

# 11th International Conference **SCIENCE & SCIENTIST 2023:**

*Life & Cognition at the Intersection  
of Science, Philosophy, & Religion*



**Online**

**Sunday, December 17, 2023**

6:30 AM - 3:30 PM | ET USA

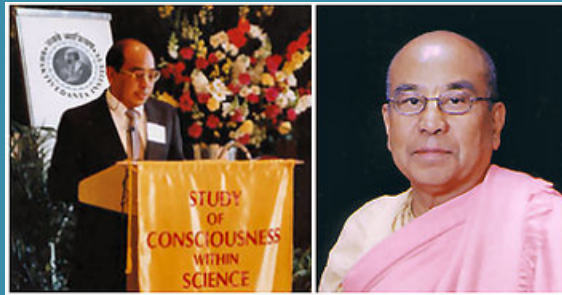
11:30 AM - 8:30 PM | UK

5:00 PM - 2:00 AM | IN

**Organizers**



**This conference is being held on the eve of the birth of Bhaktisvarup Damodara Maharaja, PhD (Dr. T.D. Singh), Founding Director of the Bhaktivedanta Institute.**



***Some questions this conference hopes to address...***

*What is the value in embracing teleological (purposiveness/goal-directedness) explanations of natural phenomena at the molecular, cellular, organismic, and ecological levels?*

*What is the significance of the varied degrees to which living entities from cells to organisms express volition, cognition/consciousness, and emotion?*

*What is the value of Vedāntic studies for modern scientific approaches to comprehending life and cognition/consciousness?*

*What does Vedānta contribute to contemporary philosophical considerations of consciousness and Spirit?*

## **About Conference Topic**

In her 1983 Nobel lecture, Barbara McClintock challenged 21st-century science to “determine the extent of knowledge the cell has of itself, and how it utilizes this knowledge in a ‘thoughtful’ manner when challenged.” Since then, significant scientific progress has been made in recognizing that all cells are cognitive and that they exercise self/nonself discrimination in various ways. These discoveries proved Humberto Maturana’s hypothesis that “[l]iving systems are cognitive systems and living as a process is a process of cognition [...] for all organisms with and without a nervous system” and challenge theories that reduce cognition/consciousness to neuronal correlates, “the minimum neuronal mechanisms jointly sufficient for any one specific conscious experience,” since a single nerve cell already exhibits conscious decision making.

These discoveries also prompted scientists to recognize the need to clarify the concept of “self.” While such efforts advocate a non-reductionist systems approach, they avoid the first-person perspective of selfhood in favor of third-person perspectives. But the first-person perspective is the only concrete account we have of the self. This situation demonstrates the necessity for phenomenological approaches to self-inquiry that transcend systems thinking by embracing conceptual thinking. G.W.F. Hegel’s philosophy demonstrates this method’s applicability for comprehending Logic, Nature, and Spirit. Humanities scholars at Princeton University have conducted several programs engaging with Hegel’s philosophy since 2017, including one individual (now a Research Associate at the Institute for Advanced Study in Princeton) currently studying Hegel’s logical category of life, its transition to the category of cognition, and the implications this has for comprehending organic life and artificial intelligence.

Vedānta philosophy describes that our consciousness determines our experience, i.e. our knowledge of objects and the world determines the world we live in and how we perceive those objects. To the extent that “embodied cognition” refers to the understanding that cognition/consciousness is enmeshed in the relationship between a body and interactions with its environment, it coincides with Vedāntic knowledge in that cognition/consciousness is intertwined in the relationship between a body and its interactions with the environment, but understanding the body as a material thing intended to exploit the environment to maximize individual enjoyment produces a very different experience than identifying as spirit fixed in uninterrupted joyful loving service to the Supreme.

