairajan, M.P. Graca, M.A. Valente, J. Gajendiran, B.N. Rajasekhar, Asim Kumar Das, Rajeev Bhatt, Indranil Bhaumik, M. Soharab, Anil Kumar Sinha, Manvendra Narayan Singh, S. Gokulraj, G. Ramesh Kumar, *Applied Physics A*, 128, 567, 2022
12. "A spectroscopic study of Benzonitrile", B.N. Rajasekhar, Vijay Dharmarpu, Asim Kumar Das, Aparna Shastri, A.Veeraiah and Sunanda Krishnakumar, *Journal of Quantitative Spectroscopy & Radiative Transfer*, 283, 108159, 2022
13. "Vacuum ultraviolet photoabsorption spectra of an in-situ synthesized peptide precursor – hydroxylamine on a cold astrochemical dust analogue", R Thombre, D Gupta, S Pavithraa, J -I Lo, S -L Chen, Y -J Wu, K K Rahul, B -M Cheng, H. Hill, A Bhardwaj, B N Raja Sekhar, N J Mason and B Sivaraman, *European Journal of Physics –D*, D 76 (3), 1-5, 2022
14. "Synchrotron based spectroscopic investigation of N,N-dimethylacetamide", Param Jeet Singh, A K Das, Kiran Kumar Gorai, A Shastri, Sunanda K, DV Udupa, and B.N Rajasekhar, *Journal of Quantitative Spectroscopy & Radiative Transfer* 280, 108092, 2022
15. "Three-dimensional complex architectures observed in shock processed amino acid mixtures", V S Surendra, V Jayaram, J K Meka, M Muruganantham, T Vijay, S Vijayan, B N Rajasekhar, A Bhardwaj, N J Mason and B Sivaraman, Pg. 1 – 14, Cambridge University Press: **09 February 2022**, DOI: <https://doi.org/10.1017/exp.2021.17>, *Experimental Results, Oxford university Journal*
16. "New Signatures of Bio-Molecular Complexity in the Hypervelocity Impact Ejecta of Icy Moon Analogues", by Surendra V. Singh, Haritha Dilip, Jaya K. Meka, Vijay Thiruvengatam, Vishakantaiah Jayaram, Mariyappan Muruganantham, Vijayan Sivaprahasam, Balabhadrapatruni N. Rajasekhar, Anil Bhardwaj, Nigel J. Mason, Mark J. Burchell, and Bhalamurugan Sivaraman, *Life Journal*, 12, 508, 2022
17. "FTIR and VUV Spectroscopic Characterisation of Thermally Processed and Electron Irradiated CO<sub>2</sub> Astrophysical Ice Analogues", 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, A. Das, B.-M. Cheng, B.N. Rajasekhar, A. Bhardwaj, and B. Sivaraman, 385, 111599, 2022, *Journal of Molecular spectroscopy*

18. "Vacuum Ultraviolet Photoabsorption Spectra of Icy Isoprene and its Oligomers", R Ramachandran, S Pavithraa, Jaya Krishna Meka, K K Rahul, J-I Lo, S -L Chou, B -M Cheng, B N Rajasekhar, A Bhardwaj, N J Mason, B Sivaraman, *Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy*, 268, 120586, 2022

## 2021 (8)

19. "Exploration of Gamma irradiations effects on the Structural, Spectral Characteristics, Thermomechanical behaviour and Optical constants in <011> Oriented Glycine-DiGlycinium Sulphate Single Crystals " , V.C. Bharath Sabarish, A. Durairajan, M.P. Graca, M.A. Valente, J. Gajendiran, B.N. Rajasekhar, Rajeev Bhatt, Indranil Bhaumik, A.K. Karnal, A.K. Sinha, M.N. Singh, S. Gokulraj, G. Ramesh Kumar, Vol.1248, 131450, 2021, *Journal of Molecular Structure*
20. "Electronic states of nitromethane: experimental and theoretical studies ", Aparna Shastri, Asim Kumar Das<sup>b</sup>, Sunanda K., B.N. Rajasekhar, accepted for publication, 276, 107933, 2021, *Journal of Quantitative Spectroscopy and Radiative Transfer*
21. "Preparation of Low Cost NaCl Single Crystal for IR Optical Window Applications", V.C. Bharath Sabarish, A. Durairajan, J. Gajendiran, B.N. Rajasekhar, Asim kumar Das, S. Gokul Raj, G. Ramesh Kumar, 32, 24971–24979, 2021, *Journal of Materials Science: Materials in Electronics*
22. "Spectroscopy of structural isomers of pentanes: An experimental and theoretical study", Asim Kumar Das, Sunanda K. and B.N. Rajasekhar, 1245, 131126, 2021, *Journal of Molecular Structure*
23. "Electronic and Vibrational Spectroscopy of Ethyl Methyl Carbonate: A comparative experimental and theoretical study", Asim Kumar Das, Sunanda K., and B.N. Rajasekhar, 272, 107789, 2021, *Journal of Quantitative Spectroscopy and Radiative Transfer*
24. "Influence of Nickel (Ni<sup>2+</sup>) Swift Heavy Ion (SHI) Irradiation on the Optical, Topological, Dielectric, Piezoelectric and Ferroelectric Properties of Oriented Ferroelectric Triglycine Sulphate Single Crystals, ", Bharath Sabarish V.C, Durairajan A. Graca M.P. Valente M.A. Gajendiran J. Rajasekhar B.N. Asim kumar Das; Bhatt Rajeev, Bhaumik Indranil, Karnal A.K. and Gokul Raj S., 138389, 769, 2021, *Chemical Physics Letters*
25. *Secrets of Rhea, the icy moon of Saturn, unveiled*, Doi:10.1038, *Nature India highlights*, 2021.13 Published online 27 January 2021)
26. "Possible detection of hydrazine on Saturn's moon Rhea", Mark Elowitz, Bhalamurugan Sivaraman, Amanda Hendrix, Jeniu-I. Lo, Sheng-L. Chou, Bing-M. Cheng, B. N. Raja Sekhar, Nigel J. Mason, 7, 1-7, 2021, *Science Advances Journal*

## 2020 (8)

27. "Shock Processing of Amino Acids Leading to Complex Structures—Implications to the Origin of Life", V. S. Surendra, V. Jayaram, J.K. K. Meka, S. Vijayan, V. Chandrasekaran, R. Thombre, T. Vijay, M. Ambresh, B. N. Rajasekhar, M. Muruganatham, A. Datey, H. Hill, A. Bhardwaj, G. Jagadeesh, K. P. J Reddy, N. J. Mason and B. Sivaraman, *Molecules Journal*, 25, 5634, 2020
28. "Surface and bulk modifications in gamma Irradiated <011> oriented ferroelectric Triglycine Sulphate (TGS) single crystals", V.C. Bharath Sabarish, G. Ramesh Kumar, S. Gokulraj, A. Durai Rajan, E. Venkata Ramana, Igor Bdikin, B.M.S. Teixeira, Nikolai Sobolev, M. P. F. Graça, M.A.Valente, B.N. Rajasekhar, *Optik journal*, 222, 165326, 2020
29. "UV/Vis. Photochemistry Database: Structure, Content and Applications", Andreas Noelle, Ann Carine Vandaele, Javier Martin-Torres, Chenyi Yuan, Balabhadrapatruni N. Rajasekhar, Askar Fahr, Gerd K. Hartmann, David Lary, Yuan-Pern Lee, Paulo Limão-Vieira, Robert Loch, Kristopher McNeill, John J. Orlando, Farid Salama, Richard P. Wayne, *Journal of Quantitative Spectroscopy & Radiative Transfer*, 253 (2020) 107056
30. "Residue from vacuum ultraviolet irradiation of benzene ices: Insights into the physical structure of astrophysical dust", K.K. Rahul, S. Karthik, J.K. Meka, A. Das, V. Chandrasekaran, B.N. Rajasekhar, J.-I. Lo, B.-M. Cheng, P. Janardhan, A. Bhardwaj, N.J. Mason, B. Sivaraman, *Spectrochimica Acta Part A: Molecular and Bio-molecular Spectroscopy*, 231, 117797, 2020.
31. "The electronic absorption spectrum of Anisole studied by photoabsorption spectroscopy and quantum chemical calculations", Aparna Shastri, Asim Kumar Das, B.N. Rajasekhar, *Journal of Quantitative Spectroscopy & Radiative Transfer* 242,106782, 2020
32. "6-Hydroxycoumarin using experimental and theoretical methods", D. Vijay, Y. Sushma Priya, M. Satyavani, Asim Kumar Das, B.N. Rajasekhar and A. Veeraiah, *Spectro Chimica Acta Part A: Molecular and Bio-molecular Spectroscopy*, 229, 117930, 2020
33. "Infrared attenuation due to phase change from amorphous to crystalline observed in astrochemical propargyl ether ices", K.K. Rahul, J.K. Meka, S. Pavithraa, P. Gorai, A. Das, J.-I. Lo, B.N. Rajasekhar, B.-M. Cheng, P. Janardhan, A. Bhardwaj, N.J. Mason, B. Sivaraman, *Spectro chimica Acta Part A: Molec. and Biomolec. Spectrosc.*, 231 117797, 2020
34. "N-Graphene Synthesized in Astrochemical Ices", Rahul, K K, Ambresh, M, Sahu, D, Meka, J K, Chou, S-L, Wu, Y-J, Gupta, D, Das, A, Lo, J-I, Cheng, B-M, Raja Sekhar, B N, Bhardwaj, A, Hill, H, Janardhan, P, Mason, N J, Sivaraman, B, *Materials Science, Physics*, ,arXiv:2008.10011 ,2020, : *Instrumentation and Methods for Astrophysics*

