

PROF. RAVI V. GOMATAM

Curriculum Vitae

Director, Institute of Semantic Information Sciences & Technology, Berkeley ● Mumbai
Adjunct Professor, Birla Institute of Technology and Science, Pilani, India

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WIKIPEDIA ENTRY

http://en.wikipedia.org/wiki/Gomatam_Ravi

EDUCATION

- (1998) Ph.D. in Foundations of Quantum Mechanics, Mumbai University, India
- (1974) M.E. in Electronics Engineering, BITS, Pilani, India
- (1972) B.E. in Electrical and Electronics Engineering, Annamalai University, India

FIELDS OF RESEARCH INTEREST

Macroscopic Quantum Mechanics; Semantic Information; Semantic web; Semantic Computing; Macroscopic Quantum Computing; Foundations of Chemistry; Complex Analysis; Exotic Manifolds; Complexity and Information; Entropy and Information; Quantum Signal Processing; Biology and Information.

CAREER SUMMARY

Professor Ravi Gomatam is an NRI research scientist, who has lived over three decades in the USA, working in both industry and later in full-time research & academic positions. After obtaining his Masters degree in electronics engineering from India, he moved to the USA in the early 1970s, ran his own consultancy firm in the areas of operating system design, data communications and very-large

database design, and carried out projects for many fortune-500 companies including General Motors, Ford, Chrysler, Burroughs and IBM. In the mid 1980s, he turned to academics, obtaining his Ph.D. in the foundations of quantum mechanics, which remains his area of active research. He now does full-time research and graduate level teaching. He is an adjunct professor at Birla Institute of Technology & Science, Pilani, Rajasthan, and is the director of the Institute of Semantic Information Sciences and Technology (InSIST), with centers in Mumbai and Berkeley (<http://insist.ac.in>).

Prof. Gomatam is developing an exciting and new concept of matter called “objective semantic information” (OSI), via his work in macroscopic quantum mechanics. OSI can be and is being applied at InSIST to all other fields of science & technology. Prof. Gomatam’s research is at an advanced stage of achieving fruition.

POSITIONS HELD

<i>Director</i> , Institute of Semantic Information Sciences & Tech. (www.insist.ac.in)	2008-Present
<i>Adjunct Professor</i> , Birla Institute of Technology and Science (BITS), Pilani, India	1997-Present
<i>Director</i> , Bhaktivedanta Institute (www.bvinst.edu), Berkeley & Mumbai	1979-Present
<i>Proprietor</i> , ELGO Computer Consultants, Detroit Michigan	1977-1983
<i>Staff Consultant</i> , Mgmt. Infn. & Advisory Services Division, Air-India, Mumbai	1974-1977

VISITING SCHOLAR

University of Pretoria, South Africa, Department of Mathematics	2000
Loyola University, New Orleans, Department of Philosophy	2001

REVIEWER FOR JOURNALS

- Synthese
- Journal of Consciousness Studies
- Proceedings of National Academy of Sciences, India Section A (Physical Sciences)

RESEARCH FOCUS – A BRIEF SKETCH

At present, Dr. Gomatam is working on developing his own version of ‘macroscopic quantum mechanics’ (MQM), by introducing a new conception of matter called ‘Objective Semantic Information’

(OSI). It is conceived as a new state of matter represented by the quantum mechanical wave function Ψ when used to directly describe the objects of the macroscopic *phenomenal* world. To motivate this kind of thinking within physics, Dr. Gomatam has had to develop many new ideas within philosophy of physics first – such as ‘Relational Properties’ (in-between primary and secondary properties), as well his own version of scientific realism (Tandem Realism).

His publications are receiving attention. For example, in the spring of 2010, one of his papers was part of the curriculum for a course in quantum mechanics at Brown University, USA, an Ivy-league university. Regarding his notion of ‘Relational Properties’ as a new range of physical properties corresponding to quantum mechanical observables, and as ‘in-between’ primary and secondary properties, a Nobel laureate remarked:

“I was very interested in the talk by Dr. Ravi Gomatam . . . because he showed, by some nice arguments, that the proper way to think of quantum mechanics is in terms of relationships This is a new way of thinking. It may be that this is how we should be doing science”.

