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Work Address

Delaune Distinguished Professor of Electrical Engineering
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Date of Birth

March 26, 1947

Education

- Ph.D. Indian Institute of Technology Delhi, 1970; Dissertation title: "Studies in Signal Theory."
- B.E. (Distinction), Kashmir University, 1967.

Professional Experience

Long-term appointments

- Louisiana State University, Baton Rouge, LA,
Delaune Distinguished Professor (2003 - present);
Professor (1983 - present);
Visiting Associate Professor (August 1979 - August 1980); Associate Professor (August 1979 - August 1983)

- Indian Institute of Technology, Delhi, Assistant Professor (February 1974 - August 1979); Lecturer (February 1971 - February 1974).

Short-term appointments

- Visiting Professor, Indian Institute of Advanced Study, 2004.
- National Fellow, Indian Institute of Advanced Study, Shimla, 2001-2002.
- Santa Fe Institute, Santa Fe, NM, Visitor, 1998 onwards.
- Harvard University, Cambridge, MA, Visiting Professor (January 1996 - May 1996)
- Indian Institute of Technology, Delhi, Visiting Professor (Dec. 1985 - Jan. 1986)
- Tata Institute of Fundamental Research, Bombay, December 1977.
- Bell Laboratories, Murray Hill, N.J., Guest Researcher, June 1976 - August 1976.
- Imperial College, University of London, London, U.K. Academic Visitor, November 1975 - June 1976.

Industry

- Member of the Advisory Board, Redwood Systems, Boston, 1999-2000
- Chief Scientist, Total Clarity, Inc, Boston, 2002

Professional Activities

- Reviewer of several IEEE and IEE publications as well as technical books by various University and other scholarly presses.
- Member of the Board of Governors, *Association for Intelligent Machinery*, 1998-onwards.
- Co-Founder and Co-Chairman, Series of *International Conferences on Computational Intelligence*, Sept 1995, Mar 1997, Oct 1998, North Carolina; March 2000, Atlantic City. Next Conference will be held in North Carolina in 2002.
- Member Information Technology Master Planning Task Force, LSU, 1999-2001.
- Member, Information Technology Coordination Council, College of Engineering, LSU, 2000-2001.
- Consultant, Fingerhut Corporation, Minneapolis, 1992-1994.
- UNDP Consultant, 1989-1990. Consulted with C-DAC (Centre for Development of Advanced Computing), Pune.
- Convener (Organizer), National Systems Conference, New Delhi, 1974; chairman of sessions at numerous international conferences.

Editorships

- Editorial Associate, Brain and Behavioral Science, 2002.
- Co-Guest Editor, Quantum Computing and Neural Information Processing, *Information Sciences*, 2000.
- Advisory Editor, *Circuits, Systems, and Signal Processing*, 1998-present.
- Associate Editor, *Information Sciences*, 1993-present.
- Member Editorial Board, *Journal of Combinatorics, Information, & System Science*, 1995-present.
- Guest Editor, 1993, Neural Networks and AI, *Information Sciences*.
- Co-Guest Editor, 1993, Networks for Neural Processing, *Circuits, Systems, and Signal Processing*.
- Guest Editor, *IEEE Computer*, Data Security in Computer Networks, February 1983.

Patents

- Neural networks and methods for training neural networks (with J. Pastor), U.S. Patent No. 5,426,721, June 20, 1995.
- Uniform permutation privacy system (with N.S. Jayant), US Patent No. 4,100,374, July 11, 1978.
- Instantaneous training of neural networks, Invention disclosure, July 13, 1995.
- Improved corner-classification neural networks (with Kun-Won Tang), Invention disclosure, February 5, 1997.
- Anvish, a new metasearch engine for the internet (with Bo Shu), copyright filed August, 1998. *Neural Technologies, Inc, Kansas City, has licensed the technology of the previous 4 items. This technology has been used for creation of several companies. One of these, www.solosearch.com, was purchased by another company (SearchHound) for \$15 million.*
- Interpolating neural networks and their applications (with Savitha Pinnepalli and Sai Pinnepalli), Invention disclosure, July 27, 1999. A patent application was filed in 2000.
- Polarization modulation for gigabit communication, Invention disclosure, April 2000.
- WordWarp– A system for automatic classification of text, Invention disclosure, June 2000.

Awards/Honors

- Distinguished Alumni Award of IIT Delhi, 2002.
- National Fellow, Indian Institute of Advanced Study, Shimla, 2001.
- Goyal Prize, 1998.
- IEEE-HKN(LSU) Favorite Professor of the Year, 1989.
- UNDP Tokten Fellow, 1986.
- Halliburton Award, 1982.
- Science Academy Medal of the Indian National Science Academy for contributions to science (India's highest award for a scientist less than 30 years old), 1977.
- Kothari Scientific and Research Institutes Award, 1977.
- Offered the Krantzberg Chair of Electronics by Technion, Israel Institute of Technology, 1977-1978.
- Designated Nominator, *Kyoto Prize*, the 50 million yen annual award given by the Inamori Foundation which is generally considered to be the Japanese equivalent of the Nobel Prize.
- British Council Fellow, 1975-1976.

Community

- Invited lectures around the world; newspaper and magazine articles and interviews.
- Discovery Channel, History Channel and other TV companies in the US, Europe, and India have showcased research.
- Member of the Advocate, Baton Rouge's 2000 Business Panel on Information Technology.

Publications

a) Books (Selected)

- The Conductor of the Dead. Calcutta: Writers Workshop, 1974.
- The London Bridge. Calcutta: Writers Workshop, 1977.
- The Nature of Physical Reality. New York & Bern: Peter Lang, 1986.
- Patanjali and Cognitive Science. Baton Rouge: Vitasta, 1987.
- India at Century's End. New Delhi: VOI, 1994.
- The Astronomical Code of the Rigveda. New Delhi: Aditya, 1994; Revised edition, Munshiram Manoharlal, 2000.
- In Search of the Cradle of Civilization.¹ Wheaton, IL: Quest Books, 1995. Italian, Spanish, Korean and other translations. (with G. Feuerstein and D. Frawley)
- The Secrets of Ishbar. New Delhi: Vitasta, 1996, 1998.
- Computing Science in Ancient India. Lafayette: USL Press, 1998; New Delhi: Munshiram Manoharlal, 2000.
- Ek Taal, Ek Darpan. Allahabad: Raka Prakashan, 1999.
- The Wishing Tree. New Delhi: Munshiram Manoharlal, 2001. French edition, 2004.
- The Aśvamedha. Saylorsburg: AVG, 2001. Delhi: Motilal Banarsidass, 2002.
- The Gods Within. Munshiram Manoharlal: New Delhi, 2002.
- The Architecture of Knowledge. Centre for Studies in Civilizations / Motilal Banarsidass, 2004.

a) Edited Books (Selected)

- The Architecture of Knowledge: Quantum Mechanics, Neuroscience, Computers, and Consciousness. CSC, New Delhi, 2003.
- Advances in Communications and Signal Processing (edited with W. A. Porter). New York: Springer-Verlag, 1989.
- Advances in Computing and Control (edited with W.A. Porter & J.L. Aravena). New York: Springer-Verlag, 1989.
- Advances in Communications and Control, 2 volumes (edited with W.A. Porter). Baton Rouge, LSU, 1988.
- The Proceedings of the National Systems Conference, editor, New Delhi: IIT Delhi, 1974.

