

Mr. [Posina Venkata Rayudu](#)

Date of Birth: 11 October 1969

Bengaluru, Karnataka, India

[Google Scholar Profile](#); [ORCID ID](#)posinavenkatarayudu@gmail.com; +91-963-222-4686**SCIENTIFIC AGENDA**

Posina Venkata Rayudu is engaged in I. Making mathematics universally comprehensible and usable, II. Abstracting the architecture of mathematics by statistical gamification of mathematical definitions, III. Establishing mathematics as the science of knowing i.e., cognitive science, IV. Objectifying quality zero, which is totally devoid of structure, that can serve as a contamination-free pure background to model cohesively varying objects of our everyday experience, V. Charactering a category of Reflecting needed, in addition to the familiar categories of Being and Becoming, to account for the comprehensibility of reality (which befuddled Einstein), VI. Establishing Dharma (Becoming consistent with Being) as the Zeroth Law of Change/Motion (that Newton failed to abstract), VII. Compounding epistemology (algebra) and ontology (geometry) into which reality (mathematics) is resolved, and VIII. Constructing the space of all mathematical answers to the question: What is consciousness?

PAPERS (published)

Posina VR (2020) Hard, harder, and the hardest problem: The society of cognitive selves, **Tattva - Journal of Philosophy** 12(1): 75-92 [[full text](#)].

Posina VR (2017) Symbolic conscious experience, **Tattva - Journal of Philosophy** 9(1): 1-12 [[full text](#)].

Posina VR, Ghista DN, and Roy S (2017) Functorial semantics for the advancement of the science of cognition, **Mind & Matter** 15(2): 161-184 [[full text](#)].

Posina VR (2016) Truth through nonviolence, **GITAM Journal of Gandhian Studies** 5(1): 143-150 [[full text](#)].

Kim WK, Choi YB, *Posina VR*, Das P, Assad W, Arnelle DR, Stamler JS, and Lipton SA (1999) Attenuation of NMDA receptor activity and neurotoxicity by nitroxyl anion NO⁻, **Neuron** 24(2): 461-469 [[full text](#)].

Chen HSV, Wang YF, *Posina VR*, Edgecomb P, Neill JC, Segal MM, Lipton SA, and Jensen FE (1998) Neuroprotective concentrations of the NMDA open-channel blocker memantine are effective without cytoplasmic vacuolization following post-ischemic administration and do not block maze learning, **Neuroscience** 86: 1121-1132 [[full text](#)].

Das S, Sasaki YF, Rothe T, Premkumar LS, Takasu M, Crandall JE, Dikkes P, Connor DA, *Posina VR*, Cheung W, Chen HSV, Lipton SA, and Nakanashi N (1998) Increased NMDA current and spine density in mice lacking the NMDAR subunit NR3A, **Nature** 393: 377-381 [[full text](#)].

Lipton SA, Kim WK, Choi YB, Kumar S, Demilia DM, *Posina VR*, Arnelle DR, and Stamler JS (1997) Neurotoxicity associated with dual actions of homocysteine at the N-methyl-D-aspartate receptor, **Proc Natl Acad Sci USA** 94: 5923-5928 [[full text](#)].

BOOK CHAPTERS (published)

Posina VR and Roy S (2022) Objective logic of consciousness, In: **Perception and Cognition**, B. Bhattacharya and S. Roy (eds.), Nalanda: Nava Nalanda Mahavihara, pp. 97-130 [[full text](#)].

Posina VR (2022) Gandhi's *Satya*: Truth entails peace, In: **Gandhi in the Twenty First Century**, A. Behera, and S. Nayak (eds.), Singapore: Springer Nature, pp. 189-198 [[full text](#)].

Lipton SA, *Posina VR*, Choi YB, Sucher NJ, and Chen HSV (1998) Redox modulation of the NMDA receptor by NO-related species, **Progress in Brain Research** 118: 73-82 [[full](#)

[text](#)].

Kim WK, Posina VR, Mullins ME, Stamler JS, and Lipton SA (1996) Down regulation of NMDA receptor activity in cortical neurons by peroxy nitrite, In: **The Biology of Nitric Oxide**, J. S. Stamler, S. Gross, and S. Moncada (eds.), London: Portland Press.

Lipton SA, Kim WK, Posina VR, Assad W, Arnelle DR, and Stamler JS (1996) Singlet and triplet nitroxyl anion (NO⁻) lead to N-methyl-D-aspartate (NMDA) receptor down regulation and neuroprotection, In: **The Biology of Nitric Oxide**, J. S. Stamler, S. Gross, and S. Moncada (eds.), London: Portland Press.