(Brian Josephson, Nobel Laureate; Plenary talk at the
“Quantum Approaches to Consciousness” Conference, Arizona, USA; August 1999)

Another appreciation of this work is the following:

“We agree with Gomatam (1999) who argues for a revision of our notion of macroscopic objects in accord with quantum non-separability. Indeed, the key to progress may lie in a willingness to abandon stalwart concepts of dynamism such as energy, momentum, force.”

(Stuckey M.W. (2000) Uniform Spaces in the
Pregeometric Modeling of Quantum Non-Separability; A NATO-funded paper. arXiv: gr-qc/0003104v2)

For more scholarly appreciations, see: <http://www.insist.ac.in/appreciations>

RESEARCH PUBLICATIONS

1. Gomatam, R. (forthcoming), Toward Relational Reality--From Einstein and Tagore to Gaudiya Vaishnava Vedanta, in Partha Ghose (editor), *Einstein, Tagore and the Nature of Reality*, Pickering and Chatto Publishers (a division of Taylor and Francis/Routledge).
2. Gomatam, R. (2015), *Objective Semantic Information and Quantum Local Causality*, Presented at the conference, “Causality in a Quantum World”, August 16-21. This conference was part of a project at the University of Queensland entitled, “Causal Power of Information in a Quantum World”.
3. Gomatam, R. (2015), *Toward Avoiding Nonlocality (and Locality) in Quantum Physics*, Proceedings of the Pacific Division of the American Association for the Advancement of Science, Vol 34 (1), June 14-17, 2015, p. 145

4. Gomatam, R. (2014), *Toward Placing the Concept of 'Chemical Element on a New Quantum Footing*, Annual Meeting of the International Society for the Philosophy of Chemistry, July 7-9, 2014, London
5. Gomatam, R. (2014), *Tandem Realism--Physics and Commonsense*, Submitted for presentation at The International Conference for Integrated History and Philosophy of Science (&HPS5), June 26-29, 2014, Institute Vienna Circle and Department of Philosophy, University of Vienna.
6. Anderson, G., Gomatam, R., Behera, L. (2013), *Contradictions in the Quantum Mechanical Explanation of the Periodic Table*, International Conference on Mathematical Modeling in Physical Sciences, IC-MSQUARE, September 1-5, 2013, Prague.
7. Gomatam, R. (2013), *Gomatam's Critique of the Central Dogma of Molecular Biology*, Chapter 9, *Biology and Information*, Kanwaljeet Kaur, M.S. Dissertation, Bhaktivedanta Institute.
8. Gomatam, R. (2012), *A Quantum Model of Human Perception*, International Conference on Biologically Inspired System Science, March 1-3, IIT, Jodhpur, India.
9. Gomatam, R. (2012), *How Do Classical and Quantum Probabilities Differ?* in Khrennikov, A. (Ed.), *Foundations of Probability and Physics-6*, Conference Proceedings Series, American Institute of Physics, pp. 105-110.
10. Gomatam, R. (2010), *Macroscopic Quantum Mechanics and System of Systems Design Approach*, Indo-US Workshop on Systems Engineering, Oct. 26-28, IIT, Kanpur.
11. Gomatam, R. (2009), *Quantum Theory, the Chinese Room Argument and the Symbol Grounding Problem*, in Bruza, P. et al. (Eds.), *Lecture Notes in Computer Science*, Volume 5494, pp. 174-183, Springer.
12. Gomatam, R. (2008), *Quantum Realism and Haecceity*, in Ghose, P. (Ed.), *HSPCIC Vol. XII: Levels of Reality*, CSC, New Delhi, pp. 853-872.
13. Gomatam, R. (2007), *Niels Bohr's Interpretation and the Copenhagen Interpretation-- Are the two incompatible?* *Philosophy of Science*, December, **74**(5), pp. 736-748.
14. Gomatam, R. (2005), *Popper's Propensity Interpretation and Heisenberg's Potentia Interpretation — A Comparative Assessment*, in Chattopadhyaya, D. P. and Sengupta, P. (Eds.), *HSPCIC: A Historical Perspective Of The Evolution Of Ideas In Science, Vol. XIII, Part 6 , Probabilities, Propensity and Corroboration*, CSC: New Delhi, pp. 301-312.
15. Gomatam, R. (2005), *Do Hodgson's propositions uniquely characterize free will?* Invited commentary on a target paper, "A Plain Person's View of Free Will" by David Hodgson, *Journal of Consciousness Studies*, **12**(1), pp. 32-40, Imprint Academic: UK.
16. Gomatam, R. (2004), *Physics and Common Sense--Relearning the Connections in the Light of Quantum Theory*, in Chattopadhyaya, D.P. & Sen Gupta, A.K. (Eds.), *HSPCIC, Vol. XI, Part I: Philosophical Consciousness and Scientific Knowledge*, CSC: New Delhi, pp. 179-207.