¹One of the three finalists for the 1996 PMA Benjamin Franklin Award

b) Book Chapters (Selected)

- Instantaneously trained neural networks with complex inputs, In *Complex-Valued Neural Networks*, Akira Hirose (editor). World Scientific, 2003, pp. 157-180.
- Quantum neural computing, In *Advances in Imaging and Electron Physics*, vol. 94, Peter Hawkes (editor). Academic Press, 1995, pp. 259-313.
- “The three languages of the brain: quantum, reorganizational, and associative.” In *Learning as Self-Organization*, Karl Pribram and Joseph King (editors). Lawrence Erlbaum Associates, Mahwah, NJ, 1996, pp. 185-219.
- “Reflections in Clouded Mirrors: Selfhood in Animals and Machines.” In *Learning as Self-Organization*, Karl Pribram and Joseph King (editors). Lawrence Erlbaum Associates, Mahwah, NJ, 1996, pp. 511-534.
- “Shift Invariant Associative Memory,” with D. Prados in *VLSI for Artificial Intelligence*, Edited by J. Delgado-Frias and W. Moore. Boston MA: Kluwer, 1989.
- “Data security in computer networks,” in *Computers and Network Security*, Edited by M.D. Abrams and H.J. Podell. Washington: IEEE Computer Society Press, 1986.
- “Multilayered array computing,” and “The Paninian Approach to natural language processing,” in *Pattern Directed Information Analysis*, Edited by D. Dutta Majumder. New Delhi: Wiley Eastern, 1987.
- “The Indus Mandala and the Indo-Aryans,” In *New Trends In Indian Art And Archaeology*, – Dr S.R. Rao’s 70th Birthday Felicitation Volume, B.U. Nayak and N.C. Ghosh (editors). New Delhi: Aditya, 1992, pp. 105-118.
- “A new training algorithm for feedforward neural networks,” In *Advances in Fuzzy Theory and Techniques*, P.P. Wang (editor), Durham NC: Bookwright Press, 1993.
- “Of history and truth,” In *Voices on the Threshold of Tomorrow*, Georg Feuerstein and Trisha Lamb Feuerstein (editors), Wheaton, IL: Quest Books, 1993.

c) Refereed journal articles (Selected)

1. S. Kak, "General qubit errors cannot be corrected." *Information Sciences*, vol. 152, pp. 195-202, 2003.
2. S. Kak, "A class of instantaneously trained neural networks." *Information Sciences*, vol. 148, pp. 97-102, 2002.
3. K.W. Tang and S. Kak, "Fast classification networks for signal processing." *Circuits, Systems, Signal Processing*, vol. 21, pp. 207-224, 2002.
4. M. Gnanaguruparan and S. Kak, "Recursive hiding of secrets in visual cryptography," *Cryptologia*, vol. 26, pp. 68-76, 2002.
5. S. Kak, "Statistical constraints in starting a quantum computation." *Pramana, Journal of Physics*, vol. 57, pp. 683-688, 2001.
6. D. Ventura and S. Kak, "Introduction to Quantum Computing and Neural Information Processing," *Information Sciences*, vol. 128, pp. 147-148, 2000.
7. S. Kak, "Rotating a qubit," *Information Sciences*, vol. 128, pp. 149-154, 2000.
8. S. Kak, "Active agents, intelligence, and quantum computing," *Information Sciences*, vol. 128, pp. 1-17, 2000.
9. S. Kak, "Quantum key distribution using three basis states," *Pramana, Journal of Physics*, vol. 54, pp. 709-713, 2000.
10. S. Kak, "Indian binary numbers and the katapayadi notation," *Annals of BORI*, vol. 81, pp. 269-272, 2000.
11. , S. Kak, "An interesting combinatoric sutra," *Ind Journal of History of Science*, vol. 35, 2000, pp. 123-127.
12. B. Shu and S. Kak, "A neural-network based intelligent metasearch engine," *Information Sciences*, vol. 120, pp. 1-11, 1999.
13. S. Kak, "Faster web search and prediction using instantaneously trained neural networks," *IEEE Intelligent Systems*, vol. 14, pp. 79-82, November/December 1999.
14. S. Kak, "The initialization problem in quantum computing," *Foundations of Physics*, vol. 29, pp. 267-279, 1999.
15. S. Tejomurtula and S.C. Kak, "Inverse kinematics in robotics using neural networks," *Information Sciences*, vol. 116, pp. 147-164, 1999.
16. S. Kak, "Quantum computing and artificial intelligence," *IEEE Intelligent Systems*, vol. 14, pp. 9-11, July/August 1999.
17. K. W. Tang and S. Kak, "A new corner classification approach to neural network training," *Circuits, Systems, and Signal Processing*, vol. 17, pp. 459-469, 1998.
18. S. Kak, "On generalization by neural networks," *Information Sciences*, vol. 111, pp. 293-302, 1998.