We hope to clarify the distinction between cognition and consciousness to accurately determine the various behaviors of particular living entities. An etymological analysis suggests considering cognition as a less sophisticated faculty than consciousness. Cognition is an initial step of mediated thought where an object is reflected into the mind and a preliminary mental representation is formed, which is enough to navigate the relatively simplistic experience of cellular life and other lower lifeforms such as insects and plants. The phrase “lower lifeforms” is not being used in a derogatory way but to denote living entities whose activities seem mainly absorbed in exercising volition and cognition while responding to immediate environmental circumstances without exhibiting symptoms of a sophisticated internal emotional experience. Consciousness, on the other hand, denotes an identity-in-difference between subject and object that requires a dialectic approach to comprehend. This is a further development of thought where the conscious agent knows apparently external objects as identical to itself, as well as recognizing its difference from objects. In addition to exercising volition and cognition, conscious entities like elephants, cows, and humans have a more mediated relationship with their environment allowing them to form emotional attachments to things other than themselves. Scientists recognize that “there is continuity between humans and other animals in their emotional (and cognitive) lives; that there are transitional stages among species, not large gaps; and that the differences among many animals are differences in degree rather than in kind.” When one experiences an identity with something other than oneself, a feeling of inner connection is established. So, living cells may be volitional and cognitive, but not emotional. This indicates an evolution of consciousness throughout lifeforms where different stages of development are distinguished by the degree to which and particular manner in which a living entity expresses volitional, cognitive, and emotional activity.



# Schedule

INTL. TIMES (US ET)	SPEAKER(S)	TALK TITLE
15 min INTRODUCTION		
US   6:45 - 7:30 AM	Denis Noble (UK)	Purposive Explanations Are More Useful For Identifying Lower-Level Activity In Living Systems Than The Other Way Round
UK   11:45 AM - 12:30 PM		
IN   5:15 - 6:00 PM		
15 min Q&A		
US   7:45 - 8:30 AM	Brian J Ford (UK)	Superseding the Synaptic Network: How Cellular Complexity Transcends the Digital Neuron
UK   12:45 - 1:30 PM		
IN   6:15 - 7:00 PM		
15 min Q&A		
US   8:45 - 9:30 AM	B Madhava Puri (US)	Death & Desire: Negativity at the Foundation of Life
UK   1:45 - 2:30 PM		
IN   7:15 - 8:00 PM		
15 min Q&A		
US   9:45 - 10:25 AM	B Niskam Shanta (IN)	Understanding the Vedantic View on the Difference between Life & Non-Life
UK   2:45 - 3:25 PM		
IN   8:15 - 8:55 PM		
10 min Q&A		
US   10:35 - 11:15 AM	B Vijnana Muni (IN)	The Emotional Intelligence of Cows
UK   3:35 - 4:15 PM		
IN   9:05 - 9:45 PM		
10 min Q&A		
US   11:25 AM - 12:05 PM	Rajakishore Nath (IN)	The Problem of Embodied Consciousness in the Lens of Vedantic View of Consciousness
UK   4:25 - 5:05 PM		
IN   9:55 - 10:35 PM		
10 min Q&A		
US   12:15 - 12:55 PM	Anandi Ravinath (IN)	Journey into Mind - DNA - Consciousness
UK   5:15 - 5:55 PM		
IN   10:45 - 11:25 PM		
10 min Q&A		
US   1:05 - 1:45 PM	J Scott Turner (US)	Evolution is Cognitive Thermodynamics
UK   6:05 - 6:45 PM		
IN   11:35 PM - 12:15 AM		
10 min Q&A		
US   1:55 - 2:35 PM	Alicia Juarrero (US)	Complexity Theory & Purposiveness
UK   6:55 - 7:35 PM		
IN   12:25 - 1:05 AM		
10 min Q&A		
US   2:45 - 3:30 PM	Denis Noble Brian J Ford B Madhava Puri Anandi Ravinath J Scott Turner Alicia Juarrero James A Shapiro	INTERDISCIPLINARY DIALOGUE
UK   7:45 - 8:30 PM		
IN   1:15 - 2:00 AM		
END		

## Abstracts



Denis Noble, CBE, PhD, FRS  
Oxford University  
Latest book: *Understanding Living Systems* (2023)

*Professor Emeritus and co-Director of Computational Physiology at Oxford University. One of the pioneers of Systems Biology and developed the first viable mathematical model of the working heart in 1960. Over 350 articles in academic journals, including Nature, Science, PNAS, Journal of Physiology.*

### **Purposive Explanations Are More Useful For Identifying Lower-Level Activity In Living Systems Than The Other Way Round**

Physiology shows that higher-level functionality, including purposive explanations, are more successful in predicting lower-level, microscopic and molecular events than the other way round (Noble & Noble, 2023a, 2023b, 2023c). This is why GWAS association scores for most genes are abysmally low. So low, that they cannot be relied on to predict later life disease states (Hingorani et al, 2023). The reason is that low-level events are constrained by higher-level organisation by determining the boundary conditions under which those events operate.

