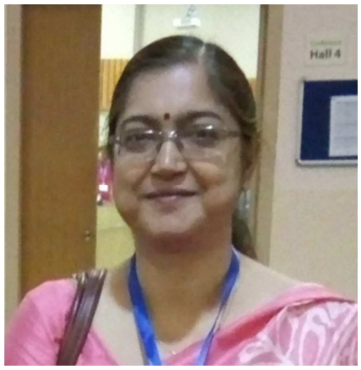
Curriculum Vitae

Name: DR. SARBARI GUHA



Affiliation: Department of Physics,
St. Xavier's College (Autonomous),
Kolkata-700016
Designation: Associate Professor;
Head (2007-2010);
E-mail: guha@sxccal.edu;
srayguha@yahoo.com

Research Field: General Relativity, Cosmology, Relativistic Astrophysics

B. Sc. (Hons. in Physics), CU (1987) with FIRST CLASS
M. Sc. in Physics from CU (1989, exam held in 1990) with FIRST CLASS
Ph.D. (Sc.) in General Relativity and Cosmology, University of Kalyani (2000).

Research Experience (After Ph.D.)

After my Ph.D., I continued my research on Global Differential Geometric methods in General Relativity and Cosmology. During my **one year stay** in the **Department of Physics, Queen's University, Kingston, Canada** (2004-2005) as a **Visiting Research Fellow,** I worked as a member of the research group in **Astronomy, Astrophysics and Relativity (QUARG) with Professor Kayll Lake.** I am a **Visiting Associate of IUCAA** from 2006 onwards. In October 2018, I visited UKZN, Durban, South Africa, and presently I collaborate with **Prof. Rituparno Goswami** of the Astrophysics and Cosmology Research Unit (ACRU) of UKZN. In September 2019, I visited the Mathematical Institute of Serbian Academy of Sciences and Arts, Belgrade.

Awards and Distinctions

(i) **Young Scientist Award** (in **Physics**), at the *Indian Science Congress*, 82nd session, 1995.

(ii) **Certificate** in the *Colloquium of Young Physicists*, Indian Physical Society, 1991.

(iii) **National Scholarship** in Physics Honors in the B.Sc. (Honors) Examination of Calcutta University.

(iv) **State Merit Certificate** in the Madhyamik Examination of West Bengal Board of Secondary Education.

Research Achievements and Some Visits abroad

i. **Principal Investigator,** CSIR Major Research Project entitled "*Universal Thermodynamics in Modified Theories of Gravity*", with effect from 01/05/2018 and continuing.
ii. **Principal Investigator**, UGC Minor Research Project entitled "A *Study of the Dynamics of the Universe: theory vis-à-vis the recent observational data*", with effect from December 20, 2006 to December, 2008 (PSW -059/06-07 (ERO) dated 06 Nov 2006). Completed.
iii. **Invited speaker and Member of the International Scientific committee** at the International Symposium on **"*Nonlinear Dynamics*"** organized by the Mathematical Institute of the Serbian Academy of Sciences and Arts, in Belgrade, September 2019**.**

Presented an Invited paper entitled "*Non-Linear Dynamical Systems in General Relativity and Cosmology*", at the International Symposium on **"*Nonlinear Dynamics*"**, Belgrade, Serbia, 04-06 September 2019.

Delivered an Invited Lecture on "Some Aspects of General Relativity and Cosmology", at the Mathematical Institute of Serbian Academy of Sciences and Arts, Belgrade, on September 09, 2019.

iv. **Attended the second BRICS Symposium on Gravity, Astrophysics and Cosmology, and the 2018 South Africa Gravity Society Meeting** in Durban, South Africa during 22-28 October, 2018. Scientifically interacted with the faculty members, students and postdoctoral fellows at the Astrophysics and Cosmology Research Unit (ACRU), School of Mathematics, Statistics and Computer Sciences, University of KwaZulu-Natal, Durban, South Africa, 29-31 October, 2018.

Presented a paper entitled "*Non-adiabatic spherical collapse in f(R,T) theory of gravity*", at the BRICS Symposium on Gravity, Astrophysics and Cosmology, Durban, South Africa, 22 – 26 October 2018.

Delivered an Invited Lecture on *"Thermodynamic analysis and the generalized second law in some Chaplygin gas models"*, at the School of Mathematics, University of KwaZulu-Natal, Durban, South Africa, on October 30, 2018.

Scientifically interacted with the faculty members, students and postdoctoral fellows at the Astrophysics and Cosmology Research Unit (ACRU), School of Mathematics, Statistics and Computer Sciences, University of KwaZulu-Natal, Durban, South Africa, 29-31 October, 2018. Officiated as the External examiner for the Honours students' presentations of the Department of Maths and Applied Maths, University of KwaZulu-Natal, Durban, South Africa, on 31st October 2018.

v. **Visiting Associate of IUCAA** from August, 2006 onwards.

vi. **Post-Doctoral Research Fellow** in the **Department of Physics, Queen's University, Kingston, CANADA**, as a member of the research group in **Astronomy, Astrophysics and Relativity,** from October 1, 2004 to September 30, 2005. Post-doctoral advisor: **Professor Kayll Lake.**

vii. Member of **International Advisory Committee** of the ***International*** *Conference on Theoretical Physics* at the University of Nis, Yugoslavia in August 2003.

viii. **Chairperson** of a technical session at the **6th International Conference on Differential Geometry** organized by the TENSOR Society of Japan at Tokyo in August, 2002.