#### 2019(4)

35. "Electronic spectroscopy of ethanol: An experimental and theoretical study", Sunanda K, Asim Kumar Das and B.N. Rajasekhar, *Journal of Quantitative Spectroscopy & Radiative Transfer*, 237, 106609, 2019

36. "Quantum chemical calculations and FTIR, UV light interactions on benzofuran-2-carbonyl chloride", D. Vijay, Asim Kumar Das, B N Rajasekhar and A.Veeraiah, *Journal of Emerging Technologies and Innovative Research* 6, 169-179, 2019.
37. "Complex macroscale structures formed by the shock processing of amino acids and nucleobases – Implications to the Origins of life", V S Surendra, V Jayaram, S. Karthik, S. Vijayan, V. Chandrasekaran, R Thombre, T. Vijay, B.N. Rajasekhar, A. Bhardwaj, G Jagadeesh, K P J Reddy, N J Mason, B Sivaraman *Astro-ph* arXiv: 1906.05958.
38. "Identification of a unique VUV photoabsorption band of carbonic acid for its identification in radiation and thermally processed water-carbon dioxide ices", S. Pavithraa, J.-I. Lo, B.-M. Cheng, B.N. Rajasekhar, N.J. Mason, B. Sivaraman, *Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy* 215, 130, 2019

#### **2018(4)**

39. "Vacuum ultraviolet photoabsorption of prime ice analogues of Pluto and Charon", S Pavithraa, J-I Lo, K Rahul, BN Raja Sekhar, B-M Cheng, Nigel J Mason, B Sivaraman, *Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy*, 190, 172-176, 2018
40. "Spectroscopy of diethyl carbonate, a green solvent: An experimental and theoretical study", Asim Kumar Das, B. N. Rajasekhar and Sunanda Krishnakumar, *Journal of Quantitative Spectroscopy & Radiative Transfer* 21, 53 - 62, 2018
41. "Experimental and computational VUV photoabsorption study of Dimethyl Carbonate: A Green Solvent", Asim Kumar Das, Sunanda Krishnakumar and B. N. Rajasekhar, *Journal of Quantitative Spectroscopy & Radiative Transfer* 217, 116 - 125, 2018.
42. "Development of an experimental set-up for low temperature spectroscopic studies of matrix isolated molecules and molecular ices using synchrotron radiation", Param Jeet Singh, K. Sundararajan, Aparna Shastri, Vijay Kumar, Asim Kumar Das, P.K. Kush and B.N. Rajasekhar, *Journal of Synchrotron Radiation* 25, 1425 - 1432, 2018

#### **2017(4)**

43. "Spectroscopy of N,N-dimethylformamide in the VUV and IR regions: Experimental and computational studies", Aparna Shastri, Asim Kumar Das, Sunanda Krishnakumar, Param Jeet Singh, and B. N. Raja Sekhar, *Journal of Chemical Physics* 147, 224305, 2017
44. "Qualitative observation of reversible phase change in astrochemical ethanethiol ices using infrared spectroscopy", S Pavithraa, R Rajan, P Gorai, J -I Lo, A Das, B N Raja Sekhar, T. Pradeep, B -M Cheng, N J Mason and B Sivaraman, *Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy* 178, 166 - 170, 2017
45. "SH Stretching Vibration of Propanethiol Ice - A Signature for its Identification in the Interstellar Icy Mantles", Pavithraa Sundararajan, Dipen Sahu, Gaurav Seth, Jen-Iu Lo, Raja Sekhar B N; Bing-Ming Cheng, Ankan Das, Nigel Mason and Bhalamurugan Sivaraman, *Astrophysics and Space Science* 362, 126, 2017

46. "Electronic spectroscopy of ethyl bromide probed by VUV photoabsorption and quantum chemical calculations A. Shastri, P. J. Singh, S. Krishnakumar, A. K. Das and B.N. Rajasekhar, *Phys. Chem. Chem. Phys.*, 19, 6454 - 6469, 2017

### 2016(5)

47. "Effect of gamma irradiation on X-ray absorption and photoelectron spectroscopy of Nd-doped phosphate glass", V. N. Rai, Parasmani Rajput, S. N. Jha, D. Bhattacharyya, B. N. Rajasekhar, U. P. Deshpande and T. Shripathi, *Journal of Synchrotron Radiation*, 23, 1424–1432, 2016
48. "Experimental and computational studies on the electronic excited states of nitrobenzene", Sunanda K, Asim Kumar Das, Param Jeet Singh, Aparna Shastri and B.N. Rajasekhar, *Journal of Quantitative Spectroscopy & Radiative Transfer* 184, 89 - 99, 2016
49. "Vacuum Ultraviolet Photoabsorption Spectra of Nitrile Ices for their Identification on Pluto", B Sivaraman, P Sundararajan, J–I Lo, B N Rajasekhar, H Hill, B–M Cheng, N J Mason, *The Astrophysical Journal*, 825, 141 - 144, 2016
50. "Thio-residue from thermal processing of cometary ices containing carbon disulfide and ammonia", Rabin Rajan J. Methikkalam, S. Pavithraa, S.P. Murali Babu, H. Hill, B.N. Rajasekhar, T. Pradeep, B. Sivaraman, *Advances in Space Research* 5, 438 - 443, 2016
51. "Photoabsorption spectra of tetramethylsilane in the energy region 6 - 11.5 eV", Asim Kumar Das, B.N. Raja Sekhar Sunanda Krishnakumar, *Indian Journal of Physics (India)* 90, 1 - 8, 2016

### 2015(2)

52. "Infrared spectra and chemical abundance of methyl propionate in icy astrochemical conditions", B. Sivaraman; N. Radhika; A. Das; G. Gopakumar; L. Majumdar; S. K. Chakrabarti; K. P. Subramanian; B. N. Raja Sekhar; M. Hada, *Monthly Notices of the Royal Astronomical Society* 448, 1372 - 1377, 2015
53. "Electronic states of carbon disulphide in the 5.5 -11.8 eV region by VUV photo- absorption spectroscopy", Sunanda Krishnakumar; Aparna Shastri, Asim K Das, B.N. Raja Sekhar, *Journal of Quantitative Spectroscopy & Radiative Transfer* 151, 76, 2015

### 2014(6)

54. "Vacuum ultraviolet photoabsorption of interstellar icy thiols", Radha Gobindha Bhui, Bhalamurugan Sivaraman, Jeniu I. Lo, B.N. Rajasekhar, Bing Ming Cheng, Thalappil Pradeep, and Nigel John Mason, *The Journal of Chemical Physics (Communications)* 141, 000030, 2014
55. "Beamline optics layout preparation and evaluation of the undulator based Atomic Molecular & Optical Science Research (AMOS) UVVUV soft X-ray beamline at Indus-2 synchrotron radiation source", Asim Kumar Das, B.N. Raja Sekhar, and B.N. Jagatap, *Indian Journal of Physics*, 88, 1235, 2014
56. "Vibronic and Rydberg Series Assignments in the Vacuum Ultraviolet Absorption Spectrum of Nitrous Oxide", Aparna Shastri, Param Jeet Singh, Sunanda Krishnakumar, *Anuvab*



- Mandal, B.N. Raja Sekhar, R. D'Souza and B.N. Jagatap, *Journal of Quantitative spectroscopy & Radiative Transfer* 14, 121, 2014
57. "Electron Impact Dissociation and VUV Photoabsorption of Frozen Formamide", B. Sivaraman, B. G. Nair, B N Rajasekhar, N C Jones, S V Hoffman, N J Mason, *Chemical Physics Letters*, **608**, 404, 2014
58. " Vacuum Ultraviolet Photoabsorption of Pure Solid Ozone and its Implication on the Identification of Ozone on Moon", B. Sivaraman, B. G. Nair, B. N. Rajasekhar, J. I. Lod, R. Sridharan, B. M. Cheng, N. J. Mason, *Chemical Physics Letters*, 603, 33, 2014.
59. "Rydberg and valence excited states of di - bromomethane in 35,000 - 95,000  $\text{cm}^{-1}$  region studied using synchrotron radiation", Anuvab Mondal, Param Jeet Singh, Aparna Shastri, Vijay Kumar, B.N. Rajasekhar, B N Jagatap, *Journal of Quantitative Spectroscopy & Radiative Transfer*, 144, 164, 2014.