#### References:

- Hingorani, A.D. et al 2023. Performance of polygenic risk scores in screening, prediction, and risk stratification: secondary analysis of data in the Polygenic Score Catalog. British Medical Journal. e000554. doi:10.1136/ bmjmed-2023-000554
- Noble R. & Noble, D. 2023a. Physiology restores purpose to evolutionary biology. Biological Journal of the Linnean Society. 139, 357-369.
- Noble D. & Noble, R. 2023b. How purposive agency became banned from evolutionary biology. In Corning et al (Eds) Evolution 'on purpose'. MIT Press. 221-235.
- Noble R. & Noble, D. 2023c. Understanding Living Systems. Cambridge University Press.

#### **Talk time + 15 min Q&A:**

US | 6:45 - 7:30 AM

UK | 11:45 AM - 12:30 PM

IN | 5:15 - 6:00 PM

#### **Participating in**

**interdisciplinary dialogue:**

2:45 PM ET US / 7:45 PM UK /

1:15 AM IN



Brian J Ford, Hon FRMS, Hon FLS  
Cardiff University  
Latest book: *Nonscience Returns* (2020)

*Fellow of Cardiff University since 1986. Independent research biologist, author, and lecturer, publishing on scientific issues for the general public. Television personality for over 40 years. International authority on the microscope. Received the Ernst Abbe medal awarded by the New York Microscopical Society in 2020.*

### **Superseding the Synaptic Network: How Cellular Complexity Transcends the Digital Neuron**

Current digital models of cerebral function conceive of neurons as simplistic go- or no-go gates. They are regarded as organic transistors. My investigations over the decades have drawn a very different conclusion; namely, that the neuron is a largely autonomous cell of unimaginable complexity. Whereas current conceptions treat of neural networks, insisting that the centers of data processing lie with the synapses (and the large numbers of possible permutations which govern how they connect), my view is that data-processing is essentially intracellular. Rather than being discrete components in a grander network, neurons are envisioned as thinking for themselves. Examples of complex cognitive and sentient behavior drawn from the microbial realm substantiate the conclusion that cells are complex, and are far from the simple processing units we currently claim. It is not the brain that we can compare to a computer, the neurons being analogous to transistors. Rather, each individual neuron is far more sophisticated than the most advanced computer we know.

#### **Talk time + 15 min Q&A:**

US | 7:45 - 8:30 AM

UK | 12:45 - 1:30 PM

IN | 6:15 - 7:00 PM

#### **Participating in**

**interdisciplinary dialogue:**

2:45 PM ET US / 7:45 PM UK /

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B Madhava Puri, PhD  
Princeton Bhakti Vedanta Institute  
Latest book: *Idols of the Mind vs. True Reality* (2020)

*Received PhD in Theoretical Chemistry from Georgetown University. Postdoc at the National Bureau of Standards in Washington DC. Published technical papers in The Journal of Chemical Physics. Turned to Indian school of yoga to learn about consciousness. Started GWFHegel.org. Serving Director of the Princeton Bhakti Vedanta Institute. Visionary behind this annual conference series since 2013.*