Invited talks abroad

- Invited Talk, "Some Aspects of General Relativity and Cosmology", at the Mathematical Institute of Serbian Academy of Sciences and Arts, Belgrade, on September 09, 2019
- Invited Talk, *"Thermodynamic analysis and the generalized second law in some Chaplygin gas models"*, School of Mathematics, University of KwaZulu-Natal, Durban, South Africa, October 30, 2018.
- Invited Talk, "*On Some Space-times of General Relativity*", Department of Physics, Queen's University, Kingston, Canada, August 06, 2004.
- Invited Talk, *"On fluid Pseudo Ricci Symmetric space-time of general relativity"* during the **6th International Conference of Tensor Society on Differential Geometry & Its Applications**, at the Tensor Society of Japan, Tsukuba, August 5-9, 2002.
- Invited Talk, "*On Quasi Einstein and Generalized Quasi Einstein Manifolds and their applications*" during the **International Conference on Theoretical Physics** held at the **University of Nis, Yugoslavia** in August, 2003.

International Collaborations

- UKZN, Durban, South Africa.
- Queen's University, Kingston, Ontario, Canada

Professional/Administrative Activities

- **Head** of the Department of Physics at St. Xavier's College, Kolkata during 2007-2010.
- During her tenure as the HOD, she initiated the publication of the annual departmental magazine **HORIZON** and the annual seminar of the department, named as **SPECTRUM.**
- Initiated and coordinated the **J. C. Bose Memorial Lecture** at St. Xavier's College during the 150th birth anniversary of Sir J. C. Bose.
- **Guest lecturer at the Department of Physics, Jadavpur University** from 2014 to 2017, at the master's level.
- **Editor** of the Physics Department magazine, Horizon in 2009, **Associate Editor** in 2010, 2014, 2017, 2018, 2019-2020 (combined volume), 2021, 2022 and 2023.
- **Teacher-in-charge** of the entire Laboratory of the Department during the period **2003 to 2004 till she left for Canada in 2004 for a sabbatical**.
- **Local Coordinator,** The Vaidya-Raychaudhuri Lecture, St. Xavier's College (Kolkata), 14th November, 2011. Speaker: Professor Sanjeev Dhurandhar.
- Member, Organizing Committee, ***National Seminar on Applications of Statistics in Natural Sciences,*** organized by St. Xavier's College (Autonomous), Kolkata and IUCAA Centre for Astronomy Research and Development, Kolkata, December 16th – 17th, 2019.
- Member, Scientific Advisory committee, ***Gravity, Cosmology and Raychaudhuri's Equation*****, National Workshop to** celebrate the birth centenary of Late Professor Amal Kumar Raychaudhuri, March 13-14, 2024, Jadavpur University.
- Member, Organizing Committee, ***National Seminar on History and Philosophy of Science,*** in honor of Late Professor M.C. Chaki's 99th Birth Anniversary, July 2nd & 3rd, 2011, Calcutta Mathematical Society.
- Member, Local Organizing Committee, ***International Symposium on Analysis, Manifolds and Mechanics,*** Prof. M. C. Chaki's 90th birth anniversary, M. C. Chaki Centre for Mathematics and Mathematical Sciences, Calcutta, Feb. 5-7, 2003.
- Member, Local Organizing Committee, ***National Seminar on Differential Geometry, Relativity & Astrophysics***, jointly organized by St. Xavier's College, Birla Planetarium, & Dept. of Pure Mathematics, Calcutta University Nov.12-14, 1992.

Experience of Ph.D. Supervision

1. Mr. Pinaki Bhattacharya, awarded Ph.D. degree from Jadavpur University in January 2017.
2. Samarjit Chakraborty, Thesis submitted in St. Xavier's College (Autonomous), Kolkata
3. Sucheta Datta, Predoc seminar completed in St. Xavier's College (Autonomous), Kolkata.
4. Uttaran Ghosh, Registered in St. Xavier's College (Autonomous), Kolkata.
5. Shamima Khan, enrolled in St. Xavier's College (Autonomous), Kolkata.
6. Simon Murmu, enrolled in St. Xavier's College (Autonomous), Kolkata.

Ph.D. Thesis Examined

1. **P. R. Dhongle, "The Space-times in Constant Gravitational Fields in General Relativity", Dept. of Mathematics, R. T. M. Nagpur University, 2014**
2. **P. Bhattacharya, "On some investigations of Cosmological Solutions and Geodesic Motions in Braneworld Scenario", Department of Physics, Jadavpur University, 2016.**
1. **S. Chakraborty, "On The Thermodynamic Aspects Of Gravity", 2023.**

Membership of Professional bodies

- Life Member, Indian Association for General Relativity and Gravitation.
- Life Member, Astronomical Society of India.
- Life Member, Indian Physical Society.