### 2013 (6)

60. "Vacuum ultraviolet and infrared spectra of condensed methyl acetate on cold astrochemical dust analogs", Sivaraman, B. G. Nair, J.-I. Lo, S. Kundu, D. Davis, V. Prabhudesai, B. N. Rajasekhar, N. J. Mason, B.-M. Cheng, and E. Krishnakumar, *The Astrophysical Journal*, 778, 5pp, 2013
61. "Optical properties of sodium salicylate as a wavelength shifter under the effect of synchrotron radiation", Vijay Kumar, B.N. Rajasekhar, V N Rai, Param Jeet Singh, V Sivasubramanian, S K Deb and B N Jagatap, *Asian Journal of Physics*, 22, 19, 2013
62. " Ozone and Carbon trioxide Synthesis by Low Energy Ion Implantation onto Solid Carbon dioxide and Implications to Astro-chemistry", Bhalamurugan Sivaraman, B.N. Rajasekhar, Daniel Fulvio, Adam Hunniford, Bob McCulloch, Maria Palumbo and Nigel Mason, *Journal of Chemical Physics*, 139,074706, 2013
63. "Excited states of aniline by photoabsorption spectroscopy in the 30 000–90000  $\text{cm}^{-1}$  region using synchrotron radiation", B.N. Rajasekhar, A. Veeraiah, K. Sunanda, and B. N. Jagatap, *Journal of Chemical Physics*, 139, 064303-1, 2013
64. "Infrared spectrum of formamide in the solid phase", B. Sivaraman, B.N. Raja Sekhar, B.G. Nair, V. Hatode, N.J. Mason, *Spectrochimica Acta: Part A: Molecular and Biomolecular Spectroscopy*, 105, 238, 2013
65. "Effect of isotopic substitution in the electronic absorption spectrum of acetone: VUV photoabsorption studies of acetone-d<sub>6</sub>", Param Jeet Singh, Aparna Shastri, B.N. Raja Sekhar, R. D'Souza, B.N. Jagatap, *Journal of Quantitative Spectro. & Radiat. Transf.*, 114, 20, 2013

### 2012 (7)

66. " The role of torsional modes in the electronic absorption spectrum of acetone", Aparna Shastri, Param Jeet Singh, B.N. Raja Sekhar, R. D'Souza, B.N. Jagatap, *Journal of Quantitative Spectro. & Radia. Trans.*, 113, 1553, 2012.
67. "VUV spectroscopy of formamide ices" B. Sivaraman, B.N. Raja Sekhar, N.C. Jones, S.V. Hoffmann, N.J. Mason *Chemical Physics Letters* 554, 57, 2012

68. "Alternate design and characterization of CaF<sub>2</sub>/acetone bandpass photon detector with Kr filter gas for inverse photoemission spectroscopy", M. Maniraj, B. N. Raja Sekhar, and S. R. Barman, *Review of Scientific Instruments*, 83, 046107:1, 2012
69. "Study of gamma induced defects in Nd doped phosphate glass: an evaluation of photo-physics beamline on Indus-I", V.N. Rai, B.N. Rajasekhar, B.N.Jagatap, *Asian Journal of Spectroscopy Special issue*, Pg.121, 2012.
70. "Excited State Vibrational Modes of Triatomic Molecules of Environmental Interest: VUV Photoabsorption Studies using Indus-I Synchrotron Radiation Source", Aparna Shastri, Sunanda K., Param Jeet Singh, B.N. Raja Sekhar, S.V.N. Bhaskara Rao, R. D'Souza and B.N. Jagatap, *Asian Journal of Spectroscopy, Special issue*, Pg.107, 2012
71. "Photo-absorption studies on OCS in 30000 - 91000 cm<sup>-1</sup> region using synchrotron radiation source", Sunanda Krishnakumar; B.N. Rajasekhar, P. Saraswathy, B.N. Jagatap, *Journal of Quantitative Spectroscopy and Radiative Transfer*. 113, 58, 2012.
72. "Photo-absorption studies on Formaldehyde using Synchrotron radiation at Indus-I", K. Sunanda, B.N. Raja Sekhar, P. Saraswathy and B.N. Jagatap, *Spectroscopy letters, an International Journal for Rapid Communication Vol.45*, Pg.65, 2012.

### 2011 (7)

73. "Resonant Raman scattering in single crystal of congruent LiTaO<sub>3</sub>: Effect of excitation energy", Indranil Bhaumik, Shailendra Kumar, S. Ganesamoorthy, R. Bhatt, A. Karnal, B.N. Raja Sekhar, *Solid State Communications Vol. 15*, Pg.186, 2011.
74. "High energy resolution bandpass photon detector for inverse photoemission spectroscopy, M. Maniraj, S.W. D'Souza, J. Nayak, Abhishek Rai, Sanjay Singh, B. N. Rajasekhar, and Sudipta Roy Barman, *Review of scientific instruments Vol.82*, Pg. 093901, 2011
75. "Spectroscopic studies of Y-irradiated Nd doped Phosphate glasses", V. N. Rai, B. N. Raja Sekhar, P. Tiwari, R. J. Kshirsagar and S. K. Deb, *Journal of Non-Crystalline Solids*,.357, 3757, 2011
76. "Synthesis and characterization of various phases of cobalt oxide nanoparticles using inorganic precursor", R.K. Gupta, A.K. Sinha, B.N. Raja Sekhar, A.K. Srivastava, G. Singh and S.K. Deb, *Applied Physics A: Materials Science and Processing*, 103, 13, 2011
77. "Lattice expansion in ZnSe quantum dots", Saikat Chattopadhyay, Naveen V. Kulkarni, Kaushik Choudhury, R. Prasad, Aga Shahee, B.N. Rajasekhar, P. Sen, *Materials Letters* 65, 1625, 2011.
78. "Ceramic materials (phosphors) for display applications", K.V.R. Murthy, C.A. Rao, K. Suresh, B.S. Rao, B. Walter Ratna Kumar, B. N. Rajasekhar, B.N. Rao., *Eurasian Chemico-Technological Journal*, 13, 1, 2011
79. "Synthesis and characterization of Sr<sub>2</sub>CeO<sub>4</sub> phosphor doped with erbium", K.V.R. Murthy, K. Suresh, B. Nageswararao, B. Walter Ratna Kumar, C. Atchyutha Rao, B.N. Rajasekhar, B. Subbarao, N.V. Poornachandrarao, *Eurasian Chemico-Technological Journal*, 13, 17, 2011

### 2010(2)

80. "Photoabsorption spectroscopy of ammonia in 1050 to 2250 Å region", P. Saraswathy, K. Sunanda, S. Aparna and B.N. Rajasekhar, *Spectroscopy letters, an International Journal for Rapid Communication*, 43, 290, 2010

81. "Effect of gamma ray irradiation on optical properties of Nd doped phosphate glass", V. N. Rai, B. N. Raja Sekhar, S. Kher and S. K. Deb, *Journal of Luminescence*, 130, 582, 2010

#### **2009 (1)**

82. "The Vacuum Ultraviolet (VUV) Absorption Spectrum of Difluoromethane Reinvestigated", Aparna Shastri, B.N. Rajasekhar, Param Jeet Singh and M.N. Deo, *Spectroscopy letters, an International Journal for Rapid Communication*, 42, 1, 2009

#### **2008 (2)**

83. "Dispersion of Resonant Raman Peaks of CO and OH in SnO<sub>2</sub>, Mo<sub>1-x</sub>Fe<sub>x</sub>O<sub>2</sub> Thin Films and SiO<sub>2</sub> bulk glass" B. N. Raja Sekhar, R. J. Choudhary, D.M. Phase and Shailendra Kumar, *J. Phys. D: Appl. Phys.*, 41, 245302, 2008

84. "Resonant Raman of OH/OD vibrations and photoluminescence studies in LiTaO<sub>3</sub> thin film", S. Satapathy, Shailendra Kumar, B. N. Raja Sekhar and V. G. Sathe, and P. K. Gupta *Journal of Applied Physics*, 104, 033542, 2008

#### **2006 (3)**

85. "VUV photo-absorption spectroscopy of vinyl chloride studied by high resolution synchrotron radiation", P. Limão-Vieira, E. Vasekova, B. N. Raja Sekhar, N. J. Mason and S. V. Hoffmann, *Chem. Phys.* 330, 265, 2006

86. "VUV electronic state spectroscopy of 1,1-difluoroethylene and difluorochloromethane by high resolution synchrotron radiation", P. Limão-Vieira, E. Vasekova, B. N. Rajasekhar, N. J. Mason and S. V. Hoffmann, *Physical Chemistry Chemical Physics*, 8, 4766, 2006

87. "Observation and analysis of spectral interference modulations in thin film light scattering experiments using synchrotron radiation", N. K. Sahoo, S. Thakur, R. B. Tokas and B. N. Rajasekhar, *J. Phys. D: Appl. Phys.*, 39, 4059, 2006

#### **2005 (1)**

88. "C State mediated photoionization of CH<sub>3</sub>I in visible and near UV region", P. Sharma, R.K. Vatsa, B.N. Rajasekhar, N.C. Das, T.K. Ghanty and S.K. Kulshreshtha, *Rapid communications in mass spectrometry*, 19, 1522, 2005

#### **2003 (2)**

89. "Development of a beamline for photoabsorption and fluorescence spectroscopy experiments at Indus-I synchrotron source", N.C. Das, B.N. Raja Sekhar, S. Padmanabhan, S. Aparna, S.N. Jha, S. S. Bhattacharya, *Journal of optics (India)*.32 (4), 169, 2003

90. "Development of angle resolved photoemission spectroscopy beamline at Indus-I synchrotron source", N.C. Das, S.N. Jha, S.V.N. Bhaskara Rao, B.N. Raja Sekhar, S.S. Bhattacharya, Jagannath, A.V. Korganokar, K.G. Bhushan, V.C. Sahani and S.K. Sikka *Journal of optics, India*.32, 27, 2003

#### **2002 (1)**

91. "Optical design of angle resolved photoelectron spectroscopy beamline at INDUS-1 synchrotron radiation source", N.C.Das, S.N. Jha and B.N. Raja Sekhar, *Journal of optics, India*, 31, 129, 2002

### 2001(3)

92. "Comparison between varied spacing plane grating and varied spacing spherical grating monochromators", P. Songsiriritthgul, P. Sombunchoo, B.N. Raja Sekhar, W. Pairsuwan, T. Ishii and A. Kakazaki, *Nuclear Instrumentation Methods in Physics Research A*, .467, 1. 2001
93. "Photophysics beamline at Indus-1", P. Meenakshi Raja Rao, N.C. Das, B.N. Raja Sekhar, S. Padmanabhan, Aparna Shastry, S.S. Bhattacharya and A.P. Roy, *Nuclear Instrumentation Methods in Physics Research A*, 467 613, 2001
94. "Beam-foil spectrum of Al", Aparna Shastry, S. Padmanabhan, B.N. Rajasekhar, P. Meenakshi Raja Rao, and M.B. Kurup, *Indian Journal of Physics, India*, 75(B), 105, 2001