19. S. Kak, "Quantum information in a distributed apparatus," *Foundations of Physics*, vol. 28, pp. 1005-1012, 1998.
20. S. Kak, "On the science of consciousness," *Indian Journal of History of Science*, vol. 32, pp. 105-120, 1997.
21. S. Kak, "Archaeoastronomy and literature," *Current Science*, vol. 73, pp. 624-627, 1997.
22. S. Kak, "Knowledge of planets in the third millennium BC," *Quarterly Journal of the Royal Astronomical Society*, vol. 37, pp. 709-715, 1996.
23. S. Kak, "Information, physics and computation," *Foundations of Physics*, vol. 26, pp. 127-137, 1996.
24. S. Kak, "Can we define levels of artificial intelligence?" *Journal of Intelligent Systems*, vol. 6, pp. 133-144, 1996.
25. S. Kak, "Speed of computation and simulation," *Foundations of Physics*, vol. 26, pp. 1375-1386, 1996.
26. S. Kak, "An I-S signboard," *Cryptologia*, vol. 20, pp. 275-279, 1996.
27. S.C. Kak, "The astronomy of the age of geometric altars," *Quarterly Journal of the Royal Astronomical Society*, vol. 36, pp. 385-396, 1995.
28. S.C. Kak, "On quantum neural computing," *Information Sciences*, vol. 83, pp. 143-160, 1995.
29. S. Kak, "On van Nooten's paper on binary numbers," *IEEE Annals of the History of Computing*, vol. 17, p. 79, 1995.
30. S. Kak, "Quantum neural computing," *Advances in Imaging and Electron Physics*, vol. 94, pp. 259-313, 1995.
31. S. Kak, "New algorithms for training feedforward neural networks," *Pattern Recognition Letters*, vol. 15, pp. 295-298, 1994.
32. S. Kak, "Astronomy of the Vedic altars," *Vistas in Astronomy*, vol. 36, pp. 117-140, 1993.
33. S. Kak, "On training feedforward neural networks," *Pramana*, vol. 40, pp. 35-42, 1993.
34. W.A. Porter and S.C. Kak, "Networks for neural processing," *Circuits, Systems, and Signal Processing*, vol. 12, pp. 153-154, 1993.
35. S. Kak, "Feedback neural networks: new characteristics and a generalization," *Circuits, Systems, and Signal Processing*, vol. 12, pp. 263-278, 1993.
36. S. Kak, "Neural networks and artificial intelligence," *Information Sciences*, vol. 70, pp. 1-3, 1993.
37. S. Bhate and S. Kak, "Panini's grammar and computer science," *Annals of the Bhandarkar Oriental Institute*, vol 72, pp. 79-94, 1993.
38. S. Kak, "State generators and complex neural memories," *Pramana*, vol. 38, pp. 271-278, 1992.

39. S. Kak, "The Vararuchi cipher," *Cryptologia*, vol. 14, pp. 79-83, 1990.
40. S. Kak, "Indus and Brahmi - further connections," *Cryptologia*, vol. 14, pp. 169-183, 1990.
41. S.C. Kak, "Self-indexing of neural memories," *Physics Letters A*, vol. 143, pp. 293-296, 1990.
42. S.C. Kak, "Systolic computing," *Jijnasa*, vol. 5, pp. 37-41, 1990.
43. S.C. Kak, "The sign for zero," *Mankind Quarterly*, vol. 30, pp. 199-204, 1990.
44. S.C. Kak, "A new method for coin flipping by telephone," *Cryptologia*, vol. 13, pp. 73-78, 1989.
45. S.C. Kak, "New developments in cryptology," *Jijnasa*, vol. 2, pp. 11-17, 1989.
46. C.H. Youn and S.C. Kak, "Continuous unlearning in neural networks," *Electronics Letters*, vol. 25, pp. 202-203, 1989.
47. S.C. Kak and M.C. Stinson, "A bicameral neural network where information can be indexed," *Electronics Letters*, vol. 25, pp. 203-205, 1989.
48. D.L. Prados and S.C. Kak, "Neural network capacity using the delta rule," *Electronics Letters*, vol. 25, pp. 197-199, 1989.
49. S.D. Kak, "The Brahmagupta algorithm for square rooting," *Ganita Bharati*, vol. 11, pp. 27-29, 1989.
50. M.C. Stinson and S.C. Kak, "Bicameral neural computing," *Lecture Notes in Computing and Control*, vol. 130, pp. 85-96, 1989.
51. D. Prados and S.C. Kak, "Non-binary neural networks," *Lecture Notes in Computing and Control*, vol. 130, pp. 97-104, 1989.
52. C.H. Youn and S.C. Kak, "New learning and control algorithms for neural networks," *Lecture Notes in Computing and Control*, vol. 130, pp. 105-116, 1989.
53. S.C. Kak, "A two-layered mesh array for matrix multiplication," *Parallel Computing*, vol. 6, pp. 383-385, 1988.
54. S.C. Kak, "The Aryabhata cipher," *Cryptologia*, vol. 12, pp. 113-117, 1988.
55. S.C. Kak, "The use of determinatives in NLP," *AI Magazine*, vol. 9, pp. 10-12, Summer 1988.
56. S.C. Kak, "A frequency analysis of the Indus script," *Cryptologia*, vol. 12, pp. 129-143, 1988.
57. S.C. Kak, "Multilayered array computing," *Information Sciences*, vol. 45, pp. 347-365, 1988.
58. M.C. Stinson and S.C. Kak, "A bicameral neural network that improves convergence," *Neural Networks*, vol. 1, p. 136, 1988.
59. S.C. Kak, "The Paninian approach to natural language processing," *International Journal of Approximate Reasoning*, vol. 1, pp. 117-130, 1987.
60. S.C. Kak, "Generating d-sequences," *Electronics Letters*, vol. 23, pp. 202-203, 1987.