- Life Member, Indian Science Congress Association.
- Life Member, Calcutta Mathematical Society.

Reviewership of Journals

Reviewer of Classical and Quantum Gravity (IOP Science)
Reviewer of Physics Scripta (IOP Science)
Reviewer of European Physical Journal Plus (Springer)
Reviewer of Scientific Reports (Springer)
Reviewer of European Journal of Physics (IOP Science)
Reviewer of Entropy – a MDPI Journal
Reviewer of Foundations of Physics (Springer)
Reviewer of Modern Physics Letters A (World Scientific)
Reviewer of Gravitation and Cosmology (Russian Gravitational Society, Springer)
Reviewer of Canadian Journal of Physics (Canadian **Science** Publishing)
Reviewer of International Journal of Theoretical Physics (Springer)
Reviewer of Pramana – Journal of Physics (Indian Academy of Sciences, Springer)
Reviewer of Advances in High Energy Physics (Hindawi)
Reviewer of Indian Journal of Physics (Indian Association for the Cultivation of Science, Springer)
Reviewer of Thai Journal of Physics
Reviewer of MATHEMATICAL REVIEWS

RECENT PREPRINTS AND BACKGROUND PAPERS

1. **Samarjit Chakraborty, Sunil D. Maharaj, Sarbari Guha, and Rituparno Goswami,** arXiv:2402.04188v1 [gr-qc]
2. **Sucheta Datta and Sarbari Guha, Memory Effect of Gravitational Wave Pulses in PP-Wave Spacetimes, arXiv:2309.06208 [gr-qc] (2023)**
3. **Sarbari Guha, From entropy to gravitational entropy, arXiv: 2306.04172 [gr-qc] (2023)**
4. **Sucheta Datta, Sarbari Guha and Deeshani Mitra (**arXiv:2212.06794v1**)**
5. **Uttaran Ghosh and Sarbari Guha (**arXiv:2211.08753v2 [gr-qc]**)**
6. **Samarjit Chakraborty, Sarbari Guha, and D. Panigrahi,** (arXiv:1906.12185 [gr-qc])

PUBLICATION IN INTERNATIONAL JOURNALS

1. Sucheta Datta, **Sarbari Guha** and Samarjit Chakraborty**,** *On the Propagation of Gravitational Waves in Matter-filled Bianchi I Universe***,** Int. J. Theor. Phys. doi:10.1007/s10773-023-05463-0 (2023)
2. Samarjit Chakraborty**, Sarbari Guha,** and Rituparno Goswami**,** *How appropriate are the gravitational entropy proposals for traversable wormholes?* **General Relativity and Gravitation,** Vol. 54, (**2022**) pp. 47.
3. Samarjit Chakraborty and **Sarbari Guha**, *Density Perturbation and Cosmological Evolution in the Presence of Magnetic Field in f*(*R*) *Gravity Models,* **Advances in High Energy Physics**, Vol. 2022, Article ID 5195251
4. Sucheta Datta **and Sarbari Guha,** *Propagation of Axial and Polar Gravitational Waves in Kantowski-Sachs Universe,* **Physics of the Dark Universe**, Vol. 34 (2021) 100890.
5. **Sarbari Guha** and Uttaran Ghosh**,** *Dynamical conditions and causal transport of dissipative spherical collapse in f(R, T) gravity*, **European Phys. J. Plus**, Vol. 136, (2021) 460.
6. Samarjit Chakraborty**, Sarbari Guha,** and Rituparno Goswami**,** *An investigation on gravitational entropy of cosmological models*, **International Journal of Modern Physics D**, Vol. 30, (2021) 2150051.