### **Death & Desire: Negativity at the Foundation of Life**

Life is a continuous activity of coming to be and ceasing to be at various scales. Positivist approaches understand living wholes through the lens of mechanism as mere aggregates of externally assembled parts. Approaches embracing negativity recognize the mutually dependent bi-directional internal causal relation among various parts and between parts and whole. A living individual is not just positive being but simultaneously negative or non-being, thus the production and dissolution of its parts facilitate growth and development as a dynamic coherent self. The boundary of the individual's sense of self (coming to be) and what is other than itself (ceasing to be) gives rise to relation with others in the environment as a living process. Determining what something is also reveals what it is not, i.e. taller implies not shorter and day implies not night. Hegel explains that the negative subjective aspect of the positive content of living entities is the concept, i.e. that which determines/contains the objective content. These two aspects mutually interpenetrate each other in dialectic relation as an identity-in-difference. This manifests as a discrepancy between the living individual and its environment. It experiences internal lacking i.e. desire to overcome the discrepancy through particular engagement with the external environment. One need is reproduction, which perpetuates the universal genus process (that all individuals participate in) when individuals die (cease to be). This emphasizes that which both transcends and is immanent in all living individuals, which is closer to the idea of soul in a body.

#### ***Talk time + 15 min Q&A:***

US | 8:45 - 9:30 AM  
UK | 1:45 - 2:30 PM  
IN | 7:15 - 8:00 PM

#### ***Participating in***

#### ***interdisciplinary dialogue:***

2:45 PM ET US / 7:45 PM UK /  
1:15 AM IN



B Niskama Shanta, PhD  
Sri Chaitanya Saraswat Institute

*Received PhD in Coastal Hydrodynamics from the Indian Institute of Technology - Kharagpur. Postdoc at the Korea Ocean Research and Development Center. Published numerous papers in international/national conferences and journals like Springer Link and Communicative & Integrative Biology (PMC). Main organizer of this Science & Scientist conference series. Vaishnava monk. Sevaite-President-Acharya of Sri Chaitanya Saraswat Math in Narashimapalli (Nabadwip Dham), West Bengal, India.*

### **Understanding the Vedantic View on the Difference between Life & Non-Life**

The conceptual differences between life and non-life are very difficult to understand within the framework of modern materialistic science. Modern science has painted an image of life as a very complex molecular arrangement, and thus there is no major difference between life and non-life except for an increase in complexity in molecular arrangements in the case of life. Despite that, science could never demonstrate how life can appear from non-life by increasing the complexity of molecular arrangements. However, in the Bhagavad-Vedantic tradition, the knowledge that we have of reality is very much dependent on our attitude. The concept of matter, or non-life, is an experience of souls who are not fully surrendered to the divine Absolute, and such souls live a material life in this material world. There is another reality that is transcendental to this material world, and there is no such duality that we experience as life and non-life. In this talk, the speaker wants to highlight these ideas with further details.

#### **Talk time + 10 min Q&A:**

US | 9:45 - 10:25 AM

UK | 2:45 - 3:25 PM

IN | 8:15 - 8:55 PM





B Vijnana Muni, PhD  
Sri Chaitanya Saraswat Institute

*Received PhD in Chemical Engineering from the Indian Institute of Technology - Kharagpur. Published peer-reviewed papers and book chapters in international conferences and journals like Springer Link. President of the Sri Chaitanya Saraswat Institute based in West Bengal, India. Vaishnava monk.*

### The Emotional Intelligence of Cows

In the Vedantic view of ancient Indic traditions, animals like cows, elephants, horses, etc., have a very high position in terms of their closeness to human beings and developmental stage among biological forms through the cycle of reincarnation. Cows give auspicious products like milk, cow dung, urine, curd, and Goroohana – all of which give benefits to human beings. In the Vedic view when cows are taken care, it reduces quarrels and sinful propensities among human beings. Ancient Indic societies maintained millions of cows in every village and state. Modern scientific and behavioural studies are also establishing that cows have well developed cognitive and learning abilities. Scientists have recorded changes in vocalizations and pulses according to different happy or stressful emotional conditions such as cognitive bias, emotional contagion, and mother-calf bonds. Cows are social animals and even human beings experience emotional benefits from them. In the Vedas it is mentioned that cows are one of the universal mothers. Many ayurvedic medicines are prepared from cow milk. The emotional nature of cows can be compared with those of other domestic animals such as buffaloes, dogs, goats, etc., to understand their unique and superior qualities. The Vedic view of living forms is that of organic whole and unity, yet cows have a higher social and spiritual position. Cows should be protected by governments and should never be killed. With proper care human society can gain all kinds of economic prosperity with more realizations of the potential of cow products in medicine, food, agriculture, and emotional well-being among humans and the environment.