### 1999 (1)

95. "Image evaluation of the photophysics beamline at Indus-1 synchrotron source by ray tracing", N.C. Das and B.N. Raja Sekhar, *Journal of Optics (India)*, 28(4), 145, 1999

### 1998 (1)

96. "Mean life time measurements of FII and FIII levels using beam-foil technique", B.N. Raja Sekhar, S. Padmanabhan, Aparna Shastry, P. Meenakshi Raja Rao, M. Jagadesh, M.B. Kurup and K.G. Prasad, *Pramana, India*, 50(3), 231, 1998

### 1997 (3)

97. "Optical design procedure for high resolution VUV beamline", N.C. Das and B.N. Raja Sekhar, *Journal of Optics (India)*, 26(4), 181, 1997
98. "Mirror chambers and mirror mounts for photophysics beamline", P. Meenakshi Raja Rao, B.N. Raja Sekhar, N.C. Das, H.A. Khan, S.S. Bhattacharya, A.S. Raja Rao A.P. Roy, *Sadhana Journal, India*, 22, 1, 1997
99. "Beam-foil spectrum of Magnesium", B.N. Raja Sekhar, S. Padmanabhan, Aparna Shastri, P. Meenakshi Raja Rao, M. Jagadesh, M.B. Kurup and K.G. Prasad, *Indian Journal of Physics*, 71B (6), 651, 1997

### 1992 (1)

100. "Reinvestigation of some of the autoionizing levels in the spectrum of CuI", P. Meenakshi Raja Rao, S. Padmanabhan G. Krishnamurthy and B.N. Rajasekhar, *Journal of Quantitative Spectroscopy and Radiative Transfer*, 47, 113, 1992

## CONFERENCE PROCEEDINGS/NEWS LETTERS:

1. "Hypervelocity Impact on Amino Acids-Water Ice Targets Leading to the Formation of Crystalline Biomolecular Dust", VS Surendra, D Haritha, JD JK George, JK Meka, S Vijayan, T Vijay, BN Rajasekhar, A Bhardwaj, MJ Burchell, NJ Mason, B Sivaraman, *LPI Contributions*, 2678, 2011, 2022

2. "Understanding the Effects of Ethylene Glycol on Cometary Water", W Khan, R Ramachandran, P Sundararajan, JK Meka, BN Rajasekhar, S Ganesh, A Bhardwaj, NJ Mason, B Sivaraman, *LPI Contributions*, 2678, 2256, 2022
3. "Discovery of Complex Macroscale Structures in Impact Induced Shock Processed Biomolecules—Implications to the Origins of Life", VS Surendra, V Jayaram, S Karthik, S Vijayan, V Chandrasekaran, R Thombre, T Vijay, BN Rajasekhar, A Bhardwaj, G Jagadeesh, KPJ Reddy, NJ Mason, B Sivaraman, *Journal Large Meteorite Impacts and Planetary Evolution VI*, 2136, 5074, 2019
4. "Temperature Dependent Optical Transmission of CaF<sub>2</sub> Crystal in the VUV Region", Param Jeet Singh, Anita Gupta, Asim K. Das, Vijay Kumar, Aparna Shastri and B.N. Rajasekhar. *AIP proceedings of DAE Solid State Physics Symposium 2019*; MS ID: AIPCP20-AR-DAESSPS, 2019-00429
5. Divita Gupta, Rebecca Thombre, Jen Lo, Bing-Ming Cheng, Raja Sekhar B.N., et al.. *Vacuum Ultraviolet photoabsorption of molecules with astrochemical and astrobiological relevance: Benzonitrile and Hydroxylamine. The First International Astronomical Union Symposium on Laboratory Astrophysics, IAUS 350: Laboratory Astrophysics: from Observations to Interpretation, Apr 2019, Cambridge, United Kingdom.*
6. "VUV Molecular Spectroscopy using the Indus Synchrotron Radiation Source", B.N. Rajasekhar, Aparna Shastri, Param Jeet Singh, Asim Kumar Das and Sunanda K, *IANCAS special bulletin, "Application of Indus Synchrotron Radiation for Material Characterisation"*, Page. 48., 2018
7. "Growth and Characterization of Triglycine Sulphate Single Crystal by Sankaranaryanan–Ramasamy Method", V.C. Bharath Sabarish, G. Ramesh Kumar, S. Gokul Raj, A. Durairajan, B.N. Rajasekhar, *Materials Today: Proceedings 5 (2018) 18815–18822*
8. "Radiation shielding for undulator beamline in Indus-2 synchrotron radiation source", P. K. Sahani, A. K. Das, Haridas G., A. K. Sinha, B. N. Rajasekhar, T. A. Puntambekar and N K Sahoo, *Proceedings, Ninth International Workshop on Radiation Safety at Synchrotron Radiation Sources (RadSynch17) NSRRC, Taiwan April 19-22, 2017*
9. "Design and Optimization of gas bremsstrahlung stop for insertion device beamline on Indus-2", P. K. Sahani, Asim Kumar Das, Haridas G., A. K. Sinha, B.N. Raja Sekhar, T. A. Puntambekar, and N.K.Sahoo, *Proceedings, 20th National Symposium on Radiation Physics (NSRP-20), Oct. 28-30, 2015, Mangalore University in association with Indian Society for Radiation Physics (ISRP), Mangalore, India.*
10. "Thermal Analysis of an Insertion Device based Synchrotron Beamline Mirror using Finite Element Method", Vishal Kalidas Magar, Asim Kumar Das, Vikas Kumar Jain, Arvind Singh Padhiyar, Kavita Soni, L.N. Wankhade, Giridhar Mundra, N.K.Sahoo, and B.N. Raja Sekhar, *Proceedings, international conference on emerging trends in engineering, ICETE – 2014 (Excellent publishers, New Delhi, ISBN: 978-93-83083-80-0), 15 -17 May 2014, held at NITTE, Karnataka, India*

11. "Radiation characteristics of a planar permanent magnet (PPM) undulator for Atomic Molecular & Optical Science (AMOS) beamline", Asim Kumar Das, B. N. Raja Sekhar, and B. N. Jagatap, Abbdur Rahim, A.D. Ghodke and S.K. Deb, *Proceedings, Indian Particle Accelerator Conference*, Nov 19-22, 2013, VECC, Kolkata
12. "Effect of Flux on the formation of Sr<sub>2</sub>CeO<sub>4</sub> phosphor doped with Er", K.V.R. Murthy, B. Nageswara Rao, B.N. Raja Sekhar, B. Walter Ratna Kumar, K. Suresh and B. Subba Rao, *Physics Precede*, 29, 65, 2012.
13. "Molecular spectroscopy using Indus-1 Photophysics beamline", B.N. Rajasekhar, P. Saraswathy, Aparna Shastri, K. Sunanda, P. Singh, S.P. Somkuwar, and R. D'Souza, *ISAMP Newsletter Vol. IV Pg.10*, 2008.
14. "Development of photoelectron spectroscopy beamline at Indus-1 synchrotron radiation source", S.N. Jha, N.C. Das, S.V.N. Bhaskar Rao, B.N. Rajasekhar, A.K. Sinha, K. Bandopadhyay, Jagannath, A.V. Korganokar and K.G. Bhushan, *Solid state Physics (India)* 44, 585, 2001
15. "Design and evaluation of beamlines on INDUS-1 synchrotron source", N.C. Das and B.N. Raja Sekhar, *Proceedings, International Conference on Synchrotron Radiation Sources*, Feb.3-6, , 1992, held at CAT, Indore, India, Pg.354
16. "Design and development of photophysics beamline", P. Meenakshi Raja Rao, N.C. Das, B.N.Raja Sekhar, and V.B. Kartha, *Proceedings, International Conference on Synchrotron Radiation Sources*, Feb.3-6, , 1992, held at CAT, Indore, India, Pg.373
17. "Simulation of INDUS-1 synchrotron source for optical design", B.N. Rajasekhar, N.C. Das and G. Basavaraju, *Proceedings, International Conference on Synchrotron Radiation Sources*, Feb.3-6, , 1992, held at CAT, Indore, India, Pg.350
18. "Role of Beam Foil Spectroscopy in Understanding Basic Plasma Processes on the Sun", G. Krishnamurty, P.M. Raja Rao, P. Sarswathy, B.N. Rajasekhar, *Proceedings, 142nd. Symposium of the International Astronomical Union held in Bangalore, India, December 1-5, 1989. Editors, E.R. Priest, V. Krishan; Publisher, Kluwer Academic Publishers, Dordrecht, Holland; Boston, Massachusetts, 1990. ISBN # 0-7923-0879-4. LC # QB529 .I57 P.439, 1990.*
19. "Role of Plasma Spectroscopy in Understanding Basic Plasma Processes on the Sun ", P. M. Raja Rao, G. Krishnamurty, P. Sarswathy, B.N. Rajasekhar, *Proceedings, 142nd. Symposium of the International Astronomical Union held in Bangalore, India, December 1-5, 1989. Editors, E.R. Priest, V. Krishan; Publisher, Kluwer Academic Publishers, Dordrecht, Holland; Boston, Massachusetts, 1990. ISBN # 0-7923-0879-4. LC # QB529 .I57 P.439, 1990.*

#### **BARC EXTERNAL REPORTS:**

1. Asim Kumar Das, B.N. Rajasekhar and N.K. Sahoo, "An undulator based high flux and high resolution beamline for Atomic, Molecular and Optical Science (AMOS) research at INDUS-2 synchrotron radiation source (SRS)", *BARC Report – BARC/2014/E/008*