INVITED LECTURES

Posina VR (2023) Mind-matter problem solved! National Institute of Advanced Studies, Bengaluru [[ppt](#), [full text](#)].

Posina VR (2022) Concept of Śūnyatā in Buddhist philosophy & Category theory, **International Conference-cum-Workshop on Zero**; joint work with Sisir Roy [[video](#)].

Posina VR (2021) On writing well, **Dr. Verghese Kurien Centenary**, Institute of Rural Management Anand, Gujarat [[ppt](#), [full text](#)].

Posina VR (2020) Objective logic of consciousness, **14th Nalanda Dialog**, Nava Nalanda Mahavihara, Nalanda [[full text](#)].

Posina VR (2019) Indian artificial intelligence, **Round Table on Artificial Intelligence**, Indian Institute of Management, Bengaluru [[full text](#)].

Posina VR (2018) Reconstructing reality from appearances, **Frontiers of Consciousness**, Montfort College, Bengaluru [[ppt](#)].

Posina VR (2016) Reflective parts of reality, **NIAS World Philosophy Day Seminar**, National Institute of Advanced Studies, Bengaluru [[full text](#)].

Posina VR (2015) Space: From container to cohesion and quality, **INSIGHTS: Exploring Fundamental Concepts & Foundational Questions**, National Institute of Advanced Studies, Bengaluru [[full text](#)].

PAPERS (under review/revision)

Posina VR (2023) Can AI abstract the architecture of mathematics? (**Nature Machine Intelligence** [[full text](#)]).

Posina VR (2022) For the sake of the mind, cancel Kahneman (**MIND** [[full text](#)]).

Posina VR (2021) Time, in COVID times (**Perception** [[full text](#)]).

Posina VR (2021) In education we trust [[full text](#)].

Posina VR (2020) Structure and logic of conceptual mind (**Mind & Society** [[full text, reviews](#)]).

Posina VR (2020) Development of clinically-tolerated NMDA receptor antagonists (**Biomedical Engineering in Translational Medicine**, Institute of Physics [[full text](#)]).

Posina VR (2019) Conscious experience and designing user experiences ([[full text, reviews](#)]).

Posina VR (2019) Mathematics for cognitive science ([[full text, reviews](#)]).

Posina VR and Albright TD (2020) Neuronal adaptations to environmental change: Recalibration of the red-green color opponent system (**Proc Natl Acad Sci USA** [[full text](#)]).

Posina VR, Nathan HSK, and Behera A (2018) Reformatting reviews for scientific progress [[full text](#)].

Posina VR, Ramasubramanian S, and Natarajan S (2020) Functional relationship between NMDA receptor-mediated synaptic current duration and Hebbian learning (**Biomedical Engineering in Translational Medicine**, Institute of Physics [[full text](#)]).

Posina VR and Roy S (2022) Isbell conjugacy for developing cognitive science (**Cognitive Science** [[full text](#)]).

Posina VR and Roy S (2020) Category theory and the ontology of Śūnyata (**Monograph on Zero** [[full text](#)]).

Posina VR and Roy S (2017) Category theoretic formalization of qualia space ([[full text](#), [reviews](#)]).

TEXTBOOK (in preparation)

Posina VR (2017) Science of Knowing: Mathematics [[full text](#)].

LETTERS

Posina VR Balla and Shankar (2021) Universal yearning for understanding, **Science** (eLetter, 01 Aug [[full text](#)]).

Posina VR (2021) Magical thinking and lying in the time of crisis, **Proc Natl Acad Sci USA** (online comment, 25 May [[full text](#)]).

Posina VR (2020) On making sense of science, **Neuron** (online comment, 06 Oct [[full text](#)]).

Posina VR (2020) Lancet, Nature, and fake news, **Science** (eLetter, 05 Jun [[full text](#)]).

Posina VR (2020) Brain is a property type, **Science** (eLetter, 26Apr [[full text](#)]).

Posina VR (2020) Moral responsibility, **Science** (eLetter, 17Apr [[full text](#)]).

Posina VR (2019) Theories of consciousness, **Science** (eLetter, 20 Oct [[full text](#)]).

Posina VR (2019) Reality and reason, **Proc Natl Acad Sci USA** (online comment, 26 Jul [[full text](#)]).