7. **Sarbari Guha** and Sucheta Datta, *Axial Gravitational Waves in Bianchi I Universe*, **International Journal of Modern Physics D,** Vol. 29, (2020) 2050116.
8. **Sarbari Guha** and Samarjit Chakraborty, *On the gravitational entropy of accelerating black holes*, **International Journal of Modern Physics D,** Vol. 29, (**2020**) pp. 2050034.
9. Samarjit Chakraborty and **Sarbari Guha**, *Thermodynamics of FRW universe with Chaplygin gas models*, **General Relativity and Gravitation,** Vol. 51, (**2019**) pp. 158.
10. **Sarbari Guha** and Pinaki Bhattacharya, *Five-dimensional warped product space-time with time-dependent warping and a scalar field in the bulk*, **Gravitation and Cosmology,** Vol. 24, (**2018**) pp. 274-284
11. Pinaki Bhattacharya and **Sarbari Guha**, *Particle Motion and Perturbed Dynamical System in Warped Product Spacetimes*, Int. J. Theor. Phys., 55 (**2016**) pp. 3375–3392,
12. **Sarbari Guha** and Ranajoy Banerji, *Dissipative Cylindrical Collapse of Charged Anisotropic Fluid*, Int. J. Theor. Phys., 53 (**2014**) pp. 2332-2348. DOI 10.1007/s10773-014-2033-9
13. **Sarbari Guha** and Pinaki Bhattacharya, *Gravity in five-dimensional warped product spacetimes with time-dependent warp factor,* Journal of Physics: Conference Series 484 (**2014**) 012015-5
14. **Sarbari Guha**, Pinaki Bhattacharya and Subenoy Chakraborty, *Particle motion in the field of a five-dimensional charged black hole*, Astrophys. Space Sci. 341 (**2012**) 445–455
15. **Sarbari Guha** and Pinaki Bhattacharya, *Geodesic Motions near a Five-dimensional Reissner–Nordström Anti-de Sitter black hole,* Journal of Physics: Conference Series 405 (**2012**) 012017-4.
16. Pinaki Bhattacharya and **Sarbari Guha,** *A Dynamical Systems Analysis of Motion in the Bulk with respect to the Brane,* Physica Scripta, 85 (2012) 025001-8
17. **Sarbari Guha** and Subenoy Chakraborty, *Five-Dimensional Warped Product Space-Time with Time-Dependent Warp Factor and Cosmology of the Four-Dimensional Universe*, Int. J. Theor. Phys., 51 (**2012**) 55–68
18. **Sarbari Guha** and Subenoy Chakraborty, *Brane Cosmology and Motion of Test Particles in Five-Dimensional Warped Product Spacetimes*, Gen. Relativ. Gravit., 42 (**2010**) 1739–1754
19. **Sarbari Ray-Guha**, *On Perfect Fluid Pseudo Ricci Symmetric Space-time,* TENSOR N.S., Vol. 67, No. 1 (2006), pp. 101-107.
20. **Sarbari Ray-Guha**, *Space-Times admitting vanishing projective curvature tensor,* TENSOR N.S., Vol.65, No.3 (2004), pp. 272-276.
21. **Sarbari Guha**, *On Quasi Einstein and Generalized Quasi Einstein Manifolds and their applications,* FACTA UNIVERSITATIS, Ser: Mech. Auto. Control & Rob. Vol. 3, No.14 (2003), pp. 821-842.
22. **Sarbari Guha**, *On a Perfect Fluid Space-Time with Quasi-Conformal Curvature Tensor,* FACTA UNIVERSITATIS, Ser: Mech. Auto. Control & Rob. Vol. 3, No.14 (2003), pp. 843-849.
23. M. C. Chaki and **Sarbari Ray-Guha**, *On a type of space-time of General Relativity,* TENSOR N.S., Vol.64, No. 3 (2003), pp.227-231.
24. **Sarbari Ray-Guha**, *On fluid Pseudo Ricci Symmetric space-time of general relativity,* TENSOR N.S., Vol.63, No. 3 (2002) pp. 252-257.
25. **Sarbari Ray**, *On a Type of General Relativistic Perfect Fluid Space-Time with Divergence-free Projective Curvature Tensor,* TENSOR N.S., Vol.61, No.2 (1999), pp.176-180.
26. B. Chaki, **Sarbari Ray** and A. Konar, *On Chaki Pseudo Symmetric Perfect Fluid Space-Time,* Bulgarian Journal of Physics, Vol.26, Nos. 5/6, (1999), pp.204-209.
27. M.C. Chaki and **Sarbari Ray,** *Space-Times with Covariant-Constant Energy- Momentum Tensor,* International Journal of Theoretical Physics, Vol.35, No.5, (1996), pp.1027-1032.

CONFERENCE PROCEEDINGS AT THE NATIONAL LEVEL

1. **Sarbari Ray** and B. Chaki, "A type of homogeneous pure radiation in a Pseudo Ricci Symmetric Space-time," *Proc. Nat. Seminar on Mathematical Modeling*, **Jadavpur University**, March 7-8, 1994, Vol. 2, pp. 97-104.

2. **Sarbari Ray** and B. Chaki, "On some homogeneous weak plasma pure radiation field in a Pseudo Ricci Symmetric Space-time," ***Proceedings of Saha centenary Symposium*** *on Plasma Science and Technology (PLASMA 93)*, Dept. of Physics, **Allahabad University**, Oct. 11-14, 1993, pp.239-242.
3. B. Chaki and **Sarbari Ray**, "Four-Dimensional Cosmological model with shear-free perfect fluid in a Pseudo Ricci Symmetric Space-time," *Proc. Colloquium of Young Physicist,* Organized by **Indian Physical Society**, Physics Teacher, 1991, Vol. 33, pp. 115-117.

