

SAMIR K. BOSE

PROFESSOR OF PHYSICS

**AT NOTRE DAME
SINCE 1966**

BORN: May 1, 1934

AT: Dhaka, Bangladesh

Delhi University; 1958; M.S.
University of Rochester; 1962; Ph.D.

Research Associate, University of Rochester, Summer 1962
Member Institute for Advanced Study, Princeton, 1962-63
Fellow, Tata Institute of Fundamental Research, Bombay, 1963-64
Reader, Delhi University, Delhi, 1964-66
UNESCO Consultant, International Center for Theoretical Physics, Trieste, 1966
Assistant Professor, University of Notre Dame, 1966-68
Associate Professor, University of Notre Dame, 1968-1990
Visiting Scientist, Delhi University, Summer 1972
Visiting Associate Professor, Indian Institute of Technology, Kanpur, 1976-77
Guest lecturer, Physical Research Laboratory, Ahmedabad, 1977
Guest lecturer, Delhi University, 1977
Visiting Associate Professor, Ben Gurion University, Beersheva, Summer, 1979
Consultant, Center for Particle Theory, University of Texas at Austin, Summer 1981
Visiting Associate Professor, Mathematics Department, Ben Gurion University, Beersheva, Israel, Summer 1989.
Professor, University of Notre Dame, 1990-present

Research Area

Theoretical Physics

Invited Addresses

Carnegie Institute of Technology, Puttsburgh, (1 lecture), Spring 1962
Theoretical Physics Summer Institute, Simla (4 lectures), 1965
Tata Institute of Fundamental Research, Bombay, (1 lecture) March 1966
University of Rochester, Rochester (1 lecture) March 1967
Syracuse University, Syracuse (1 lecture) March 1967
North Western University, Evanston (1 lecture) April 1971
Delhi University, Delhi (3 lectures) August 1972
Tata Institute, Bombay (1 lecture) August 1972
Physical Research Laboratory, Ahmedabad (3 lectures) January 1977
Delhi University, Delhi (3 lectures) August 1977
VIII International Conference on Group Theory and Mathematical Physics (1 lecture), Austin, Texas, September 1978
Arizona State University, Tempe (1 lecture) April 1979
Ben Gurion University, Beersheva (1 lecture) June 1979

Delhi University (1 lecture) June 1981
Indian Institute of Technology, Kanpur (1 lecture) June 1981
Tata Institute, Bombay (1 lecture) July 1981
Indiana State University, Terre Haute (1 lecture) March 1983
Southern Illinois University, Carbondale (1 lecture) October 1984
Delhi University, Delhi (1 lecture) January 1987
Tata Institute, Bombay (1 lecture) January 1987
Invited Addresses (continued)
Ben Gurion University, Beersheva (1 lecture) May 1989
Delhi University (2 lectures) July 1989
University of Texas, Austin (1 lecture) October 1989
Indiana State University (1 lecture) March 1992
University of Texas, Austin (1 lecture) November 1993
International Symposium on Quantum Systems, Minsk, Belarus, (1 lecture) May 1994
Institute of Theoretical Physics, Kiev, Ukraine (1 informal seminar) June 1994
Illinois State University (1 lecture) October 1994
Delhi University (1 lecture) January 1995