61. S.C. Kak, "A new result on d-sequences," *Electronics Letters*, vol. 23, p. 617, 1987.
62. S.C. Kak, "The Aryabhata algorithms for polynomials," *Electronics Letters*, vol. 23, pp. 838-839, 1987.
63. S.C. Kak, "Computational aspects of the Aryabhata algorithm," *Indian Journal of History of Science*, vol. 21, pp. 62-71, 1986.
64. S.C. Kak, "On secret hardware, public-key cryptography," *Computers and Digital Technique (Proc. IEE - Part E)*, vol. 133, pp. 94-96, 1986.
65. S.C. Kak, "Encryption and error-correction using d-sequences," *IEEE Trans. on Computers*, vol. C-34, pp. 803-809, 1985.
66. S.C. Kak, "How to detect tampering of data," *Information Processing Letters*, vol. 20, pp. 109-110, 1985.
67. S.C. Kak, "Linking the world together," *Science Today*, vol. 19, pp. 52-59, April 1985.
68. S.C. Kak, "Routing the packet," *Science Today*, vol. 19, pp. 44-46, May 1985.
69. S.C. Kak, "Threshold detection error bounds," *Journal of the Inst. of Electronic and Telecomm. Engineers*, vol. 30, pp. 29-35, 1984.
70. S.C. Kak, "On information associated with an object," *Proceedings Indian National Science Academy*, vol. 50, pp. 386-396, 1984.
71. S.C. Kak, "On the method of puzzles for key distribution," *Int. Journal of Comp. and Inf. Sciences*, vol. 13, 1984, pp. 103-109.
72. S.C. Kak, Review of 'Computer Networks and Distributed Processing: Software, Techniques, and Architecture', by James Martin, *IEEE Computer*, vol. 16, March 1983.
73. S.C. Kak, "Data security in computer networks - Guest Editor's Introduction," *Computer*, vol. 16, pp. 8-10, February 1983.
74. S.C. Kak, "Strings of first digits of powers of a number," *Indian Journal of Pure and Applied Mathematics*, vol. 14, pp. 896-907, July 1983.
75. S.C. Kak, "An overview of analog encryption," *Proceedings IEE*, vol. 130, Pt. F, pp. 399-404, August 1983.
76. S.C. Kak, "A structural redundancy in d-sequences," *IEEE Transactions on Computers*, vol. C-32, pp. 1069-1070, November 1983.
77. S.C. Kak, "Exponentiation modulo a polynomial for data security," *Int. Journal of Computer and Inf. Science*, vol. 12, pp. 337-346, 1983.
78. S.C. Kak, Review of 'Aspects of Distributed Computer Systems,' by H. Lorin, *IEEE Computer*, vol. 15, October 1982, Also in *Proc. IEEE*, 1983.
79. A.K. Raina and S.C. Kak, "Data security: a cryptographic approach," *Proceedings Indian Academy of Sciences (Engineering Sciences)*, vol. 5, Part 1, pp. 65-83, March 1982.

80. S.C. Kak and A. Chatterjee, "On decimal sequences," *IEEE Transactions on Information Theory*, vol. IT-27, pp. 647-652, September 1981.
81. S.C. Kak, "Masking ciphers," *Proceedings IEE*, vol. 127, pp. 185-189, June 1980.
82. S.C. Kak, "On efficiency of chemical homeostasis," *IEEE Trans. on Systems, Man & Cybernetics*, vol. SMC-9, pp. 160-163, March 1979.
83. S.C. Kak, "Encryption of signals using data transpositions," *Proceedings of the IEE*, vol. 125, pp. 1327-1328, 1978.
84. S.C. Kak, "On quantum numbers and uncertainty II," *Nuovo Cimento*, vol. 41B, pp. 1-6, 1977.
85. S.C. Kak, "Sampling and redundancy," *Journal Inst. of Elect. and Telecom. Engrs.*, vol. 23, pp. 336-340, 1977.
86. S.C. Kak and N.S. Jayant, "Speech encryption using waveform scrambling," *Bell System Technical Journal*, vol. 56, pp. 781-808, May-June 1977.
87. S.C. Kak, "The discrete finite Hilbert transform," *Indian Journal Pure and Applied Maths.*, vol. 8, pp. 1385-1390, November 1977.
88. S.C. Kak, "On quantum numbers and uncertainty," *Nuovo Cimento*, vol. 33B, pp. 530-534, 1976.
89. H.F. Harmuth, and S.C. Kak, et al., "Walsh functions versus sinusoids," *IEEE Trans. on EMC*, vol. EMC-17, pp. 194-195, August 1975.
90. S.C. Kak, "Binary sequences and redundancy," *IEEE Trans. on Systems, Man and Cybernetics*, vol. SMC-4, pp. 399-401, July 1974.
91. S.C. Kak, "Reliability with an evolutionary failure rate," *IEEE Trans. on Reliability*, vol. R-22, pp. 239-240, October 1973.
92. S.C. Kak, "Hilbert transformation for discrete data," *Int. Journal of Electronics*, vol. 34, pp. 177-183, February 1973.
93. S.C. Kak, "Causality and limits on frequency functions," *Int. Journal of Electronics*, vol. 30, pp. 41-47, January 1971.
94. S.C. Kak, "Probability distribution to characterize clipped waves," *Proc. IEEE*, vol. 59, pp. 1534-1535, October 1971.
95. S.C. Kak, "On bicirculant matrices," *Intl. Conf. on Combinational Maths.*, New Delhi, December 1972. Also in *Proc. Indian National Science Academy, ser A.*, vol. 41, no. 3, 1975.
96. S.C. Kak, "A two-valued evolutionary process," *Proc. IEEE*, vol. 69, pp. 1005-1006, 1972.
97. S.C. Kak, "The discrete Hilbert transform," *Proc. IEEE*, vol. 58, pp. 585-586, April 1970.
98. S.C. Kak, "Sampling theorem in Walsh-Fourier analysis," *Electronics Letters*, vol. 6, pp. 447-448, July 1970.

99. S.C. Kak, "Spectrum estimation with regularly missed observations," *Electronics Letters*, vol. 6, pp. 671-672, October 1970.
100. S.C. Kak, "Baseband pulse shaping," *Electronics Letters*, vol. 6, October 1970.
101. S.C. Kak, "Classification of random binary sequences using Walsh-Fourier analysis," *IEEE Trans. on EMC*, vol. EMC-13, pp. 74-77, August 1970.
102. S.C. Kak, "Information transmission with continuous signals," *Proc. IEEE*, vol. 57, pp. 111-112, January 1969.
103. S.C. Kak, "Function approximation and Legendre polynomials," *Journal Inst. Telecom. Engrs.*, vol. 15, pp. 827-830, December 1969.
104. S.C. Kak, "Zero-crossing information for signal reconstruction," *Electronics Letters*, vol. 5, December 1969, pp. 645-646.
105. S.C. Kak, "Fourier, Laplace and Hilbert transforms," *Electronics Letters*, vol. 4, pp. 396-397, September 1968.
106. S.C. Kak, "New criterion of realizability," *Electronics Letters*, vol. 4, pp. 537-538, November 1968.