17. Gomatam, R. (2004), *Quantum Theory and Experimental Praxis — Shall the twain ever meet?* Paper read at the annual meeting of Canadian Society for the History of Philosophy of Science (CSHPS), Winnipeg, Canada, May 30- June 1.
18. Gomatam, R. (2004), *Complementarity - Did Bohr miss the boat?*, paper read at 5th International History of Philosophy of Science Conference (HOPOS), June 24-27, San Francisco.
19. Gomatam, R. (2003), *Against 'Position'*, paper read at the annual meeting of the Canadian Society for the History of Philosophy of Science (CSHPS), May, Halifax, Canada.
20. Gomatam, R. (2002), *What is Niels Bohr's Interpretation?* paper read at annual meeting of the Canadian Society for the History and Philosophy of Science (CSHPS), Toronto, May 26-27.
21. Gomatam, R. (2002), *Einstein's Critique of Quantum Theory - A Reassessment*, paper read at *Fourth Biennial Congress* of History of Philosophy of Science (HOPOS), July 23-25, Concordia University, Montreal, Canada.
22. Gomatam, R. (1999), *Quantum Theory and Observation Problem*, *Journal of Consciousness Studies*, **6** (11-12), 1999, pp. 173-190.
23. Gomatam, R. (1999), *Quantum Information*, paper presented at the conference on *Quantum Approaches to Consciousness*, July 28-August 1, Northern Arizona University, Flagstaff, Arizona, USA.
24. Gomatam, R. (1998), *Toward a Consciousness-Based, Realist Interpretation of Quantum Theory-- Integrating Bohr and Einstein*, Ph.D. Dissertation, Department of Philosophy, Bombay University, India.
25. Gomatam, R. (1992), *Quantum Mechanics and Consciousness: Toward a Dual-Observer Theory of Measurement*, paper presented at the conference of American Philosophical Association (APA), Louisville, Kentucky, USA.
26. Gomatam, R. (1992), *Local Realism or Object Realism*, poster presentation, *Waves and Particles in Light and Matter: Workshop on the Occasion of Louis de Broglie's 100th Anniversary*, September 24-30, Trani, Italy.
27. Gomatam, R. (1991), *Quantum Mechanics and Reality*, paper presented at the conference of American Philosophical Association (APA), Central Division; Group session: Knowledge and Reality.
28. Gomatam, R. (1990), *Quantum Mechanics and Consciousness*, paper presented at the Annual Meeting of the American Philosophical Association – Western Division, Louisville, KY; Group session on Indian Philosophy.

29. Gomatam, R. (1987), *Real and Artificial Intelligence: Toward a hierarchical model of consciousness, intelligence, mind and body*, Bhaktivedanta Institute.