Samir K. Bose

Publications in Refereed Journals

1. "Representations of the Dirac Equation," S.K. Bose, A. Gamba and E.C.G. Sudarshan, Phys. Rev. 113, 1661 (1959).
2. "Form Factor of Neutron From Deuteron Electrodintegration," S.K. Bose, Nuovo Cimento 17, 767 (1960).
3. "Decay Rate of the Neutral Pion," S.K. Bose, Nuovo Cimento 23, 408 (1962).
4. "Pole Approximation of Nonleptonic and Radiative Hyperon Decays With Odd Σ A Relative Parity," S.K. Bose and R.E. Marshak, Nuovo Cimento 23, 356 (1962).
5. "Effect of $\pi\text{-}\pi$ and $K\text{-}\pi$ Resonances on Kaon Form Factor," S.K. Bose, Nuovo Cimento 24, 907 (1962).
6. "Effect of Pion Resonances on the $(\pi^+\text{-}\pi^0)$ and $(K^+\text{-}K^0)$ Mass Difference," S.K. Bose and R.E. Marshak, Nuovo Cimento 25, 527 (1962).
7. "Higher Order Weak Interactions and $(K_1^0\text{-}K_2^0)$ Mass Difference," S.K. Bose, Phys. Letters 2, 92 (1962).
8. "Properties of Deuteron Regge Trajectory and Low-Energy Neutron-Proton Scattering," S.K. Bose and M. Der Sarkissian, Nuovo Cimento 30, 878 (1963).
9. "N* Regge Pole and Pion-Nucleon (3.3) Phase Shifts," S.K. Bose and S.N. Biswas, Phys. Rev. 133, B789 (1964).
10. "Determination of Pion-Nucleon S-Wave Scattering Length by the N/D Method," S.K. Bose and S.N. Biswas, Phys. Rev. 134, B635 (1964).
11. "Unitary Symmetry and $(K_1^0\text{-}K_2^0)$ Mass-Difference in Pole Approximation," S.N. Biswas and S.K. Bose, Phys. Rev. Letters 12 (1964).
12. "Low-Energy KN Interaction and Y_0^* Regge Pole," S.N. Biswas and S.K. Bose, Phys. Rev. 135, B1045 (1964).
13. "Quantum Electrodynamics With Zero Bare Fermion Mass," S.K. Bose and S.N. Biswas, Math. Phys. 6, 1227 (1965).
14. "Calculation of $N^{*++}\text{-}N^{*-}$ Mass-Difference by S-Matrix Methods," S.N. Biswas, S.K. Bose, and L.K. Pande, Phys. Rev. 138, B163 (1965).
15. "Derivation of SU(3) Mass Sum Rules by S-Matrix Methods," S.N. Biswas, S.K. Bose, and L.K. Pande, Phys. Letters 14, 150 (1965).

16. "SU(3) Symmetry $K \rightarrow 2\pi$ Decays, and CP Violation," S.N. Biswas, S.K. Bose, and V.S. Mathur, Phys. Rev. 139, B132 (1965).
17. "Relativistic Extension of SU(6)," S.K. Bose and Yu. M. Shirokov, Phys. Rev. Letters 14, 398 (1965).
18. "Current Algebras and Nonleptonic K-Meson Decays," S.K. Bose and S.N. Biswas, Phys. Rev. Letters 16, 330 (1966).
19. "Electromagnetic Interaction in Static Strong-Coupling Theory," S.K. Bose, Phys. Rev. 145, 1247 (1966).
20. "Relation Between Leptonic and Nonleptonic K-Meson Decays and Current Algebras," S.K. Bose and S.N. Biswas, Nuovo Cimento 43, 1182 (1966).
21. "Equal-Time Commutators and $\eta \rightarrow 3\pi$ Decays," S.K. Bose and A.M. Zimmerman, Nuovo Cimento 43, 1165 (1966).
22. "Meson Baryon Coupling Constants in Broken SU(3) and Algebra of Currents," S.K. Bose and Y. Hara, Phys. Rev. Letters 17, 409 (1966).
23. "Generalized Nonet Representation of SU(3) x SU(3) and Its Applications," S.K. Bose, Phys. Rev. 150, 1231 (1965).
24. "SU(3) x SU(3) Symmetry and the Possible Existence of a Boson 27-plet," S.K. Bose, Nuovo Cimento 46, 419 (1966).
25. "Algebraic Structure Resulting from Superconvergence Relations," S.K. Bose, P.C. DeCelles, and W.D. McGlenn, Phys. Rev. Letters 18, 873 (1967).
26. "Asymptotic Symmetry for Vector Mesons," S.K. Bose and R. Torgerson, Phys. Rev. Letters 19, 1151 (1967).
27. "Meson Symmetries Based on Nonchiral SU(3) x SU(3)," S.K. Bose and E.C.G. Sudarshan, Phys. Rev. 162, 1396 (1967).
28. "Electromagnetic Current in Strong-Coupling Theory," S.K. Bose and W.D. McGlenn, Phys. Rev. 163, 1772 (1967).
29. "Current Algebra, Weinberg Sum Rules, and the $K^+ - K^0$ Mass Difference," C. Early and S.K. Bose, Nuovo Cimento 52A, 305 (1967).
30. "Spectral Function Sum Rules for Non-Conserved Currents and O(4) Symmetry," S.K. Bose and D.S. Loebbaka, Progr. Theor. Phys. (Kyoto) 41, 273 (1969).
31. "Zero-Mass Representation of the Poincare Group and Conformal Invariance," S.K. Bose and R. Parker, J. Math. Phys. 10, 821 (1969).