Selected Conference Proceedings

1. S. Kak, "Instantaneously trained neural networks," Fifth International Conference on Computational Intelligence and Neuroscience, NC, March 2002.
2. S. Kak, "Rotating a qubit," Proceedings of the Fourth International Conference on Computational Intelligence and Neuroscience, NC, February 2000.
3. S.C. Kak, "Quantum computing and artificial intelligence," Plenary Lecture, Proceedings of the Fourth International Conference on Computational Intelligence and Neuroscience, NC, February 2000.
4. G. de Souza and S.C. Kak, "Dynamic radius allocation in corner classification neural networks," Proceedings of the Third International Conference on Computational Intelligence and Neuroscience, NC, October 1998.
5. S.C. Kak, "On masks of mind," International Seminar on Mind, Man and Mask, New Delhi, Feb 24-28, 1998.
6. K.-W. Tang and S.C. Kak, "Corner classification neural networks where the output weights are learnt," Second International Conference on Computational Intelligence and Neuroscience, NC, March 1997.
7. S.C. Kak, "Does quantum mechanics have relevance in neuroscience?" Second International Conference on Computational Intelligence and Neuroscience, NC, March 1997.
8. S.C. Kak, "Why machines cannot be conscious," Towards a Science of Consciousness (Tucson II), April 1996.
9. S.C. Kak, "Neural nets, information, and intelligence," (Invited Paper) Second World Congress of Nonlinear Analysis, Athens, Greece, July 1996.
10. S.C. Kak, "The three languages of the brain," (Invited Paper) Fourth Appalachian Conference on Behavioral Neurodynamics, Radford, September 22-25, 1995.
11. S.C. Kak, "On generalization by neural networks," First International Conference on Computational Intelligence and Neuroscience, NC, October 1995.
12. S.C. Kak, "New directions in neural network research", Joint Conference on Information Sciences, NC, November 1994.
13. P. Raina, J. Christiansen, T. Clacko, S.C. Kak, "Financial data modeling using feedforward neural networks", Joint Conference on Information Sciences, NC, November 1994.
14. S.C. Kak, "Reflections in clouded mirrors: selfhood in animals and machines", Symposium on Aliens, Apes, and Artificial Intelligence, Univ of Alabama, February 13, 1993.
15. S.C. Kak, "An information view of the EPR experiment", Symposium on the Foundations of Modern Physics, Cologne, Germany, June 1-5, 1993.
16. S. Das and S.C. Kak, "The polynomial neural network", Second International Conference on Fuzzy Theory and Technology, Durham, NC, October 1993.

17. D. Young and S.C. Kak, "Feature based retrieval in neural networks", Proceedings IEEE Southeastcon, 1992.
18. S.C. Kak, "Learning and generalization in feedforward neural networks", First International Conference on Fuzzy Theory and Technology, Durham, NC, October 1992.
19. S.C. Kak and S. Das, "Storing pattern pairs in a bicameral neural network," Proceedings IEEE Southeastern Conference, New Orleans, April 1990.
20. S.C. Kak, "Symmetry breaking in neural memories," Proceedings International Symposium on Circuits and Systems, New Orleans, April 1990.
21. S.C. Kak, "Symmetry breaking in neural memories," Symposium on the Foundations of Modern Physics, Joensuu, Finland, August 1990.
22. S.C. Kak, "Neural computing with structured information," 2nd International Conference on Tools for Artificial Intelligence, Washington, D.C., November 1990.
23. S.C. Kak and A.O. Barbir, "The Brahmagupta algorithm for square rooting," Proceedings of the 21st Southeastern Symposium on System Theory, Tallahassee, March 1989.
24. M.C. Stinson, S.C. Kak, and D.G. Foster, "The bicameral neural network model: an application of conditional rule structure to speech perception," Proceedings of the Workshop on Natural Language Processing for Artificial Intelligence, Roorkee, Jan. 14-15, 1989.
25. S.C. Kak, "On Stochastic Computing," Proceedings of the 22nd Annual Conference on Information Sciences and Systems, Princeton, N.J., pp. 131-133, March 1988.
26. M.C. Stinson and S.C. Kak, "Techniques to improve convergence of neural networks," Proceedings of the 22nd Annual Conference on Information Sciences and Systems, Princeton, N.J., p. 275, March 1988.
27. M.C. Stinson and S.C. Kak, "Asynchronous controller to improve the convergence of neural nets," Proceedings of the 26th Annual ACM Conference of the Southeast Region, pp. 410-413, April 21-22, 1988.
28. D. Prados and S.C. Kak, "Shift invariant associative memory using VLSI," Proceedings of the International Workshop on VLSI for Artificial Intelligence , Oxford, U.K., 1988.
29. S.C. Kak, "Stochastic computing," IEEE International Symposium on Information Theory, Osaka, Japan, 1988.
30. M.C. Stinson and S.C. Kak, "On bicameral neural networks," 1st International Neural Networks Society (INNS) Conference, Boston, September 1988.
31. M.C. Stinson and S.C. Kak, "Bicameral Neural Computing," Proceedings ComCon 1988, (2nd International Conference on Advances in Communications and Controls), Baton Rouge, LA, Oct. 1988.
32. C.H. Youn and S.C. Kak, "New learning and control algorithms for neural networks," Proceedings ComCon 1988 (2nd International Conference on Advances in Communications and Controls), Baton Rouge, Oct. 1988.

33. D.L. Prados and S.C. Kak, "Nonbinary neural networks," Proceedings ComCon 1988 (2nd International Conference on Advances in Communications and Controls), Baton Rouge, Oct. 1988.
34. S.C. Kak, "The Paninian approach to natural language processing," Proceedings of the Second International Conference on Advances in Pattern Recognition and Digital Technique, Calcutta, Jan., 6-9, 1986.
35. D.P. Norton and S.C. Kak, "On Shuffling of 2-D Data," Proceedings of the 20th Annual Conference on Information Science and Systems, Princeton, N.J., pp. 552-556, March 19-21, 1986.
36. S.C. Kak, "Multilayered array computing," Proceedings of the 20th Annual Conference on Information Sciences and Systems, Princeton, N.J., pp. 436-441, March 19-21, 1986.
37. S.C. Kak, D.P. Norton and A. El-Amawy, "An efficient implementation of the Aryabhata algorithm," Proceedings of the 20th Annual Conference on Information Sciences and Systems, Princeton, N.J., pp. 790-792, 1986.
38. S.C. Kak, "Digital signatures in networks," Proceeding of the IEEE International Conference on Systems, Man and Cybernetics, India, pp. 968-971, December 1983-January 1984.
39. S.C. Kak, "Joint encryption and error-correction coding," IEEE symposium on Security and Privacy, Oakland, CA, pp. 55-60, April 1983.
40. S.C. Kak, "Information and complexity with applications to digital fault testing," Proceedings of the IEEE Southeastcon, pp. 62-65, April 1982.
41. S.C. Kak, "Information in a quantum description: an exploratory investigation," IEEE International Symposium on Information Theory, France, 1982.
42. S.C. Kak and A.K. Sood, "On a class of interconnection networks," Proceedings IEEE Southeastcon, pp. 232-236, 1981.
43. S.C. Kak, "Decimal sequences and their applications in communications," Proceedings International Conference in Communications, Denver, June 1981.
44. S.C. Kak, "Error bounds for a spread spectrum multiple access system," Proceedings of the National Telecommunications Conference, New Orleans, pp. G 3.4.1-G 3.4.4, 1981.
45. S.C. Kak, "Further results on maximum length decimal sequences," IEEE Intl. Symposium on Information Theory, Santa Monica, February 1981.
46. S.C. Kak, "Scrambling and randomization," IEEE Workshop on Communications Security (Crypto 81), University of California, Santa Barbara, pp. 59-63, August 1981.
47. S.C. Kak and A Chatterjee, "Theory and application of maximum length decimal sequences," Proceedings 14th Annual Conference on Information Sciences and Systems, Princeton, N.J., pp. 618-623, March 1980.
48. S.C. Kak & B. Sathiapalan, "An algorithmic information approach to cryptography," Proceedings 14th Annual Conference on Information Sciences and Systems, Princeton, N.J., March 1980.