2. P. Saraswaty, K. Sunanda, S. Aparna, B.N. Raja Sekhar and N.C. Das, "Photoabsorption studies of polyatomic molecules using Indus-I synchrotron radiation source", BARC Report – BARC/2004/E/011
3. B.N. Raja Sekhar, P. Meenakshi Raja Rao, S.M. Chaudhari, and D.M. Phase, "A laboratory experimental setup for the reflectivity experiments", BARC Report No – BARC/2000/E/032.
4. P. Meenakshi Raja Rao, S. Padmanabhan, B.N. Raja Sekhar, Aparna Shastri, H.A. Khan and A. K. Sinha, "An ultrahigh vacuum monochromator for photophysics beamline", BARC Report No. – BARC/2000/E/020
5. N.C. Das and B.N. Rajasekhar, "Optimization of the Optical lay-out for the photophysics beamline at INDUS-I synchrotron radiation source", BARC Report - BARC/1998/E/011.
6. P. Meenakshi Raja Rao, B.N. Raja Sekhar, N.C. Das, H.A. Khan, S.S. Bhattacharya, A.P. Roy "Mirror chambers and mirror mounts for photophysics beamline", BARC Report No - BARC/1996/E011
7. N.C.Das and B.N. Rajasekhar, "Optical design procedure for high resolution VUV beamline at INDUS-I Synchrotron Radiation Source", BARC Report No – BARC/1996/E/027
8. N.C.Das and B.N. Rajasekhar, "Ray tracing scheme for evaluating high resolution VUV beamline at INDUS-I Synchrotron Radiation Source", BARC Report No - BARC/1995/E/018
9. N.C.Das, B.N. Rajasekhar and Dinesh Udupa, "Image evaluation of one meter Seya-Namioka monochromator at INDUS-I synchrotron radiation source", BARC Report No - BARC/1994/E/044

#### **PAPERS IN INTERNATIONAL/ NATIONAL CONFERENCES**

1. "A comparative study of electron induced dissociation of alkyl carbonate solvents", Asim Kumar Das, B. R. Gonde, Aparna Shastri, A. M. Kasbekar, V. Nataraju and B.N. Rajasekhar, presented in 23<sup>rd</sup> National conference on Atomic and Molecular Physics (NCAMP23) held at IIST Thiruvananthapuram, 20<sup>th</sup> -23<sup>rd</sup> Feb 2023
2. "A Theoretical and Experimental Investigation on the Electronic Structure and Spectrum of 1, 3-Dibromobenzene", Kiran Kumar Gorai, Aparna Shastri, Asim Kumar Das, B.N. Rajasekhar and S. N. Jha, *ibid*
3. "A Detailed vibrational spectral investigations of 2-Furyl methyl ketone", D. Vijay, Asim Kumar Das, B.N. Rajasekhar and A. Veeraiah, *ibid*.
4. "Comparative Theoretical and Experimental Study of the vibrational Spectra of Naphthalene and its Cyano-derivatives", Vandana Rawat, Aparna Shastri, Asim Kumar Das, S.R. Vishwakarma, Neha Sharma and B.N. Rajasekhar, *ibid*.
5. "Photoabsorption Studies of n-propylamine Using Synchrotron Radiation", Neha Sharma, Aparna Shastri, Asim Kumar Das, Vandana Rawat and B.N. Rajasekhar, *ibid*.

6. *“Hypervelocity impact on amino acids embedded in water ice”, Surendra Vikram Singh, Haritha Dilip, Jaya Krishna Meka, Vijay Thiruvengatam, Jayaram Vishakantiah, Mariyappan Muruganantham, Vijayan Sivaprahasam, Rajasekhar, Anil Bhardwaj, Nigel Mason, Mark Burchell, and Bhalamurugan Sivaraman , EPSC2021-466, Astrobiology, 15th Europlanet Science Congress 2021, held virtually, 13-24 September 2021*
7. *“Graphene in Titan”, Kushwaha, Rahul Kumar, Mallya, Ambresh, Sahu, Dipen, Krishna Meka, Jaya, Chou, Sheng-Lung, Wu, Yu-Jong, Gupta, Divita, Das, Ankan, Lo, Jen-Iu, Cheng, Bing-Ming, Rajasekhar, Balabhadrapatruni N, Bhardwaj, Anil, Hill, Hugh, Padmanabhan, Janardhan, Sivaraman, Bhalamurugan, EPSC2021-480, 15th Europlanet Science Congress 2021, held virtually, 13-24 September 2021*
8. *“Study structural isomers 3- hexanol & trans- 2- hexenal”, Sunanda K., A. K. Das, and B.N. Rajasekhar, DAE Symposium on 'Current Trends in Theoretical Chemistry CTTC 2020', organized by Chemistry division, BARC from 23<sup>rd</sup> to 25<sup>th</sup> September 2021*
9. *“Conformational Effects in Electronically Excited States of Propionaldehyde”, Aparna Shastri, Nishat Rathore, Asim Kumar Das and B.N. Rajasekhar, DAE Symposium on 'Current Trends in Theoretical Chemistry CTTC 2020' organized by Chemistry division, BARC from 23<sup>rd</sup> to 25<sup>th</sup> September 2021*
10. *Presence of N-Graphene in the residue obtained from irradiated benzonitrile ices Rahul Kumar Kushwaha, Ambresh M, Dipen Sahu, J K Meka, S -L Chou, Y -J Wu, Divita Gupta, A Das, J -I Lo, B -M Cheng, B N Rajasekhar, A Bhardwaj, H Hill, P Janardhan, N J Mason, B Sivaraman, APS March Meeting 2021, March 15–19, 2021, Bulletin of the American Physical Society*
11. *“Shock Synthesis of Complex Macroscale Structures in Impacting Mixture of Amino Acids and Nucleobases-Pathways Towards Complexity”, Vs Surendra, V Jayaram, S Karthik, S Vijayan, V Chandrasekaran, R Thombre, T Vijaya, BN Raja Sekhar, A Bhardwaj, G Jagadeesh, KPJ Reddy, NJ Mason, B Sivaraman, Lunar and Planetary Science , Conference, 2326, 1782, 2020*
12. *“BIOMARKER ON CALLISTO”, K. Rahul, J.-I. Lo, B.-M. Cheng, B. N. Rajasekhar, N. J. Mason, B. Sivaraman Europlanet Science Congress 2020, Virtual meeting, 21 September – 9 October 2020.*
13. *“Vibrational Spectroscopic studies on 2,3-Dihydrobenzofuran-5-carboxaldehyde” D.Vijay, Asim Kumar Das, B N Rajasekhar and A. Veeraiah, 8th Topical conference on Atomic and Molecular Collisions for Plasma Applications 3rd - 5th March 2020, at Indian Institute of Technology, Roorkee*
14. *Photoabsorption studies of trans-2-hexenal in the UV-VUV region, Sunanda K., A. K. Das and B.N. Rajasekhar, 8th Topical conference on Atomic and Molecular Collisions for Plasma Applications 3rd - 5th March 2020, at Indian Institute of Technology, Roorkee*
15. *“VUV Spectroscopy of Ethyl Methyl Carbonate”, A. K. Das, S. Krishnakumar and B.N. Rajasekhar, 8th Topical conference on Atomic and Molecular Collisions for Plasma Applications 3rd - 5th March 2020, at Indian Institute of Technology, Roorkee*



16. *"Photoabsorption studies of nitromethane using synchrotron radiation", A Shastri, AK Das, K Sunanda, BN Rajasekhar, oral presentation at NCAMPXXII, 8th Topical conference on Atomic and Molecular Collisions for Plasma Applications 3rd - 5th March 2020, at Indian Institute of Technology, Roorkee, India*
17. *"Residue from VUV irradiation of benzene ices", K K Rahul, P Janardhan, A Bhardwaj, B Sivaraman, J-I Lo, B -M Cheng, B. N. Rajasekhar, European conference on laboratory Astrophysics: linking DUST and Ice, ECLA-2020, April 19-20, 2020, ANCARPRI, CAPRI Island, USA.*
18. *"Vacuum Ultraviolet photoabsorption of molecules with astrochemical and astrobiological relevance: Benzonitrile and Hydroxylamine", The First International Astronomical Union Symposium on Laboratory Astrophysics, IAUS 350: Laboratory Astrophysics: from Observations to Interpretation, Apr 2019, Cambridge, United Kingdom*
19. *"VUV spectroscopic studies of environmental molecules in gas and matrix isolated phases", P. Singh, AK Das, KK Gorai, A. Shastri, Sunanda K., S.N. Jha, BN Rajasekhar, presented at Indus Synchrotrons User's Meeting (ISUM) at UGC-DAE CSR, Indore, March 27-29, 2019*
20. *"Investigations of Raman activity and biological importance on Benzofuran-2-carbonyl chloride", D.Vijay, Asim Kumar Das, B N Rajasekhar and A.Veeraiah, National symposium on Advances in Materials and Environmental Science" 25, Feb., 2019 organized by Dept. of Physics, D.N.R. College, Bhimavaram, Andhra Pradesh.*
21. *"Discovery of infrared attenuation due to phase change in astrochemical ices ", K. Rahul, J Meka, A Das, B N Raja Sekhar, B -M Cheng, N J Mason, B Sivaraman, 22nd National Conference on Atomic and Molecular Physics, 25 - 28 March 2019, Dept. of Physics, IIT Kanpur, India*
22. *"Electronic state spectroscopy of methacrolein", Sunanda K., A. K. Das, and B.N. Rajasekhar, ibid*
23. *"Studies on electronic and vibrational spectroscopic properties of propanol structural isomers", Param jeet Singh, Sunanda K., Asim Kumar Das, A.P. Mishra, and B.N. Rajasekhar, ibid*
24. *"Spectroscopic studies on Crotonaldehyde in the VUV region", A. K. Das, K. Sunanda, and B.N. Rajasekhar, ibid*
25. *"Structural study of hydrocarbon contamination layer on a grating surface consequent of Synchrotron radiation irradiation", Asim Kumar Das, Rahul Aggarawal, Sunanda Krishna Kumar, Alka A Ingle, B.N. Rajasekhar, 7<sup>th</sup> International Conference on Perspectives in Vibrational Spectroscopy, 25-29 November 2018, BARC, Mumbai*
26. *"Growth and Optical Properties of Low Cost NaCl Single Crystals for IR Optical Window Applications", V.C. Bharath Sabarish, G. Ramesh Kumar, Asim kumar Das and B.N. Rajasekhar, ibid*
27. *"Fate of Amino Acids and Nucleobases under Impact Induced Shock-Discovery of Complex Macroscale Structures and Implications to the Origins of life" Surendra Vikram*