FEATURE ARTICLES IN JOURNALS / MAGAZINES

1. **Sarbari Ray-Guha "*PROF. M. C. CHAKI and M. C. Chaki Centre for Mathematics and Mathematical Sciences, Calcutta*", FACTA UNIVERSITATIS,** Series: **Mechanics, Automatic Control and Robotics** Vol.3, No 13, 2003, pp. 779 – 780
2. **Sarbari Guha, "*Professor Manindra Chandra Chaki: A Memoir"***, Ganitacharya Manindra Chandra Chaki, Janma Shatabarsha Smarak, published by M. C. Chaki Centre of Mathematics and Mathematical Sciences, July 2012, pp. 90-92.
3. **Sarbari Guha,** "***From Quantum Theory to Gravitational Waves: Einstein's Legacy***", PEBBLES, Science Magazine of St. Xavier's college, Kolkata, 2016.
4. **Sarbari Guha,** "*Stephen Hawking: The Indomitable Mind*", HORIZON, Annual Magazine of Physics Department, St. Xavier's college, Kolkata, 2017-2018.

PAPERS PRESENTED IN CONFERENCES

1) International : date, place and the title of the paper

1. Sucheta Datta and **Sarbari Guha**, "*Memory Effect of Gravitational Wave Pulses in PP-Wave Spacetimes*", International Conference on Gravitation and Cosmology (ICGC 2023), IIT Guwahati, 6th to 9th December, 2023.
2. Samarjit Chakraborty, Sunil D. Maharaj, **Sarbari Guha**, and Rituparno Goswami, "*Testing the Weyl Proposal of Gravitational Entropy in gravitationa collapse*" International Conference on Gravitation and Cosmology (ICGC 2023), IIT Guwahati, 6th to 9th December, 2023.
3. **Sarbari Guha,** "*Generalized Second Law of Thermodynamics in FRW Universe with Chaplygin Gas Models*", International Conference on Gravitation and Cosmology (ICGC 2019), IISER Mohali, 10th to 13th December, 2019.
4. **Sarbari Guha** and Samarjit Chakraborty, "*Gravitational entropy of accelerating black holes"*, International Conference on Gravitation and Cosmology (ICGC 2019), IISER Mohali, 10th to 13th December, 2019.
5. Samarjit Chakraborty, **Sarbari Guha**, and Rituparno Goswami, "*An investigation on gravitational entropy of cosmological models*", International Conference on Gravitation and Cosmology (ICGC 2019), IISER Mohali, 10th to 13th December, 2019.
6. Sucheta Datta and **Sarbari Guha**, "*Propagation of Gravitational Waves in Anisotropic Universe*", International Conference on Gravitation and Cosmology (ICGC 2019), IISER Mohali, 10th to 13th December, 2019.
7. **Sarbari Guha,** "*Non-Linear Dynamical Systems in General Relativity and Cosmology*", International Symposium on **"*Nonlinear Dynamics*"**, Belgrade, Serbia, 04-06 September 2019.
8. **Sarbari Guha,** "*Non-adiabatic spherical collapse in f(R,T) theory of gravity*", BRICS Symposium on Gravity, Astrophysics and Cosmology, Durban, South Africa, 22 – 26 October 2018.

9. **Sarbari Guha** and Sukanta Das, *"Noether Symmetry Analysis of FRW model in presence of generalised scalar-gravity interaction"*, International Conference on Post-Planck Cosmology: Enigma, Challenges and Visions, IUCAA, Pune, 9th – 12th October, 2017.
10. **Sarbari Guha,** *"Warped Product space-time with time-dependent warping and a scalar field in the bulk"* at the 29th meeting of Indian Association of General Relativity and Gravitation, IIT Guwahati, 18th – 20th May, 2017.
11. **Sarbari Guha** and Pankaj Joshi**, "***Bouncing models in perfect fluid collapse***",** *International Conference on Recent Advances in Mathematics* (ICRAM 2014), Department of Mathematics, Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur, 20th - 23rd January, 2014.
12. **Sarbari Guha,** "***Geometrical dark energy in braneworlds from time-dependent warp factor***" Physical Sciences Section of 100th Indian Science Congress, Kolkata, January 03-07, 2013.
13. **Sarbari Guha, "***Warped Product Space-Times and Localization of Gravity***",** *The 12th International Conference On Differential Geometry and its Applications And Informatics Besides,* organized by University of Calcutta and Tensor Society of Japan, Calcutta, 17th to 21st December, 2012.
14. **Sarbari Guha,** Pinaki Bhattacharya and Subenoy Chakraborty, "*Geodesic Motions near a five-dimensional Reissner-Nordstr¨om Anti-de Sitter black hole", International Conference On Modern Perspectives Of Cosmology And Gravitation*, Indian Statistical Institute, February 7 - 11, 2012.
15. Pinaki Bhattacharya and **Sarbari Guha,** *"Particle confinement and perturbed dynamical system in warped product space-time", International Conference On Modern Perspectives Of Cosmology And Gravitation*, Indian Statistical Institute, February 7 - 11, 2012.
16. **Sarbari Guha,** *"A dynamical systems study of various cosmological models: critical points and nature of geodesics", International Conference on Dynamical Systems: Theory and Applications,* Jadavpur University, Calcutta, January 11-14, 2012.
17. **Sarbari Guha** and Pinaki Bhattacharya, "*Gravity in Five-dimensional Warped Product Spacetimes with time-dependent warp factor", International Conference on Gravitation and Cosmology* [ICGC2011], December 14-19, 2011 GOA, India.
18. **Sarbari Guha, "***Confinement of Particles In Submanifolds Embedded In Warped Product Spaces," International Symposium on Recent Advances in Mathematics and its Applications (ISRAMA 2008),* Calcutta Mathematical Society, Calcutta, Dec. 19-21, 2008.
19. **Sarbari Ray-Guha**, "Generalized Quasi Einstein Manifold and its Application to General Relativity," *International Symposium on Recent Advances in Mathematics and its Applications (ISRAMA 2003),* Calcutta Mathematical Society, Calcutta, Dec. 20-22, 2003.
20. M. C. Chaki and **Sarbari Ray-Guha,** "Conformally flat perfect fluid Pseudo Ricci Symmetric space-time," *International Symposium on Analysis, Manifolds and Mechanics,* Prof. M. C. Chaki's 90th birth anniversary, M. C. Chaki Centre for Mathematics and Mathematical Sciences, Calcutta, Feb. 5-7, 2003
21. **Sarbari Ray-Guha**, "On fluid Pseudo Ricci Symmetric space-time of general relativity," The 6th *International Conference On Differential Geometry and its Applications,* Tensor Society of Japan, Tsukuba, Japan, Aug. 5-9, 2002.
22. **Sarbari Ray**, "On fluid generalized Pseudo Ricci Symmetric space-time of general relativity," *International Symposium on Mathematics and its Applications (ISMA 2001),* Calcutta Mathematical Society, Calcutta, Feb. 17-19, 2001.
23. **Sarbari Ray**, "On a type of general relativistic perfect fluid space-time," *5th International Conference On Differential Geometry and its Applications,* organized by University of Calcutta and Tensor Society of Japan, Calcutta, Dec. 21-25, 1998.
24. **Sarbari Ray** and B. Chaki, "On a type of Pseudo Ricci Symmetric cosmological string universe," *International Symposium on M. N. Saha, S. N. Bose and N. R. Sen: Contributions to Astrophysics and Impact*, Nov. 28-30, 1995.