49. S.C. Kak, "Real-time encryption of signals - a review," Proceedings 22nd Midwest Symposium on Circuits and Systems, Philadelphia, U.S., June 1979.
50. S.C. Kak, "Product formulas for Walsh functions," Proceedings Walsh Symposium at Washington, D.C., April 1973.
51. S.C. Kak, "On the Discrete Hilbert Transformation," Proceedings 5th Hawaii Conf. on System Science, January 1972.
52. S.C. Kak, "On matrices with Walsh vectors as the eigenvectors," Proc. Walsh Symp. at Washington, D.C., April 1972.
53. S.C. Kak, "On classification of binary sequences," Proceedings Walsh Symposium at Washington, D.C., April 1972.

Invited lectures (selected)

- Rochester Institute of Technology (Spring 2004)
- Washburn University (Spring 2004)
- Univ of Hawaii (Fall 2003)
- Duke University, NCSU (Fall 2003)
- Univ of the Philippines, Manila (Spring 2002)
- Univ of Minnesota (Fall 2002)
- National Heritage Museum, Lexington, Mass. (Summer 2002)
- UCLA, Los Angeles (Spring 2002)
- University of Houston, Houston (Spring 2002)
- Duke University, Durham (Spring 2001)
- USF Medical School, Tampa (Fall 2000)
- University of Missouri, Kansas City (Fall 2000)
- University of Utah, Salt Lake City (Fall 2000)
- University of California, Irvine (Spring 2000).
- Stanford University (Spring 2000)
- University of California, Berkeley (Spring 2000).
- Georgia Tech (Fall 1999)
- Univ of Illinois at Urbana (Fall 1999)
- Univ of Wisconsin (Fall 1999)
- Concordia Univ, Montreal (Fall 1999)
- “The Hoopla about quantum computers,” Indian Institute of Technology, Delhi, March 27, 1997.
- “Quantum computation: Will it revolutionize science?” Southern University, Baton Rouge, April 24, 1997.
- “The origins of science,” Festival of India at Atlanta, August 17, 1997.
- “Early computing and cognitive sciences and their representation,” Massachusetts Institute of Technology, Boston, September 27, 1997.
- “Birth of Indian science,” Georgia Tech, Atlanta, January 18, 1998.
- “The frontiers of modern science,” Univ of Miami, Miami, January 18, 1999.

- “Quantum neural computing,” Physics Department, LSU, March 11, 1995.
- “The birth of science,” IIT Delhi, August, 1995.
- “The views of Janus: looking behind and looking ahead at science,” Philosophy Foundation, Boston, April 20, 1996.
- “Mathematics and astronomy in the Indus-Sarasvati age,” International Conference on Re-visiting the Indus-Sarasvati Age, Atlanta, October 5, 1996.
- “On the origins of science in India,” Indira Gandhi National Centre for the Arts, Delhi, March 26, 1997.
- “Science in the next decade,” India International Center, New Delhi, September 18, 1986.
- “Bicameral neural computing,” Tulane University, New Orleans, April 6, 1989.
- “Neural computing with structured information,” Cambridge University, Cambridge, U.K., December 20, 1989.
- “Self-indexing in neural computations,” University of New Orleans, New Orleans, March 1991.
- “Science in ancient India,” University of Michigan, Ann Arbor, February 7, 1992.
- “Ancient Science,” George Washington University, Washington, D.C., April 12, 1992.
- “Challenges facing the modern university,” Luncheon Speech at the inauguration celebrations for Dr Lyons, the incoming president of Jackson State University, Jackson, Mississippi, March 18, 1993.
- “Neural networks, learning, and artificial intelligence,” Duke Electrical Engineering Colloquium, Duke University, November 16, 1994.
- “Signal design using Walsh functions,” International Symposium on Walsh functions, Warangal, India (1972).
- “Aspects of relativity theory,” AIIMS, New Delhi (1979).
- “Decimal sequences,” Bell Laboratories, 1980.
- “Data Security,” Special Library Association Conference, New Orleans, 1983.
- “Computer security,” Special Library Association Conference, New Orleans, 1983.
- “Coding and cryptography using D sequences,” IBM TJ Watson Center, 1983.
- “The roots of science in India,” India International Center, New Delhi, January 3, 1986.

Also seminars at ULL, NC State, IIT Delhi, IIT Bombay, Wayne State University, TIFR, Indian Telephone Industries (Bangalore), Regional Engineering College, Srinagar, Telecommunications Research Centre (New Delhi), Poona University, Southern University, Loyola University, SMU etc.