32. "Pion-Nucleon Scattering in Veneziano Representation," S.K. Bose and K.C.Gupta, Phys. Rev. 184, 1572 (1969).
33. "Space-Time Symmetries and the Spontaneous Breakdown of Dilation Invariance," S.K. Bose and W.D. McGlinn, Phys. Rev. D3, 2962 (1971).
34. "Lorentz Basis for the 3 + 2 deSitter Group," S.K. Bose and R. Parker, J. Math. Phys. 12, 1009 (1971).
35. "Remarks on the Breaking of Dilation Invariance," S.K. Bose and W.D. McGlinn, Phys. Rev. D4, 342 (1971).
36. "Massive Particles and the Spontaneous Breakdown on Dilation Invariance," S.K. Bose and W.D. McGlinn, Phys. Rev. D6, 2304 (1972), D7 (1973).
37. "Geodesic Motions in the Tomimatsu-Sato Metric," S.K. Bose and M.Y. Wang, Phys. Rev. D8, 361 (1973).
38. "Elastic Scattering in the Kerr Metric," S.K. Bose and M.Y. Wang, J. Math. Phys. 15, 957 (1974).
39. "Stationary, Axially Symmetric Perturbations of Charged Kerr Black Holes," S.K. Bose and M.Y. Wang, Phys. Rev. D10, 1675 (1974).
40. "Generalization of Okubo's Formula to Four-Dimensional Unitary Groups," S.K. Bose, Phys. Rev. D11, 2272 (1975).
41. "Studies in the Kerr-Newman Metric," S K. Bose, J. Math. Phys. 16, 772 (1975).
42. "Remarks on Possible Meson Symmetries Based on Outer Product Groups," S.K. Bose, Phys. Rev. D12, 1508 (1975).
43. "Baryon Interactions in SU(4)," S.K. Bose and W.D. McGlinn, Phys. Rev. D14, 3167 (1976).
44. "Representation Mixing and the Ideal Description of Mesons," S.K. Bose, Pramana, Vol. 9, No. 5, 491 (1977).
45. "Gauge Symmetry and Its Breakdown: The Example of a BCS Superconductor," S.K. Bose, J. Math. Phys. 21, p. 2839 (1980).
46. "Electromagnetic Test Fields in the Kerr-Newman Metric," S.K. Bose, J. Math. Phys. 21, 868 (1980).
47. "Broken Symmetry and Bundle Representations," S.K. Bose, Lettere al Nuovo Cimento 28, 146 (1980).
48. "Structure of Gauge Theories With Spontaneous Symmetry Breaking," S.K. Bose, Phys. Rev. D24, 2153 (1981).