2) National: date, place and the title of the paper

1. **Sarbari Guha**, "*Gravitational entropy of accelerating black holes and traversable wormholes",* 32nd meeting of the IAGRG, IISER Kolkata, December 19-21, 2022.
2. **Samarjit Chakraborty, Sarbari Guha and Rituparno Goswami,** "*An investigation on gravitational entropy of cosmological models"* 32nd meeting of the IAGRG, IISER Kolkata, December 19-21, 2022.
3. **Sucheta Datta, Sarbari Guha and Samarjit Chakraborty,** "*Propagation of Axial and polar gravitational waves in matter-filled Bianchi I Universe*" 32nd meeting of the IAGRG, IISER Kolkata, December 19-21, 2022.
4. **Uttaran Ghosh and Sarbari Guha**, *Vaidya-like exterior solution and formation of singularity in f(R; T) theory of gravity"* 32nd meeting of the IAGRG, IISER Kolkata, December 19-21, 2022."
5. **Suchata Datta, Sarbari Guha and Deeshani Mitra,** "*Memory effect of gravitational wave pulses in pp-wave spacetimes",* 32nd meeting of the IAGRG, IISER Kolkata, December 19-21, 2022."
6. **Sarbari Guha** and Uttaran Ghosh*," Dynamical conditions and causal transport of spherical collapse in $f(R,T)$ gravity"* 21st National Space Science Symposium, 31st January – 4th February, 2022, IISER Kolkata.
7. Samarjit Chakraborty and **Sarbari Guha***," Density perturbation and cosmological evolution in the presence of magnetic field in $f(R)$ gravity models"* 21st National Space Science Symposium, 31st January – 4th February, 2022, IISER Kolkata.
8. Sucheta Datta and **Sarbari Guha**, "*Axial and Polar Gravitational Waves in Kantowski-Sachs Universe"*, 21st National Space Science Symposium, 31st January – 4th February, 2022, IISER Kolkata.
9. **Sarbari Guha,** *"On the gravitational entropy of traversable wormholes"* National Seminar on Recent Advances in Astrophysics and Cosmology, IUCAA Centre for Astronomy Research and Development (ICARD) , Physics Department, North Bengal University March 24-25th, 2021.
10. **Sarbari Guha** and Sucheta Datta**,** *"Propagation of Axial Gravitational Waves in Bianchi I Universe"*, ***31st meeting of the IAGRG (Online)****,* IIT Gandhinagar, during December3-5, 2020.
11. Samarjit Chakraborty and **Sarbari Guha,** *"*Gravitational entropy of accelerating black holes and traversable wormholes*"*, ***31st meeting of the IAGRG (Online)****,* IIT Gandhinagar, during December 19-20, 2020.
12. **Sarbari Guha,** *"Universal Thermodynamics with Chaplygin gas models"*, ***30thth meeting of the IAGRG*** *,*BITS-Pilani Hyderabad, during January 3-5, 2019.
13. Samarjit Chakraborty, **Sarbari Guha** and Dibyendu Panigrahi**,** *"Evolution of FRW universe in variable modified Chaplygin gas model"*, ***30thth meeting of the IAGRG*** *,*BITS-Pilani Hyderabad, during January 3-5, 2019.
14. Sukanta Das and **Sarbari Guha,** *"Noether Symmetry Analysis of anisitropic universe in presence of non-minimally coupled ttachyon field"*, ***30thth meeting of the IAGRG*** *,*BITS-Pilani Hyderabad, during January 3-5, 2019.
15. **Sarbari Guha,** *"Warped product space-time with time-dependent warping and a scalar field in the bulk"*, ***29th meeting of the IAGRG*** *,*IIT Guwahati, during May 18-20, 2017.
16. **Sarbari Guha**, and Ranajoy Banerji, "*Study of charged radiating cylindrical collapse of anisotropic fluid with shear*", ***27th meeting of the IAGRG****,* H. N. Bahuguna Garhwal University, Garhwal, Srinagar during March 7-9, 2013.
17. Pinaki Bhattacharya and **Sarbari Guha**, "*Time and extra dimension dependent scalar field in the bulk "*, ***27th meeting of the IAGRG****,* H. N. Bahuguna Garhwal University, Garhwal, Srinagar during March 7-9, 2013.
18. **Sarbari Guha**, Pinaki Bhattacharya and Subenoy Chakraborty, "*Five-dimensional Warped Product Spacetimes with time-dependent warp factor and cosmology of the braneworld*", ***26th meeting of the IAGRG****,* Harish-Chandra Research Institute, Allahabad, January 19-21, 2011.