Papers on Indian Studies

1. Space and cosmology in the Hindu temple. Vaastu Kaushal, International Symposium on Science and Technology in Ancient Indian Monuments. New Delhi, India, Nov 16-17, 2002.
2. The Indian epic song tradition. The 7th International Conference and Festival of Asian Music. Busan, Korea, Sept 26-30, 2002.
3. Early Indian music. APSE Symposium in "A Search in Asia for a New Theory of Music." Quezon City, Philippines, Feb 17-23, 2002.
4. India: A Bridge to the Future. World Affairs, Vol. 6, January-March 2002, pages 96-105.
5. The gods within: on the Vedic understanding of mind and neuroscience, The Adyar Library Bulletin, vol. 64, 2000, pp. 7-55.
6. The idea of 22 śrutis. Sandhān, vol 1, 2001, pp 69-79.
7. Yamatarajabhanasālagam, an interesting combinatoric sutra. Indian Journal of History of Science, vol. 35, 2000, pp. 123-127.
8. Indian binary numbers and the Kaṭapayādi notation. Annals of the BORI, vol 81, 2000.
9. The solar equation in Angkor Wat. Indian Journal of History of Science, vol. 34, 1999, pp. 117-126.
10. A chronological framework for Indian culture. Journal of the Indian Council of Philosophical Research. 2001.
11. A Brahmanic fire altar explains a solar equation in Angkor Wat. Journal of the Royal Astronomical Society of Canada. vol. 93, 1999, pp. 216-220. (with Graham Millar)
12. *Computing Science in Ancient India*, T.R.N. Rao and S. Kak (eds.). Lafayette: USL Press, 1998. Indian edition, Munshiram Manoharlal, Delhi, 1999.
13. The speed of light and Purāṇic cosmology. LANL physics archive 9804020, 1998. Also in the Annals of the Bhandarkar Oriental Research Institute, vol. 80, 1999, pp. 113-123.
14. Mind, immortality, and art. Chapter in *Mind, Man and Mask*, edited by S.C. Malik, 2001.
15. Indic ideas in the Graeco-Roman world. Indian Historical Review, 1999. Also in *IndiaStar Literary Magazind*, 1998. <http://www.indiastar.com>
16. Vaiṣṇava metaphysics or a science of consciousness. Prāchya Pratibhā, vol. 19, 1997-8, pp. 113-141.
17. Astronomy and its role in Vedic culture. Chapter 23 in *Science and Civilization in India, Vol. 1, The Dawn of Indian Civilization, Part 1*, edited by G.C. Pande, Oxford University Press, Delhi, 1998, pp. 507-524.
18. Physical concepts in Sāṃkhya and Vaiśeṣika. Chapter in *Science and Civilization in India, Vol. 1, Part 2*, edited by G.C. Pande, Oxford University Press, Delhi, 2000.

19. The development of astronomy from Vedāᅅga Jyotiᅅa to Āryabhata. Chapter in *Science and Civilization in India, Vol. 1, Part 2*, edited by G.C. Pande, Oxford University Press, Delhi, 2000.
20. Science in ancient India. In S. Sridhar and N. Mattoo (eds.), *Ananya: A Portrait of India*, AIA: New York, 1997, pp. 399-420.
21. From Vedic science to Vedānta. *Hindu-Christian Studies Bulletin*, vol 10, 1997, pp. 21-27.
22. Archaeoastronomy and literature. *Current Science*, vol. 73, No. 7, 10 October 1997, pp. 624-627.
23. Consciousness and freedom according to the ŚivaSūtra. *Prāchya Pratibhā*, vol. 19, 1997-8, pp. 233-248.
24. Vena athavā Śukra. *Veda Savitā*, vol. 18, 1998, p. 76.
25. Sāyaᅅa's astronomy. *Indian Journal of History of Science*, vol. 33, 1998, pp. 31-36.
26. Early theories on the distance to the sun. *Indian Journal of History of Science*, vol. 33, 1998, pp. 93-100.
27. The orbit of the sun in the Brāhmaᅅas. *IJHS*, vol. 33, 1998, pp. 175-191.
28. On the science of consciousness in ancient India. *Indian Journal of History of Science*, vol. 32, 1997, pp. 105-120.
29. The rhythms of consciousness. *Quest*, vol. 10, 1997, pp. 52-56.
30. Three old Indian values of π . *IJHS*. vol 32, 1997, 307-314.
31. Vena, Veda, Venus. *Adyar Library Bulletin*, vol. 60, pp. 229-239. Also in *IJHS*, vol 33, 1998, pp. 25-30.
32. Book review of "Classifying the Universe" by Brian K. Smith, *Contributions to Indian Sociology* (n.s.), vol. 30, 1996, pp. 333-334.
33. Knowledge of planets in the third millennium BC. *Quarterly Journal of the Royal Astronomical Society*, vol. 37, 1996, pp. 709-715.
34. An Indus-Sarasvatī signboard. *Cryptologia*, vol. 20, 1996, pp. 275-279.
35. Mexican dilemmas. *World Affairs*, vol. 5(1), June 1996, pp. 53-56.
36. Book review of "Indian Mathematics and Astronomy: Some Landmarks" by S. Balachandra Rao, *Journal for the History of Astronomy*, 1996.
37. A note on caste. *Annals of the Bhandarkar Oriental Research Institute*, vol. 77, 1996, pp. 235-240.
38. On the science of consciousness in ancient India. *Indian Journal of History of Science*, vol. 32, 1997, pp. 105-120.

39. *In Search of the Cradle of Civilization: New Light on Ancient India*, Wheaton, Illinois: Quest Books, 1995; Delhi: Motilal Banarsidass, 1999. [with G. Feuerstein, D. Frawley] (To order in the U.S. call Quest Books at 1-800-669-9425)²
40. The astronomy of the age of geometric altars. *Quarterly Journal of the Royal Astronomical Society*, vol. 36, 1995, pp. 385-396.
41. Indic language families and Indo-European. *Yavanika*. No. 6, 1996, pp. 51-64.
42. The three languages of the brain: quantum, reorganizational, and associative. 4th Appalachian Conference on Behavioral Neurodynamics. Radford, Sept 1995; as a book chapter in *Learning as Self-Organization*, edited by Karl Pribram and Joseph King, Lawrence Erlbaum Associates, 1996, pp. 185-219.
43. Technology, commerce and international relations. *World Affairs*, vol. 4(1), June 1995, pp. 85-88.
44. From Vedic science to Vedānta. Paper presented at the 5th International Congress of Vedānta, August 12, 1994, Miami University, Oxford, Ohio. An abridged version appeared in *Śrījñānāmṛtam, A Memorial Volume in Honour of Prof Shri Niwas Shastri*, Vijaya Rani (editor), Parimal Publications, Delhi, 1996, pp. 553-568. Full paper in *Brahmavidyā: The Adyar Library Bulletin*, vol. 59, 1995, pp. 1-36.
45. On language families and the Indo-Aryan problem. Paper in the theme "Language, Anthropology and Archaeology" presented at the *World Archaeological Congress -3*, New Delhi, December 1994.
46. The evolution of writing in India. *Indian Journal of History of Science*, vol. 28, 1994, pp. 375-388.
47. The Astronomical Code of the Rigveda, *Current Science*, vol. 66, 1994, pp. 323-326.
48. The Astronomical Code of the Rigveda, *Puratattva: Bulletin of the Indian Archaeological Society*, Number 25, 1994/5, 1-20.
49. On the classification of Indic languages, *Annals of the Bhandarkar Oriental Research Institute*, vol. 75, 1994, pp. 185-195.
50. *The Astronomical Code of the Rgveda*. New Delhi: Aditya, 1994. Revised edition (212 pages) Delhi: Munshiram Manoharlal, 2000. (To order in the U.S. email South Asia Books at sabooks@juno.com.
51. Astronomy of the Vedic altars, *Vistas in Astronomy*, vol. 36, 1993, pp. 117-140.
52. The structure of the R̥gveda, *Indian Journal of History of Science*, vol. 28, 1993, pp. 71-79.
53. Planetary periods from the Rigvedic code, *Mankind Quarterly*, vol. 33, 1993, pp. 433-442.
54. Of History and Truth, In *Voices on the Threshold of Tomorrow*, Edited by Georg Feuerstein and Trisha Lamb Feuerstein, Quest Books, 1993.