#### **Talk time + 10 min Q&A:**

US | 10:35 - 11:15 AM

UK | 3:35 - 4:15 PM

IN | 9:05 - 9:45 PM



Rajakishore Nath, PhD  
Indian Institute of Technology (IIT) - Bombay

*Professor of Philosophy at IIT Bombay specializing in Artificial Intelligence, Philosophy of Mind and Cognitive Science. Published many peer-reviewed papers. On the Advisory Board for AI & Society: Knowledge, Culture and Communication by Springer.*

### **The Problem of Embodied Consciousness in the Lens of Vedantic View of Consciousness**

I would like to discuss embodied consciousness in the lens of Vedantic perspective. The Vedāntic perspectives of consciousness, especially Advaita and Vishistadvaita. Advaita perspective counters the embodied consciousness. The embodied theory consciousness has offered causal explanation to consciousness. The causal explanations are very much integration with the state of the organism with the environment. That is to say that the human consciousness depends on bodily gestures around the world. This kind explanation is based on the ground that consciousness is causally dependent on the material universe and that all conscious phenomena can be explained by mapping the physical universe. In this regard, consciousness is basically a bodily phenomenon and can be mechanically explained following the naturalistic methods of science. On the other hand, the Advaitins are proposing the concepts of Brahman and Ātman that are Absolute and are the source of all form of consciousness and the world. The pure consciousness, i.e., Ātman, cannot be 'known as an object of mediate knowledge, yet it is known as involved in every act of knowing'. Therefore, the nature of consciousness is transcendental. This transcendental nature of consciousness is ontologically real and very difficult to explain in the theory of embodied consciousness.

**Talk time + 10 min Q&A:**

US | 11:25 AM - 12:05 PM

UK | 4:25 - 5:05 PM

IN | 9:55 - 10:35 PM



Anandi Ravinath, MS  
Inner Light Foundation, Mumbai, India  
Latest book: *MIND Your DNA* (2019)

*Received MS in Biotechnology from IIT Bombay. Advisor and Member of the Council of Advisors for Taksha's Institute of Yoga Therapy and Meditation in USA. Worked for pharmaceutical and biotechnology companies in Germany and India.*

### **Journey into Mind - DNA - Consciousness**

Scientists and Spiritual seekers are searching for the “Truth.” Scientists use gadgets to probe deep into the physical matrix of the manifest universe, while Spiritual seekers search for answers from within oneself and use the Human Mind & Body as the laboratory. It is important to appreciate the Science in Spirituality because spiritual growth or Self-Liberation is a scientific process. Despite scientific advancement, the intricate workings of Human brain, mind & consciousness is still a mystery. Epigenetic changes have been attributed to various diseases in the recent past and reversal of these epigenetic changes have also been reported by various scientific studies through relaxation techniques like Meditation. Thus, there is a scientific proof that Stress impacts the DNA negatively, while Meditation impacts the DNA positively. It is also a well-known fact that stress is felt by the MIND before the physical body feels its impact; same goes with Meditation where the relaxation and clarity is first felt by the MIND before positive changes are noticed in the physical wellbeing. This is a clear scientific proof that MIND indeed is in our DNA. Mind is closely associated with our Consciousness and so needless to say that DNA, MIND and CONSCIOUSNESS are in constant communion.

#### ***Talk time + 10 min Q&A:***

US | 12:15 - 12:55 PM

UK | 5:15 - 5:55 PM

IN | 10:45 - 11:25 PM

#### ***Participating in***

***interdisciplinary dialogue:***

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J Scott Turner, PhD  
State University of New York (SUNY)  
Latest book: *Purpose and Desire* (2017)

*Emeritus Professor of Biology at SUNY. Project Director on science-related issues for the National Association of Scholars. Physiologist by training, but with a deep interest in the interface of physiology with evolution, ecology and adaptation. Prolific author of peer-reviewed scientific articles and books.*

### Evolution is Cognitive Thermodynamics

Charles Darwin sought a natural law explanation for the evolution of life, which he hoped would be free of the vitalist predilections of his grandfather, Erasmus Darwin, and his French predecessor, Jean-Baptiste Lamarck. His solution was natural selection: variation of form and function within generations, with some variants being “naturally selected” for success in breeding. Darwin’s conception of natural selection was inextricably bound up with the organism, particularly in the phenomenon of adaptation, for which he constructed an elaborate theory of heritable adaptation, pangenesis. In the 1920s, Darwin’s organism-centered concept of adaptation was replaced by a gene-centered concept, which conferred fitness on genes for “apt” function relative to genes for “inapt” function. As a result, the vital phenomenon of adaptation was lost.