49. "A Null Tetrad Analysis of the Ernst Metric," S.K. Bose and E. Esteban, J. Math. Phys. 22, 3006 (1981).
50. "Spontaneous Symmetry Breakdown and Symmetric Spaces," S.K. Bose, Phys. Rev. D26, 515 (1982).
51. "Remarks on Maximally Embedded Self-Dual Monopoles," S.K. Bose and W.D. McGlinn, Phys. Rev. D29, 1819 (1984).
52. "Self-Dual Monopoles in SU(5)," S.K. Bose, Phys. Rev. D30, 504-507 (1984).
53. "Bound States of a Dyon and a Charged Particle," S.K. Bose, J. Phys. A18, 1289 (1985).
54. "A Note on Kaluza-Klein Theories," S.K. Bose, Phys. Rev. D31, 1493 (1985).
55. "Implementing the Bogoliubov-Valatin Transformations on a Hilbert bundle," S.K. Bose and R.N. Sen, Rep. Math. Phys. 23, 139 (1986).
56. "Dyon-Electron Bound States," S.K. Bose, J. Phys. G12, 1135 (1986).
57. "Relativistic Correction to the Aharonov-Bohm Effect," S.K. Bose, Ind. J. Phys. 61B, 273 (1987).
58. "Implementing the Bogoliubov-Valatin Transformations on a Hilbert bundle," S.K. Bose and R.N. Sen, Zbl. Math. 627, 213 (1988).
59. "Effect of Finite Mass on Gravitational Transit Time," S.K. Bose and W.D. McGlinn, Phys. Rev. D38, 2335 (1988).
60. "Spectrum of $J^P=2^+$ mesons," S.K. Bose and E.C.G. Sudarshan, Phys. Rev. Letters 62, 1445 (1989).
61. "Classical Symmetries of a Closed Bosonic 3-Brane," S.K. Bose and S.A. Bruce, Phys. Letters B225, 331 (1989).
62. "Some examples of the Algebra of Flows," S.K. Bose, J. Math. Phys. 31, 1042 (1990).
63. "The Dyon Electron System: Scattering and Electron Capture," S.K. Bose and C.C. Choo, J. Phys. A23, 2961 (1990).
64. "Algebras for the two-sphere and the three-sphere groups of compact, simple Lie groups," S.K. Bose and S.A. Bruce, J. Math. Phys. 31, 2346 (1990).
65. "Cosmological formation of Dyon Fermion bound states," S.K. Bose, J. Phys. A24, 3711 (1991).
66. "On Two-Dimensional Gravity," S.K. Bose, Mod. Phys. Letters A7, 3521 (1992).
67. "The Galilean Group in 2 + 1 Space-Times and Its Central Extension," S.K. Bose, Commun. Math. Phys. 169, 385 (1995).

68. "Representations of the 2 + 1 Dimensional Galilean Group," S.K. Bose, J. Math. Phys. 36, 875 (1995).
69. "Projective Representations of the 1+1 Dimensional Poincaré Group," S.K. Bose, J. Math. Phys.37, 2376 (1996).
70. "The structure of QCD vacuum and related topics," S.K. Bose, Zeits. für Naturforschung 52a, 133 (1997).

Books Published

1. "An Introduction to General Relativity," S.K. Bose, Wiley Eastern Limited, New Delhi Bangalore, Bombay, Calcutta, pp. 120 (1980).

Publications in Conference Proceedings, Chapter in a Book, etc.

1. "On the Structure of Multiquark Meson States," Group Theoretical Methods in Physics, ed. by W. Beiglblock, A. Bohm and E. Tagasaki (Springer-Verlag 1979). (Invited talk to the International Conference on the Application of Group Theory Methods at the University of Texas, Austin, Texas, on September 16, 1978).
2. "Reflections on the Problem of the $\pi^+\pi^0$ Mass Difference," in A Gift of Prophecy, E.C.G. Sudarshan, ed., (World Scientific 1994).
3. "The Dyon Fermion System" in Quantum Systems: New Trends and Methods ed. by A.O. Barut, I.D. Feranchuk, Ya. M. Schnir, L.M. Tomilchik (World Scientific, Singapore, 1995). (Invited talk to the QS-94 International Workshop.)

Dissertations Supervised

1. "Lorentz Basis for the 3+2 De Sitter Group," R. Parker, June 1971.
2. "Solutions of Some Selected Problems in General Relativity," M.Y. Wang, August 1974.
3. "A Study of the Ernst Metric," E. Esteban, December 1982.
4. "The Interaction of a Fermion with a Dyon," Charles C. Choo, December 1988.
5. "Study of Certain Infinite-dimensional Lie Algebras," Stanley Bruce, January 1991.