Posina VR (2018) Deep history of extended body, **Nature** (online comment, 01 Oct [[full text](#)]).

Posina VR (2018) Advancing artificial intelligence, **Science** (eLetter, 09 May [[full text](#)]).

Nathan HSK and *Posina VR* (2016) Indivisible morality, **Nature** (online comment, 11 May [[full text](#)]).

POETRY

Posina VR (2022) Artefacts of articulation, **Mercurius** [[full text](#)].

PAPERS (unpublished)

Posina VR, Stoner GR, and Albright TD (2007) On neural correlates of categorical motion perception [[full text](#)].

Posina VR, Brown R, and Porter T (2003) Higher dimensional algebraic study of brain functions [[full text](#), [reviews](#)].

CONFERENCES ORGANIZED

International Conference on Theoretical Neurobiology, National Brain Research Centre, New Delhi, India, 24-26 February 2003 [[Programme](#)].

World Philosophy Day, National Institute of Advanced Studies, Bengaluru, India, 17 November 2016 [[Programme](#)].

EDUCATION

B. Tech (Electrical & Electronics Engineering) 1987-1991
Jawaharlal Nehru Technological University, Kakinada, Andhra Pradesh

Graduate Student 1992-1999
Cognitive and Neural Systems, Boston University; Harvard Medical School, Boston

TEACHING EXPERIENCE

Gamification of Mathematics (2022) Why does $1 + 1 = 2$? [[game video](#)].

Neuroscience in User Experience
(M. Des. students, National Institute of Design, Bengaluru, Sep 2021 [[lecture videos](#)])

Conceptual Mathematics Seminar Series
(Faculty and PhD students, Center for Foundational Study, Poornaprajna Institute of Scientific Research, Bengaluru, Aug-Oct 2021 [[Google group](#)])

Neuroscience for User Experience Design
(M. Des. students, National Institute of Design, Bengaluru, Sep 2020 [[lecture video](#)])

Consciousness and Design
(M. Des. students, National Institute of Design, Bengaluru, Aug 2019)

Conceptual Mathematics

(Faculty and PhD students, National Institute of Advanced Studies, Bengaluru, Aug-Dec 2016)

Introduction to Consciousness Studies

(Neurophysiology and Vision; PhD students, National Institute of Advanced Studies, Bengaluru, Aug-Dec 2015)

Conceptual Mathematics for Cognitive Neuroscience

(PhD students, National Institute of Advanced Studies, Bengaluru, Aug-Dec 2015)

Conceptual Mathematics

(Scientists and post-doctoral fellows, The Salk Institute, San Diego, Jan-Dec 2011 [[Salk Conceptual Mathematics study group](#)])

Cognitive Neuroscience

(M.S. students, BITS Program in Consciousness Studies, Mumbai, Aug-Dec 2001)

Technical Writing

(M.S. students, BITS Program in Consciousness Studies, Mumbai, Aug-Dec 2001)

Biomathematics

(B.E. students, Biomedical Engineering, Osmania University, Hyderabad, Aug-Dec 2000)

Bioelectricity

(B.E. students, Biomedical Engineering, Osmania University, Hyderabad, Aug-Dec 2000)

RESEARCH EXPERIENCE*Research Fellow*

2014-2017

Consciousness Studies Programme, National Institute of Advanced Studies, Bengaluru

Identified the parallels between mathematical knowing and ordinary cognition;
 Characterized the objective logic of conceptual mind.

Research Assistant 2013-2014

Centre for Gandhian Studies, GITAM University, Visakhapatnam

Highlighted the nonviolent nature of knowing.

Research Associate 2003-2012

The Salk Institute, La Jolla

Investigated neuronal adaptations to environmental change and neural correlates of meaning.

Research Associate 2001-2003

National Brain Research Centre, Delhi

Developed higher dimensional algebraic models of brain functions.

Academic Consultant 2000-2001

Department of Biomedical Engineering, Osmania University, Hyderabad

Category theoretic study of cognition.

Graduate Student 1992-1999

Harvard Medical School, Boston

Characterized electrophysiological properties of NMDA receptors; Developed mathematical models of neuronal death and clinically tolerated NMDA receptor antagonists; Discovered a learning law governing associative learning.

CONFERENCE PROCEEDINGS

Posina VR (2003) Towards an Algebra of Neural Processing of Contextual Information, In: **Proceedings of the International Conference on Theoretical Neurobiology**, Singh NC (ed.), Delhi: National Brain Research Centre.