*Singh, V Jayarm, S Karthik, S Vijayan, V Chandrasekaran, R Thombre, T Vijay, BN Raja Sekhar, Anil Bhardwaj, G Jadadeesh, KPJ Reddy, NJ Mason, B Sivaraman ...AGU Fall Meeting Abstracts 2019, EP51D-2113*

28. *"Ion implantation and its effects on lithium fluoride structure and spectral response", Asim Kumar Das, Aparna Shastri, Param Jeet Singh, Sunanda K, N.B.V Subrahmanyam and B.N. Rajasekhar, National Conference on Optics Photonics and Synchrotron Radiation for Technological Applications (OPSR- 2018), 29th April – 2nd May 2018, RRCAT, Indore*
29. *"Ultraviolet absorption cross sections of anisole using synchrotron radiation", Aparna Shastri, Asim Kumar Das, B.N. Raja Sekhar, National Conference on Optics Photonics and Synchrotron Radiation for Technological Applications(OPSR-2018), 29th April – 2nd May 2018, RRCAT, Indore*
30. *"Vacuum Ultraviolet (VUV) photoabsorption spectroscopy of Benzonitrile", B.N. Rajasekhar, Asim Kumar Das, Aparna Shastri, K. Sunanda, National Conference on Optics Photonics and Synchrotron Radiation for Technological Applications (OPSR-2018), 29th April – 2nd May 2018, RRCAT, Indore*
31. *"Vacuum ultraviolet spectroscopy of n- and iso-pentanes", Sunanda K. Asim Kumar Das and B.N. Rajasekhar, National Conference on Optics Photonics and Synchrotron Radiation for Technological Applications (OPSR-2018), 29th April– 2nd May 2018, RRCAT, Indore*
32. *"Vacuum ultraviolet photoabsorption spectroscopy of anisole", A. Shastri, A.K. Das, B.N. Raja Sekhar, presented at 7th Topical Conference of the Indian Society of Atomic and Molecular Physics(ISAMP),6 to 8, January 2018, held at Indian Institute of Technology (IIT) Tirupati, Andhra Pradesh, India*
33. *"Optical breath gas sensing using UV-VUV absorption spectroscopy", K. Sunanda, B.N. Rajasekhar, A. K. Das, presented at 7th Topical Conference of the Indian Society of Atomic and Molecular Physics(ISAMP),6 to 8, January 2018, held at Indian Institute of Technology (IIT) Tirupati, Andhra Pradesh, India*
34. *"VUV Spectroscopy of Diethyl Carbonate", A. K. Das, S. Krishnakumar, B. N. Rajasekhar, presented at 7th Topical Conference of the Indian Society of Atomic and Molecular Physics(ISAMP),6 to 8, January 2018, held at Indian Institute of Technology (IIT) Tirupati, Andhra Pradesh, India*
35. *"Synchrotron based VUV spectroscopy of dimethylacetamide", Param Jeet Singh, Asim Kumar Das, Kiran Kumar Gorai, Aparna Shastri, B N Raja Sekhar, Sunanda K, S N Jha, N K Sahoo, presented at 7th Topical Conference of the Indian Society of Atomic and Molecular Physics(ISAMP),6 to 8, January 2018, held at Indian Institute of Technology (IIT) Tirupati, Andhra Pradesh, India*
36. *"TDDFT computational study on the electronic excited states of dimethyl ether", B.N. Rajasekhar, Asim Kumar Das and Sunanda K., Presented at 21st National Conference on Atomic and Molecular Physics (NCAMP-XXI), January 3 - 6, 2017, Held at Physical Research Laboratory, Ahmadabad*

37. *"A spectroscopy study of ethanol and its conformers, Sunanda K., Asim Kumar Das and B. N. Rajasekhar, Presented at 21st National Conference on Atomic and Molecular Physics (NCAMP-XXI) , January 03 - 06, 2017, Held at Physical Research Laboratory, Ahmadabad*
38. *"Spectroscopy of dimethyl carbonate, a green solvent", Asim Kumar Das, B. N. Rajasekhar and Sunanda Krishnakumar, Presented at 21st National Conference on Atomic and Molecular Physics (NCAMP-XXI) , January 03 - 06, 2017, Held at Physical Research Laboratory, Ahmadabad*
39. *"Vacuum ultraviolet photoabsorption spectroscopy of dimethyl formamide Aparna Shastri, B.N. Raja Sekhar, Asim Kumar Das, Param Jeet Singh, Sunanda K. Presented at 21st National Conference on Atomic and Molecular Physics (NCAMP-XXI), January 03 - 06, 2017, Held at Physical Research Laboratory, Ahmadabad*
40. *Reversible Phase Change in Astrochemical Ethanethiol Ices, S Pavithraa, P Gorai, J-I Lo, A Das, B N Raja Sekhar, B -M Cheng, N J Mason and B Sivaraman, Presented at 21st National Conference on Atomic and Molecular Physics (NCAMP-XXI), January 03 - 06, 2017, Held at Physical Research Laboratory, Ahmadabad*
41. *"Ozone on Callisto", R K Kushwaha, S Pavithraa, J I Lo, B M Cheng, B N Raja Sekhar, N J Mason, B Sivaraman, Presented at 21st National Conference on Atomic and Molecular Physics (NCAMP-XXI), January 03 - 06, 2017, Held at Physical Research Laboratory, Ahmadabad*
42. *"Vacuum Ultraviolet Photoabsorption Spectra of Nitrile Ices for their Identification on Pluto, B Sivaraman, P Sundararajan, J –I Lo, B N Rajasekhar, H Hill, B –M Cheng, N J Mason, Presented at National Space Science symposium, 9-12, January 2016 held at Vikram Sarabai Space centre, Tiruvananthapuram, – received best poster award*
43. *"An experimental facility for low temperature spectroscopic studies on molecular solids at cryogenic temperatures", Param Jeet Singh, B.N. Rajasekhar, K. Sundararajan, Aparna Shastri, Asim Kumar Das, Vijay Kumar, A.K. Sagar, M.S. Ansari, K. Sunanda, K. Sankaran, P.K. Kush and N.K. Sahoo, Presented in DAE-BRNS Symposium on Condensed Matter Physics under Extreme Conditions CoMPEC-2016, April 13-16, 2016, Bhabha Atomic Research Centre, Mumbai, India*
44. *"VUV absorption studies on nitrobenzene using synchrotron radiation from Indus-I, B.N. Rajasekhar, Asim Kumar Das, Param Jeet Singh, Aparna Shastri and Sunanda Krishnakumar, Presented at 20th national conference on Atomic and Molecular Physics, NCAMP XX, , 9-12, December, 2014, IIST, Trivandrum*
45. *"VUV photoabsorption studies of ethyl bromide (C<sub>2</sub>H<sub>5</sub>Br) and its Deuterated isotopomer (C<sub>2</sub>D<sub>5</sub>Br) in the 50,000 – 95,000 cm<sup>-1</sup> region, Param Jeet Singh, Aparna Shastri, Asim Das, Sunanda K., B.N. Raja Sekhar, Presented at 20th national conference on Atomic and Molecular Physics, NCAMP XX, , 9-12, December, 2014, IIST, Trivandrum*
46. *"Photoabsorption spectrum of tetramethylsilane (TMS) IN 6 - 11.5 eV recorded using synchrotron radiation: an experimental and theoretical study", Sunanda K., Asim Kumar*