OTHER PRESENTATIONS

- Gomatam, R. (2011), *Objective Semantic Information – a New Framework for Understanding Quantum Reality*, talk at seminar Quantum Reality – New Perspectives, March 26, organized by Institute of Semantic Information Sciences & Technology (InSIST), Nehru Science Center, Mumbai, India.
- Gomatam, R. (2002), *What is Niels Bohr's Interpretation?*, Talk given at Colloquium on “Consciousness & Science”, held at the University of San Francisco, organized by Bhaktivedanta Institute, May 10.
- Gomatam, R. (1999), *Quantum Theory and Human Knowledge*, invited talk delivered at the symposium "From Technology to the Attainment of Wisdom" organized on the occasion of the 5th International Conference on Cognitive Systems, New Delhi, December 15.
- Gomatam, R. (1992), *Role of Consciousness in Quantum Mechanics*, Talk given at Colloquium on “Consciousness & Science” (1990-2003), held at the University of San Francisco, organized by Bhaktivedanta Institute, November 13.
- Gomatam, R. (1991), *Time in Eastern Metaphysics*, Talk given at Colloquium on “Consciousness & Science” (1990-2003), held at the University of San Francisco, organized by Bhaktivedanta Institute, August 9.
- Gomatam, R. (1990), *Mind and Symbol Generation*, talk given at the First International Conference for the Study of Consciousness within Science, San Francisco, February 17-18.
- Gomatam, R. (1990), *Foundational Issues in Artificial Intelligence*, Talk given at Colloquium on “Consciousness & Science” (1990-2003), held at the University of San Francisco, organized by Bhaktivedanta Institute, November 9.

OTHER PUBLICATIONS

Prof. Gomatam was invited to guest edit the December 2005 issue of the monthly magazine of the Computer Science of India, brought out in honor of the Centennial of Einstein's Annus Mirabilis (1905). The special issue was themed “Physics, Philosophy and Information Technology”. Besides getting many distinguished authors to contribute to the special volume, Gomatam wrote the guest editorial *Physics, Philosophy and IT* as well as a special article *Quantum Physics and Philosophy*.

LETTERS

- Gomatam, R. (2006), Letter to the Editor, *Physics Today*, April 2006, 59(4), pp.10-12; A response to Nobel Laureate Steven Weinberg's article 'Einstein's Mistakes' (*Physics Today*, October, 2005).
- Weinberg's response on Gomatam, R., (2006) *Physics Today*, April 2006, 59(4), p. 15.

BOOK REVIEW

Quantum Dialogue: The Making of a Revolution (Science and Its Conceptual Foundations series, Mara Beller, University of Chicago Press 1999. Philosophy in Review, 20 (6), December 2000, pp. 390-2.

SCIENTIFIC CITATIONS

Prof. Gomatam's work has been cited by scholars from a wide spectrum of fields such as neurosciences, artificial intelligence, control systems engineering, quantum chemistry, mathematics, computer science and marketing theory.

A. IN TEXTBOOKS, PHD THESES AND PUBLISHED PAPERS

1. Zizzi, P. *From Quantum Metalanguage to the Logic of Qubits* PhD dissertation, School of Mathematical Sciences, University of Padua, 2011
2. Pardalos, Panos M. [Industrial and Systems Engineering, University of Florida], Yatsenko, Vitaliy [Institute of Space Research NASU-NSAU, Ukraine], *Optimization and control of bilinear systems: theory, algorithms, and applications*, 2008
3. Hunt, Shelby D. [Marketing, Michigan State University] "Marketing Theory: Foundations, Controversy, Strategy, Resource-Advantage Theory" 2010
4. Fernandes, F.M.S.S. [Department of Chemistry and Biochemistry, University of Lisboa, Portugal], "The Interpretation of Quantum Mechanics", in Redinha, J.S., da Providencia, J., Varandas, A.J.C. (Eds), *Quantal Aspects in Chemistry and Physics*, 2009, pp. 45-78
5. Nani, Andrea [School of Psychology, University of Turin, Italy] and Cavanna, Andrea E. [Dept. of Neuropsychiatry, University of Birmingham, UK], "Brain, Consciousness and Causality", *Journal of Cosmology*, 2011, Vol. 14
6. Stuckey, W.M. [Dept of Physics, Elizabethtown], "On a Pregeometric Origin for Spacetime Dimensionality and Metric Structure", 2002, NATO Funded
7. Stuckey, W.M. "Causality as a Casualty of Pregeometry" (2003) in *The Nature of Time: Geometry, Physics and Perception*, pp. 353 – 362, Proceedings of NATO Advanced Research Workshop