Ravindranath V and Posina VR (2002) Neuroinformatics: Indian Perspective, **Neural Information Processing 4: 2017-2021** [[full text](#)].

Posina VR and Ghista DN (2001) Mathematical Constructs of Notions of the Science of Knowing, In: **International Conference on Mathematical Modelling**, Singh et al. (eds.), New Delhi: Tata McGraw-Hill.

CONFERENCE PRESENTATIONS

Posina VR and Albright TD (2008) Plasticity of neuronal red-green mechanism, **Soc Neurosci.** [[abstract](#)].

Posina VR, Horwitz GD, and Albright TD (2006) Distinct temporal dynamics of cone-opponent and -nonopponent macaque primary visual cortical neurons, **Vision Sciences Society** [[abstract](#)].

Posina VR (2003) Higher dimensional algebraic study of brain functions, **International Conference on Theoretical Neurobiology**, Delhi.

Posina VR (2002) Brain as mathematics, **4th Japan-Korea-China-India Joint Workshop on Neurobiology & Neuroinformatics**, Tokyo.

Posina VR and Ghista DN (2002) Replacing the ad-hoc models of computational neuroscience with data-driven models, **Annual Meeting of Indian Academy of Neuroscience**, Calcutta.

Posina VR and Ghista DN (2002) Category theoretic study of cognitive neuroscience, **Indo-US Symposium on Brain Research**, Delhi.

Posina VR and Ghista DN (2001) Vehicles and pathways of "First-Person Science", **International Conference on Biomedical Engineering**, Chennai.

Posina VR (2001) Neurology calculus: Modelling of neurological diseases and engineering therapeutic strategies, **International Conference on Biomedical Engineering**, Chennai [[full text](#)].

Posina VR and Ghista DN (2000) Rudiments of the science of knowing, **1st International Conference on Neurology, Language, and Cognition**, Trivandrum.

Posina VR and Lipton SA (1999) Functional relationship between NMDA receptor-mediated epsc duration and Hebbian learning, **International Colloquium on Brain Research**, Delhi.

Posina VR, Demilia DM, Gaudiano P, and Lipton SA (1997) Apoptosis vs. necrosis: role of Ca²⁺ and energy failure, **Soc Neurosci.** 23: 2291 [[abstract](#)].

Lipton SA, *Posina VR*, and Chen HSV (1997) Development of clinically tolerated NMDA receptor antagonists, **Soc Neurosci.** 23: 1762 [[abstract](#)].

Lipton SA, Kim WK, *Posina VR*, Asad W, Arnelle DR, and Stamler JS (1997) Nitroxyl anion (NO⁻) decreases NMDA receptor activity and neurotoxicity, **Neurology** 48: A81-A82.

Posina VR, Chen HSV, and Lipton SA (1996) Memantine, a clinically tolerated NMDA open-channel blocker, displays relative sparing of epscs, **Soc Neurosci.** 22: 1537.

Lipton SA, Kim WK, Choi YB, Kumar S, *Posina VR*, Arnelle DR, and Stamler JS (1996) Dual actions of homocysteine at the N-methyl-D-aspartate receptor, **Neurology** 46: A264-A265.

Posina VR, Chen HSV, and Lipton SA (1995) High-voltage-activated calcium currents sensitive to w-AGA-IVA and w-CTx-MVIIC in rat retinal ganglion cells, **Soc Neurosci.** 21: 389.

Kim WK, *Posina VR*, Choi YB, Kumar S, Stamler JS, and Lipton SA (1995) Homocysteine: an NMDA agonist and glycine site partial antagonist that induces cortical neurotoxicity, **Soc Neurosci.** 21: 521.

Lipton SA, Kim WK, *Posina VR*, Mullins ME, and Stamler JS (1995) Peroxynitrite down regulates NMDA receptor activity in rat cortical neurons, **Soc Neurosci.** 21: 736.

Lipton SA, Kim WK, *Posina VR*, Assad W, and Stamler JS (1994) Redox congener of nitric oxide with one additional electron (NO⁻) down regulates NMDA receptor activity and ameliorates neurotoxicity, **Soc Neurosci.** 20: 649.

Posina VR, Zhang D, Chen HSV, and Lipton SA (1994) NMDA- and glycine-activated currents of rat retinal ganglion cells are inhibited by methylene blue. **Soc Neurosci.** 20: 736.