19. Pinaki Bhattacharya and **Sarbari Guha**, "*Dynamical Characteristics and Geodesic Deviations in Warped Product Space Time*", ***26th meeting of the IAGRG,*** Harish-Chandra Research Institute, Allahabad, January 19-21, 2011.
20. **Sarbari Guha** and Subenoy Chakraborty, *"Brane Cosmology and Motion of Test Particles in Five-Dimensional Warped Product Spacetimes,"* ***25th meeting of the IAGRG,*** Saha Institute of Nuclear Physics, January 28-31, 2009.
21. **Sarbari Guha**, "*Phase Portrait of Many Component FLRW models*," Conference cum Seminar on the ***Emerging Trends in Physics,*** **SGTB Khalsa College**, University of Delhi, September 20-23, 2006.
22. **Sarbari Guha**, "*On the Flatness Problem and FLRW models*," Nat. Seminar on Advances in Mathematics and Applications, **Department of Mathematics, University of Burdwan**, Burdwan, Jan. 18-20, 2006.
23. **Sarbari Ray**, "On a type of general relativistic perfect fluid space-time," *Proc. 82nd Indian Science Congress*, Part II, **Young Scientist** Abstracts, p.8., 1995.
24. **Sarbari Ray** and B. Chaki, "A type of homogeneous pure radiation in a Pseudo Ricci Symmetric Space-time," *Proc. Nat. Seminar on Mathematical Modeling*, **Jadavpur University**, March 7-8, 1994, Vol. 2, pp. 97-104.
25. **Sarbari Ray** and B. Chaki, "On some homogeneous weak plasma pure radiation field in a Pseudo Ricci Symmetric Space-time," ***Proceedings of Saha centenary Symposium*** *on Plasma Science and Technology (PLASMA 93)*, Dept. of Physics, **Allahabad University**, Oct. 11-14, 1993, pp.239-242.
26. B. Chaki and **Sarbari Ray**, "A free-free anisotropic spatially homogeneous bulk viscous cosmological model in a Pseudo Ricci Symmetric Space-time of General Relativity," *Nat. Seminar on Differential Geometry, Relativity and Astrophysics,* in memory of Rev. Father Goreux, Calcutta, Nov. 12-14, 1992.
27. B. Chaki and **Sarbari Ray**, "Static shear-free perfect flow in a Pseudo Ricci Symmetric Space-time of General Relativity," *Nat. Seminar on Mathematics,* **Dept. of Pure Mathematics, University of Calcutta**, Dec. 18-20, 1991.
28. B. Chaki and **Sarbari Ray**, "Four-Dimensional Cosmological model with shear-free perfect fluid in a Pseudo Ricci Symmetric Space-time," *Proc. Colloquium of Young Physicist,* Organized by **Indian Physical Society**, Physics Teacher, 1991, Vol. 33, pp. 115-117.
29. B. Chaki and **Sarbari Ray**, "On some properties of a shear-free perfect flow in a Pseudo Ricci Symmetric Space-time," *Proc. 78th Indian Sc. Congress*, Indore, 1991, Part III (Abstracts), p.46.

3) Regional: date, place and the title of the talk

1. **Sarbari Guha**, "An Interesting Feature of Perfect Fluid Collapse", Topical Conference on Gravity and Cosmology - Eastern Region, Presidency University, August 9th, 2014.