²One of three books nominated for the 1996 PMA Benjamin Franklin Award at the ABA Convention in Chicago in 1996

55. Book Review: “The Interpretation of Caste” by Declan Quigley, *The Times of India* , December 12, 1993.
56. Understanding caste in India, *Mankind Quarterly*, vol. 34, 1993, pp. 117-123.
57. Further observations on the Rigvedic code, *Mankind Quarterly*, vol. 33, 1992, pp. 163-170. [with David Frawley]
58. The etymology of Vahiguru, *Journal of the Oriental Institute*, vol. 42, 1992, page 63.
59. Pāṇini’s grammar and computer science, *ABORI*, vol. 72, 1993, pp. 79-94. [With Saroja Bhate]
60. The Poplar and the Chinar: Kashmir in a historical outline, *Journal of Commonwealth and Postcolonial Studies*, vol. 1, No. 1, 1993, pp. 73-91. Also in *International Journal of Indian Studies*, vol. 3, No. 2, 1993, pp. 33-61.
61. Reflections in clouded mirrors: selfhood in animals and machines. In *Symposium on Aliens, Apes, and Artificial Intelligence*, Huntsville, AL, February 1993; published as a chapter in *Learning as Self-Organization*, edited by Karl H. Pribram and Joseph King, Lawrence Erlbaum Associates, Mahwah, 1996, pp. 511-534.
62. Astronomy in Śatapatha Brāhmaṇa, *Indian Journal of History of Science*, vol 28, 1993, pp. 15-34.
63. The Indus tradition and the Indo-Aryans, *Mankind Quarterly*, vol. 32, 1992, pp. 195-213.
64. The Indus Mandala and the Indo-Aryans, In *New Trends in Indian Art and Archaeology —Dr S.R. Rao’s 70th Birthday Felicitation Volume*, B.U. Nayak and N.C. Ghosh (Editors), Aditya Prakashan, Delhi, 1992, pp. 141-154.
65. A new view of ancient India, *Yoga Journal*, Number 105, 1992, pp. 64-102. [with Georg Feuerstein and David Frawley]
66. Astronomy in the Vedic altars and the Ṛgveda, *Mankind Quarterly*, vol. 33, 1992, pp. 43-55.
67. The politics of quotas in South Asia, *Journal of Social, Political, and Economic Studies*, vol. 16, 1991, pp. 401-421.
68. The controversy of the honey bee dance language, *Mankind Quarterly*, vol. 31, 1991, pp. 357-365.
69. Japan kī haiku kavita, *Kadambini*, vol. 30, no. 2, 1990.
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71. Book Review of *Archaeology and Language: The Puzzle of Indo-European Origins* by Colin Renfrew, *Indian Journal of History of Science*, vol. 25, 1990, pp. 201-202.
72. Indus and Brahmi: further connections, *Cryptologia*, vol. 14, 1990, pp. 169-183.
73. The sign for zero, *Mankind Quarterly*, vol. 30, 1990, pp. 199-204.

74. Religion and politics in East Punjab, *Journal of Social, Political, and Economic Studies*, vol. 15, 1990, pp. 435-456.
75. Indus script and Brahmi, *Hinduism Today*, vol. 12, November 1990.
76. Kalidasa and the Agnimitra problem, *Journal of the Oriental Institute*, vol. 40, 1990, pp. 51-54.
77. Some early codes and ciphers, *Indian Journal of History of Science*, vol. 24, 1989, pp. 1-7.
78. The Brahmagupta algorithm for square rooting, *Ganita Bharati*, vol. 11, 1989, pp. 27-29.
79. Indus writing, *Mankind Quarterly*, vol. 30, 1989, pp. 113-118.
80. The Aryabhata cipher, *Cryptologia*, vol. 12, 1988, pp. 113-117.
81. A frequency analysis of the Indus script, *Cryptologia*, vol. 12, 1988, pp. 129-143.
82. The lotus and the rainbow, *India Intl. Centre Quarterly*, vol. 15, No. 3, 1988, pp. 9-20.
83. The use of determinatives in NLP, *AI Magazine*, vol. 9, pp. 10-12, Summer 1988.
84. The Paninian approach to natural language processing, *Int. Journal of Approximate Reasoning*, vol. 1, 1987, pp. 117-130.
85. The study of the Indus script, *Cryptologia*, vol. 11, 1987, pp. 182-191.
86. On the decipherment of the Indus script, *Indian Journal of History of Science*, vol. 22, 1987, pp. 41-62.
87. On astronomy in ancient India, *Indian Journal of History of Science*, vol. 22, 1987, pp. 205-221.
88. On chronology of ancient India, *Indian Journal of History of Science*, vol. 22, 1987, pp. 222-234.
89. The Aryabhata algorithm for polynomials, *Electronics Letters*, vol. 23, 1987, pp. 383-385.
90. *Patañjali and Cognitive Science*, Baton Rouge: Vitasta, 1987.
91. Computational aspects of the Aryabhata algorithm, *Indian Journal of History of Science*, vol. 21, 1986, pp. 62-71.
92. The roots of science in India, *India International Centre Quarterly*, vol. 13, 1986, pp. 181-196.
93. *The Nature Of Physical Reality*. New York: Peter Lang, 1986.
94. Series of articles in the Times of India, *Hindustan Times*, rediff.com, sulekha.com, and other Indian papers.