- Das and B.N. Raja Sekhar, Presented at 20th national conference on Atomic and Molecular Physics, NCAMP XX, , 9-12,December, 2014, IIST, Trivandrum*
47. *" Can we use the absorption at the Hartley band to confirm the presence of ozone on icy bodies in the solar system?", B. Sivaraman, B N Raja Sekhar, R Sridharan, B -M Cheng, N J Mason, Presented at 20th national conference on Atomic and Molecular Physics, NCAMP XX, , 9-12,December, 2014, IIST, Trivandrum*
  48. *"Vacuum ultraviolet photo-absorption of interstellar icy thiols", G Bhuin, B.Sivaraman, B. N. Raja Sekhar, J –I Lo, B -M Cheng, T. Pradeep and N. J. Mason, Presented at 20th national conference on Atomic and Molecular Physics, NCAMP XX, , 9-12,December, 2014, IIST, Trivandrum*
  49. *"Synchrotron based VUV spectroscopy in gas and matrix isolated phase" , Param Jeet Singh, Anuvab Mandal, Vijay Kumar, A. Shastri, B.N. Raja Sekhar, B.N. Jagatap, Presented at 7th Asia Oceania Forum for synchrotron radiation research, held at Egret Himeji, September 21-24, 2013, Hyogo, Japan*
  50. *"VUV Spectroscopy of Environmentally Important Molecules in Gas Phase and Matrix isolated Phase Using Synchrotron Radiation, Param Jeet Singh, Anuvab Mandal, Vijay Kumar, Aparna Shastri, K. Sundararajan, B.N. Raja Sekhar, and B.N. Jagatap, National Symposium on Radiation and Photochemistry (NSRP-2013), .March 20 - 22, 2013, Department of Chemistry, Northeastern Hill University (NEHU), Shillong, Meghalaya, India*
  51. *"VUV spectroscopy of SO<sub>2</sub> isolated in Argon matrix using synchrotron radiation", Param Jeet Singh, B.N. Raja Sekhar, Vijay Kumar, Anuvab Mandal, Aparna Shastri, and B.N. Jagatap, Presented at DAE-BRNS Symposium AMOS-2012, 4- 6, December 2012, TIFR, Mumbai*
  52. *"Probing vibronic structure of highly excited states of polyatomic molecules using synchrotron radiation", B.N. Jagatap, Aparna Shastri, Param Jeet Singh, Anuvab Mandal and B.N. Raja Sekhar, Presented at 10th Asian International Seminar on Atomic and Molecular Physics 2012, , 23-30 October, 2012, National Dong-Hwa University, Taipei, Taiwan*
  53. *"Vacuum Ultraviolet Absorption Spectra of Alkyl Phosphates", Param Jeet Singh, Aparna Shastri, B.N. Raja Sekhar and B.N. Jagatap, Poster at International Conference on Molecular Spectroscopy of Advanced materials and Biomolecules-IMSAB-2012 , Bishop Moore's College, Mavelikkara, Kerala, 7-9 August, 2012*
  54. *"The role of torsional vibrations in the electronic absorption spectrum of acetone", Aparna Shastri, B.N. Raja Sekhar, Param Jeet Singh, Poster at 99th Indian Science Congress, KIIT University, Bhubaneswar, 3-7 Jan, 2012*
  55. *"VUV Spectroscopy of astrochemical Ices", B. Sivaraman, B. N. Raja Sekhar and N. J. Mason, Presented at DAE-BRNS SYMPOSIUM on Atomic, Molecular and Optical Physics (SAMOP-2011), February 22-25, 2011, Department of Physics, Karnataka University, Dharwad, INDIA*

56. *"Electron irradiation of solid formamide", B. Sivaraman, B. N. Raja Sekhar and N. J. Mason, Presented at DAE-BRNS SYMPOSIUM on Atomic, Molecular and Optical Physics (SAMOP-2011), February 22-25, 2011, Department of Physics, Karnataka University, Dharwad, India*
57. *"Study of perturbations in electronic states because of charge transfer mechanisms in electronic absorption spectrum of aniline", B.N.Raja Sekhar and K. Sunanda, Presented at DAE-BRNS SYMPOSIUM on Atomic, Molecular and Optical Physics (SAMOP-2011), February 22-25, 2011, Department of Physics, Karnataka University, Dharwad- 580 003, India*
58. *"Effect of Isotopic Substitution on Valence and Rydberg Transitions Observed in the Electronic Spectrum of Acetone, Aparna Shastri and B.N. Raja Sekhar, DAE-BRNS SYMPOSIUM on Atomic, Molecular and Optical Physics (SAMOP -2011), February 22-25, 2011, Department of Physics, Karnataka University, Dharwad, India*
59. *"Gamma ray irradiation effect on spectroscopic properties of Dy<sup>3+</sup> - doped fluorophosphate glasses", N. Vijaya, C.K. Jayasankar, B.N. Raja Sekhar and Vijay Kumar, DAE-BRNS SYMPOSIUM on Atomic, Molecular and Optical Physics(SAMOP-2011), February 22-25, 2011, Department of Physics, Karnatak University, Dharwad - 580 003, India*
60. *"VUV Photoabsorption Studies of CHCl<sub>3</sub> and CDCl<sub>3</sub> Using photophysics Beamline at Indus-1", Aparna Shastri, Param Jeet Singh, B.N. Raja Sekhar and R. D'Souza, Poster at National symposium on radiation & Photochemistry, JNV, Jodhpur, 10-12 March, 2011.*
61. *"A microcontroller based movement control and data acquisition system for the Photophysics spectroscopy beamline at INDUS I Synchrotron Radiation Source", S. Ajaya kumar, R. Sampathkumar, S.P.Somkuwar, B.N. Raja Sekhar, R. D'Souza and S.V.G. Ravindranath, National Conference on Emerging Technologies in Electronics, Mechanical and Computer Engineering, 17- 18, April 2010, Indore Institute of Science and Technology, Indore*
62. *"Photophysics beamline at Indus-1", B. N. Raja Sekhar, Aparna Shastri, K. Sunanda, V.N. Rai, P. Singh and R. D'Souza, Presented at TC-2010, March 3-6, 2010 held at RRCAT, Indore, India*
63. *"VUV Photoabsorption Studies of Nitrous Oxide Using Synchrotron Radiation", Aparna Shastri, B.N. Raja Sekhar, Param Jeet Singh, R. D'Souza, Presented at TC-2010, March 3-6, 2010 held at RRCAT, Indore, India*
64. *"Photo absorption spectra of Formaldehyde in the 3-11 eV region using synchrotron radiation", K. Sunanda, B.N. Raja Sekhar and P. Saraswathy, Presented at TC-2010, March 3-6, 2010 held at RRCAT, Indore, India*
65. *" Photoabsorption studies on mixtures of CH<sub>2</sub>F<sub>2</sub> with atmospheric gases", Aparna Shastri, B.N. Rajasekhar, Param Jeet Singh and M.N. Deo, Presented at National conference on Atomic, molecular and nuclear physics, November 5-7, 2009, held at MMH College, Ghaziabad, India, Pg.69*

66. *"Photoabsorption spectra of carbonyl sulfide using synchrotron radiation", K. Sunanda, B.N. Rajasekhar and P. Saraswathy, Presented at National conference on Atomic, molecular and nuclear physics, November 5-7, 2009, held at MMH college, Ghaziabad, India. Pg.29*
67. *"VUV Photoabsorption Studies of Difluoromethane (CH<sub>2</sub>F<sub>2</sub>) Using Synchrotron Radiation", Aparna Shastri, B.N. Rajasekhar, Param Jeet Singh and M.N. Deo, Presented at Homi Bhabha centenary DAE-BRNS Symposium on Atomic, Molecular and Optical Physics, Feb. 10 -13, 2009, Inter University Accelerator Centre, Aruna Asaf Ali Marg, New Delhi*
68. *"Photo-absorption Spectra of Ammonia", P. Saraswathy, K. Sunanda, S. Aparna and B.N. Raja Sekhar, Presented at Homi Bhabha centenary DAE-BRNS Symposium on Atomic, Molecular and Optical Physics, Feb. 10 -13, 2009, Inter University Accelerator Centre, Aruna Asaf Ali Marg, New Delhi*
69. *"Photoabsorption spectra of Carbon disulphide using Photo Physics Beamline at Indus-1 SR Source", K. Sunanda, P. Saraswathy and B.N. Rajasekhar, Presented at Homi Bhabha centenary DAE-BRNS Symposium on Atomic, Molecular and Optical Physics, Feb. 10 -13, 2009, Inter University Accelerator Centre, Aruna Asaf Ali Marg, New Delhi*
70. *"Group delay dispersion induced spectral interference phenomena in optical thin film light scattering using synchrotron radiation", R.B. Tokas, N.K. Sahoo, S. Thakur, B.N. Rajasekhar and N.M. Kamble, Presented at Photonics 2006.*
71. *"VUV spectroscopic studies on interstellar and planetary atmospheric ices" , B. Sivaraman, M.P. Davis, A. Dawes, P.D. Holtom, B.N. Rajasekhar, S.V. Hoffmann, D.A. Shaw and N.J. Mason, Presented at Astrosurf, New astronomical challenges in surface science, 18- 19 April 2005, held at Department of chemistry, University college of London, UK*
72. *"Studies on methyl Iodide using photophysics beamline at Indus-1", B.N. Raja Sekhar, R.K. Vatsa, B. Pramod, N.C. Das and S.K. Kulshresta, Presented at 15<sup>th</sup> National conference on Atomic and molecular Physics, 20-23, December 2004, NCAMP-XV, held at Physical Research laboratory, Ahmadabad*
73. *"Photoabsorption studies of polyatomic molecules using the photophysics beamline at Indus-1", P. Saraswathy, K. Sunanda, S. Aparna, B.N. Raja Sekhar, and N.C. Das, Presented at 15th national conference on Atomic and molecular Physics, NCAMP-XV, 20 -23, December 2004, held at Physical Research laboratory, Ahmadabad*
74. *"First result using Angle Resolved Photoelectron Spectroscopy Beamline at Indus-1", S.N. Jha, N.C. Das, S.V.N. Bhaskara Rao, B.N. Raja Sekhar, Jagannath, A.V. Korganokar and V.C. Sahani, Proceedings Indian particle accelerator conference (INPAC), 3-6, February, 2003, held at Centre for Advanced Technology, Indore, Pg.28-29*
75. *"An estimation of radiation levels in and around Siam Photon Laboratory", B.N. Raja Sekhar, P. Songsiriritthgul, K. Urachat, W. Pairsuwan, N. Sugawara and T. Ishii,*