Seminar Lectures / Invited Talks in India

1. Invited Lecture "Thermodynamic Aspects of Black Hole Formation in Gravitational Collapse", National Workshop on Gravity, Cosmology and Raychaudhuri's Equation, Jadavpur University, March 13-14, 2024.
2. GW group lecture "On the Propagation of Axial and Polar Gravitational Waves" Gravitational Wave group meet, IUCAA, Pune, June 28, 2022.
3. ``Gravitational Waves: The Reality and The Myth'', National Science Day Celebration 2022 (NSDC-2022), 6th March 2022, organized by Bhatter College, Paschim Medinipur in collaboration with Dept. of Physics, Barasat Government College.
4. Special Lecture "Gravitational Waves: The new messenger of the Universe", One Day Lecture, 2nd July, 2021, organized by the Department of Mathematics & Physics, Rabindra Mahavidyalaya, Champadanga, Hooghly, West Bengal.

5. Invited Seminar Lecture "The problem of Gravitational Entropy", One-Day State level meeting, Relativity & Cosmology Research Centre, Department of Physics, Jadavpur University, 6th March 2020.
6. Invited Seminar Lecture "Status of the Generalized Second Law of Thermodynamics in Chaplygin gas models", One-Day State level meeting, Relativity & Cosmology Research Centre, Department of Physics, Jadavpur University, March 15, 2019.
7. Colloquium lecture "Gravitational Collapse", Presidency University, February 13, 2019.
8. Seminar Lecture "Dissipative Collapse in Modified Theories of Gravity", IUCAA, Pune, June 26, 2018.
9. Invited Lecture at Vivekananda College, Thakurpukur, Kolkata, 6th April 2018, "The Life and Works of Stephen William Hawking"
10. Resource Person in the UGC DSA program at the Department of Physics, Jadavpur University, 4th January 2018, "Revisiting the Fundamentals of Electronic Devices".
11. Invited Talk at National Workshop "CELEBRATING THE CENTENARY OF EINSTEIN'S GENERAL RELATIVITY-2017: Hundred Years with 'Λ' (CCEGR-2017)", Department of Mathematics, The University of Burdwan, 27th July, 2017, "General Relativity: Why and How".
12. Resource Person in the TEQIP Program at Narula Institute of Technology, 9th March, 2017, "From Continuum to Quantum".
13. Resource Person at DST Inspire Science Camp, ODGI Engineering College, Howrah, 13th July 2016, "Sir Albert Einstein and His Works".
14. Seminar Lecture, "Some Results In Modified Gravity Theories", IUCAA, Pune, June 21, 2016.
15. Resource Person at the Refresher Course in Physics (June 18 – July 09, 2013), Academic Staff College, University of Calcutta. Topic: Gravitational Collapse.
    Date & Time: **June 21, 2013** at 12:00 noon.
16. Seminar Lecture, "*A Study of the cylindrical collapse of charged fluid in presence of dissipative effects*", IUCAA, Pune, June 04, 2013.
17. Seminar Lecture, "Five dimensional gravity with time dependent warp factor", Relativity and Cosmology Research Centre, Jadavpur University, September **04, 2012.**
18. Seminar Lecture, "Five-dimensional bulk with a time-dependent warp factor and its consequences on brane cosmology", Relativity and Cosmology Research Centre, Jadavpur University, September 14, 2010.
19. Invited Talk, "*Exploring General Relativistic Space-times through the study of geodesics*", IUCAA Reference Centre, Department of Statistics, University of Calcutta, November 14, 2009.
20. Invited Talk, "*The Geometric description of Physics*", Centre for Advanced Studies in General Relativity and Cosmology, Jadavpur University, October 20, 2009.
21. Invited Talk, "*On the Embedding of Four-Dimensional Hypersurfaces"* Seminar on the occasion of the 96th Birth Anniversary of Prof. M. C. Chaki, Calcutta Mathematical Society, July 01, 2008.
22. Seminar Lecture, "*A brief review of the work on Embedding Problems*", IUCAA, Pune, June 08, 2007.
23. Invited Talk, "*Dark Energy and ISW Effect"*, Centre for Advanced Studies in General Relativity and Cosmology, Jadavpur University, March 07, 2006.
24. Invited Talk, "*Time-evolution of a three-component FLRW model"*, Centre for Advanced Studies in General Relativity and Cosmology, Jadavpur University, January 10, 2006.
25. Invited Talk, "*On Some Type of General Relativistic Space-times*", Centre for Advanced Studies in General Relativity and Cosmology, Jadavpur University, March 09, 2004.
26. Seminar lecture, "*General Relativity: Why and How*", St. Xavier's College, February 10, 2001.
27. Invited Talk, "*On Conformally Symmetric Space-times*", Centre for Advanced Studies in General Relativity and Cosmology, Jadavpur University, July 31, 2001.

Teaching Experiences

(a) Under-graduate Level: St. Xavier's College, Kolkata. Years of Experience: 32 Yrs.
(b) Post-graduate Level: St. Xavier's College (Autonomous), Kolkata (the PG courses started in 2007). Years of Experience: 16 Yrs.