8. MacKinnon, Edward [California State University], “Generating Ontology: From Quantum Mechanics to Quantum Field Theory” 2005, Phil-sci Archives, 2467
9. Ghose, Partha [Dept. of Physics, Bose Institute, Calcutta], “The General Mystery of Quantum Mechanics” 2009
10. Erol, Mustafa [Department of Physics Education, DokuzEylül University, Turkey]. “Philosophy and Instruction of Quantum Physics”
11. Krishna, K. Madhava [Dept. of Electrical Engg., Indian Institute of Technology, Kanpur], Kalra, Prem K. [Dept. of Electrical Eng., Indian Institute of Technology, Kanpur, India] “Spatial understanding and temporal correlation for a mobile robot”, *Spatial Cognition and Computation*, 2(3), pp. 219-259, 2000

B. ON WEBSITES

- Stanford Encyclopedia of Philosophy: <http://plato.stanford.edu>
- Department of Physics and Astronomy, University of Mississippi: <http://www.phy.olemiss.edu>
- Japan Science and Technology Agency: J-Global: <http://jglobal.jst.go.jp>

C. REVIEW OF PROF. GOMATAM’S PAPERS

B.V. Sreekantan [Indian Institute of Science Campus, Bangalore], review of Gomatam’s paper “Popper’s Propensity Interpretation and Heisenberg’s Potential Interpretation — A comparative assessment”. Review published in journal “Current Science,” 99(9), November, 2010, p.1268.

D. CITED AT ONLINE LIBRARIES

1. SAO/NASA Astrophysics: <http://www.adsabs.harvard.edu>
2. Cornell University Library: <http://arxiv.org>
3. Dept of Energy (USA): <http://worldwidescience.org>
4. Association for Computing Machinery: <http://dl.acm.org>
5. German National Library of Science and Technology: <https://getinfo.de>
6. Complutence University, Madrid (Established 1293): <http://www.ucm.es>
7. Ningbo digital library, China: www.nbdl.gov.cn
8. Saratov Governmental University Library, Russia: <http://www.sgu.ru>
9. Ritsumeikan University, Japan: <http://www.ritsumei.ac.jp>

SOME POPULAR SCIENCE LECTURES

- University of California, Berkeley. 16 November 2011; '*Quantum Reality – Why Physicists do not understand it yet?*'
- Tulane University, Louisiana. 27 September, 2011; '*Matter & Consciousness – How are the two related?*'
- IIT-Chennai, India; REFLECTIONS Student Club; 06 March, 2012. '*Quantum Reality*'

DISSERTATIONS SUPERVISED

Principal Advisor

- Kaur, Kanwaljeet (2013), "*Biology and Information*", M.S. Thesis
- Anderson, Greg (2007-), "*On improving the quantum mechanical explanation of the Periodic Table*" Ph.D., BITS, Pilani
- Vinod, P. (2003), "*Visual Illusions: Significance of context*", M.S. Thesis
- Saberi, R. (2003), "*The Problem of Causality in Science*", M.S. Thesis

Consultant Supervisor

- Widolf, E. (2002), "Understanding of Natural Resources: Contemporary Environmental Policy and the Polar Regions", University of Tasmania, Hobart, Australia