- Proceedings, 8th conference in Nuclear science and Technology, June 20-21, 2001, held at Kasasart university, Bangkok, Pg 149-164*
76. *"Photoemission beamline at Siam Photon Laboratory", P. Songsiriritthgul, B.N.Raja Sekhar, and W. Pairsuwan, Presented at the School and Workshop on Nano structures and Nanotubes, N&N 2000, held during 24th September to 4<sup>th</sup> October 2000 at Cagliari, Sardinia, Italy*
  77. *"Photoemission systems at Siam Photon Laboratory" , P. Songsiriritthgul, A. Kakazaki, B.N. Raja Sekhar, W. Pairsuwan and T. Ishii, Presented at National Conference on Science and Technology of Thailand 2000 (STT 2000), held at Bangkok, Thailand, during 18-20, October 2000, extended abstracts, Pg.655*
  78. *"Optical design for the first beamline at Siam Photon Laboratory", P. Songsiriritthgul, A. Kakazaki, B.N. Raja Sekhar, W. Pairsuwan and T. Ishii, Presented at the National Conference on Science and Technology of Thailand, (STT 2000), held at Bangkok, Thailand, during 18-20, October 2000, Pg.656*
  79. *"Beam foil spectrum of Aluminum", Aparna Shastri, Saraswathy Padmanabhan, B.N. Raja Sekhar, M.B. Kurup and P. Meenakshi Raja Rao, Presented at the National Symposium on Frontiers of Physics (APF-2000), held during 13-15, April, 2000, at Roorkee University, Roorkee, India*
  80. *"Preliminary results on VUV reflectivity experiments", Aparna Shastri, B.N. Raja Sekhar, D.M. Phase, S.M. Chaudhari and P. Meenakshi Raja Rao, Proceedings, DAE-BRNS workshop on thin film multilayers, 6 - 8, October, 1999 at BARC, Mumbai, India*
  81. *"Studies on fragmentation dynamics of Cholro-fluro-hydrocarbons using photoelectron and photo-ion coincidence (PEPICO) and photo-electron and photo-ion coincidence (PEPICO) techniques, B.N. Raja Sekhar and P. Meenakshi Raja Rao, Presented at India-Italy workshop on utilization of Synchrotron Radiation from Elettra, during 10-13, November, 1998 held at Saha Institute of Nuclear Physics, Calcutta, India*
  82. *"A one meter VUV monochromator for the photophysics beamline at INDUS-1", P. Meenakshi Raja Rao, Saraswathy Padmanabhan", N.C. Das, B.N. Raja Sekhar, H.A. Khan, S.S. Bhattacharya and A.P. Roy, Presented at the International Conference on Spectroscopy: Perspectives & Frontiers, during, 3-5, January, 1996, held at BARC, Mumbai, India*
  83. *"Spectroscopic beamlines at INDUS-1 Synchrotron Radiation Source facility", N.C. Das, P.M. Raja Rao, S.V.N. Bhaskara Rao, B.N. Raja Sekhar, P. Saraswathy, S.N. Jha, S.S. Bhattacharya and A.P. Roy, Proceedings, Fourth International Conference on Synchrotron Radiation Sources and the Second, Asian Forum on Synchrotron Radiation, Oct. 25-27, 1995, Hyundai Hotel, Kyongju, Korea*
  84. *"Design and development of beamlines at INDUS-1", P. Meenakshi Raja Rao, B.N. Raja Sekhar, N.C. Das, S. Padmanabhan, P.S. Murthy, S.V.N. Bhaskara Rao, V.B. Kartha, A.K. Sinha and S. Bhat Presented at 46th Okazaki international Conference on application of*

*synchrotron radiation to molecular science, present status and future prospects, Dec. 16 - 18, 1992, Okazaki, Japan*

#### **INVITED TALKS:**

1. “VUV spectroscopy study of photon/particle impacted of astrochemical relevant molecular systems”, *Astro-chemistry and Cratering in Solar System*”, held between 4 to 10 July 2022 at PRL, Ahmadabad.
2. *VUV spectroscopy research at Indus facilities, National Conference on Optics Photonics and Synchrotron Radiation for Technological Applications (OPSR-2018), 29th April – 2nd May 2018, RRCAT, Indore*
3. “UV - VUV spectroscopy for Astro-chemistry to medical diagnostics”, *Astrochem in terahertz region*, 30-31 October 2017, Maple Hall, Hotel Savera, Chennai
4. “Vacuum Ultraviolet Spectroscopy for Planetary Exploration”, *One day meeting on NEW HORIZONS @ PRL 14 July 2015, Physical Research Laboratory, Ahmadabad*
5. “Molecular Science research using UV – soft x-ray beamlines based on Indus synchrotron facility”, *National Seminar on role of Physics on Technology development, RPTD-2015, held at government college for Women, Srikakulam, Andhra Pradesh, 5-6 February 2015*
6. “A beamline for Atomic, Molecular and Optical Science (AMOS) at Indus-2 SRS”, - invited talk, *20th National conference on Atomic and Molecular Physics, NCAMP XX, held at IIST, Trivandrum, 9-12, December, 2014.*
7. *Invited presentation, “Molecular physics activity at Indus Synchrotron Radiation Source (SRS)”, SUP@VAMDC-India Discussion Meeting on Atomic and Molecular Data for Applications 2 - 4 April 2014, Inter University Accelerator Centre, New Delhi.*
8. *Invited plenary talk at “Characterization of advanced oxide optical materials”, National Seminar on Recent Trends in Advanced Materials, held at SIR C.R. Reddy autonomous college, Eluru, W.G (Dt.), A.P - 534007, during Jan. 27 & 28, 2012*
9. “Photoluminescence studies on oxide phosphors doped with rare-earths”, *national conference on luminescence and its applications, NCLA-2011, February 7-9, 2011.*
10. “Material characterization using laboratory and synchrotron Sources at Indus facilities”, *National Seminar on Advanced Materials for Display and other Applications [NSAM-2010], Tenali, AP, India during 31st May -1st June, 2010.*
11. “Photo-absorption spectroscopy studies on polyatomic molecules using indus- 1 synchrotron source”, *National Conference on advances in Atomic, Molecular and Nuclear Physics held at M.M.H. College, Ghaziabad, India during November 5-7, 2009*
12. “Photoabsorption studies using Indus-1 synchrotron source”, *Homi Bhabha centenary DAE-BRNS Symposium on Atomic, Molecular and Optical Physics, Feb. 10 -13, 2009, Inter University Accelerator Centre, Aruna Asaf Ali Marg, New Delhi.*
13. “Photoluminescence and photoabsorption studies using laboratory and Indus synchrotron Sources”, *international conference on luminescence and its applications, ICLA – 2008, February 13-16, 2008, NPL, New-Delhi*



14. *“Status of spectroscopy beamlines at Indus-1”, Department of Physics, university of Aarhus, Denmark on 17th April 2005.*
15. *“Status of Atomic and molecular spectroscopy beamlines at Indus-1”, 15<sup>th</sup> National conference on Atomic and molecular Physics, NCAMP-XV, held at Physical Research laboratory, Ahmadabad, during 20 –23, December 2004.*
16. *“Photophysics beamline and its applications”, - in Indo-German school on synchrotron radiation sources and their applications held at CAT, Indore during November 2002*

#### **INTERNAL REPORTS: 15**

#### **ORGANIZATION OF MEETINGS:**

1. *Secretary, Topical Conference on Interaction of EM Radiation with Atoms, Molecules, Clusters (TC - 2010), Raja Ramanna Centre for Advanced Technology, Indore – 452013, India, March 3-6, 2010*
2. *Member, Organizing committee, Symposium on Advanced Measurement Techniques and Instrumentation (SAMTI-2011)*
3. *Convener, Theme meeting on Atomic and molecular Science using Indus synchrotron facilities, held at RRCAT, Indore during 3-4 march, 2012*
4. *Member & Advisory committee, National Seminar, “Characterization of Advanced materials”, held at SIR C R REDDY AUTONOMOUS COLLEGE, ELURU, W.G (Dt), A.P - 534007, during Jan. 27-28, 2012*

#### **TEACHING AND CONSULTENCY:**

1. *Co-guide for three M.Tech students belonging to HBNI (Mumbai), DAVV (Indore), SIGISTS( Pune)*
2. *Guided one student towards PhD (Physics), with HBNI Mimbai.*

#### **PROFESSIONAL AFFILIATIONS:**

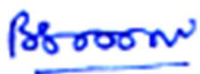
1. *Life member Indian Physics Association (IPA)*
2. *Life member Indian society for Atomic and molecular Physics (ISAMP)*
3. *Life member Indian society for Particle accelerators (ISPA)*
4. *Life member Indian Vacuum society (IVS)*
5. *Life member Society for Materials Chemistry (SMC)*

#### **JOURNAL REVIEWER:**

1. *Advances in Space Research*
2. *Journal of Alloys and Compounds*
3. *RSC Advances*
4. *Journal of Molecular structure*

**TECHNICAL COMMITTEES:**

<i>Task force for establishing AMOS beamline at Indus-2 synchrotron radiation source at RRCAT, Indore</i>	<i>Member</i>	<i>2 years</i>	<i>2017</i>
<i>Indus Beamline Utilization Proposal Scrutiny Committee RRCAT, Indore</i>	<i>Member</i>	<i>Till 31 July 2023</i>	<i>2017</i>
<i>Technical committee meeting indent of Monochromator for ARPES beamline, Indus-2 Synchrotron Radiation Source</i>	<i>Member</i>	<i>2 years</i>	<i>2014</i>
<i>Working Group is constituted to plan, design, develop and commission the various ID frontends at Synchrotron Radiation Source</i>	<i>Invitee</i>	<i>2 Years</i>	<i>2014</i>
<i>Working Group on Insertion Devices at Indus-2 Synchrotron Radiation Source</i>	<i>Member</i>	<i>4 years</i>	<i>2011</i>



(Balabhadrapatruni Naga Rajasekhar)