A coherent theory of evolution requires a coherent theory of life, which modern Darwinism lacks. What is needed is an explicit recognition of life’s unique attributes, among them cognition, intentionality, purposefulness, and creativity, but grounded in life as a thermodynamic phenomenon. I argue that recognizing life’s unique properties (“small-v vitalism”) is not only compatible with understanding life as a thermodynamic phenomenon, it provides a more coherent theory of adaptation and evolutionary change. This negates the Darwinian conception of evolution, however, because it makes evolution a profoundly purposeful phenomenon, driven by the intentionality and creativity of life.

#### **Talk time + 10 min Q&A:**

US | 1:05 - 1:45 PM

UK | 6:05 - 6:45 PM

IN | 11:35 PM - 12:15 AM

#### **Participating in**

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Alicia Juarrero, PhD  
University of Miami  
Latest book: *Context Changes Everything* (2023)

*President and co-founder of VectorAnalytica, Inc., and Visiting Scholar at the University of Miami. Ongoing research in neurophilosophy is focused on the causal role of context-sensitive constraints in the emergence of mental events such as intentions.*

### Complexity Theory & Purposiveness

Teleological explanations of natural phenomena rest on a particular understanding of “purposiveness.” Specifically, they rest on an 18 th century European understanding of “intrinsic purpose” as self-organization (Juarrero-Roque 1985). This understanding, as Kant noted, in turn rests on a particular view of causality -- as recursive and capable of subtending ontically real mereological relationships. This entire framework is closed off to modernity’s notion of causes and effects as either (metaphysically) the collision of two independent entities, or (epistemologically) as perceptual correlation between two distinguishable sense perceptions. Lacking real and scientifically respectable notions of emergence and top-down causal relations, philosophy of science generally, and philosophy of mind in particular, have either retreated into epistemological solipsism or proposed a variety of versions of panpsychism. Complex adaptive systems theory, in contrast, conceives of reality as fundamentally dynamic, processual, and based on interactions enabled, constituted, and governed by a variety of constraints (not contradictions). Bottom-up, enabling constraints generate higher-level organizations; top-down, constitutive and governing constraints maintain and preserve the achieved and emergent higher-level organization. They also regulate, modify, and otherwise control those lower-level processes that realize those emergent higher-level organizations.

Such a theory can better illuminate top-down causal relations and therefore purposive or teleological explanations that “look upwards” towards higher-level structures.

#### References:

- Juarrero, A. 2023. *Context Changes Everything: How Constraints Create Coherence*. MIT Press.
- Juarrero, A. 1999. *Dynamics in Action: Intentional Behavior as a Complex System*. MIT Press.
- Juarrero-Roqué, A. 1985, Kant’s concept of teleology and modern chemistry. *Review of Metaphysics* 39:107-135.

#### **Talk time + 10 min Q&A:**

US | 1:55 - 2:35 PM  
UK | 6:55 - 7:35 PM  
IN | 12:25 - 1:05 AM

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2:45 PM ET US / 7:45 PM UK /  
1:15 AM IN



James A Shapiro, PhD

University of Chicago

Latest book: *Evolution: A View from the 21st Century. Fortified* (2022)

*Worked as professor of microbiology at the University of Chicago since 1973. Earlier, while working at Harvard, Shapiro was part of the first team to isolate a single gene from an organism. An expert in bacterial genetics, he proposes the concept of Natural Genetic Engineering, a process described to account for novelty created in the process of biological evolution. Shapiro is an advocate of non-Darwinian evolution and is a critic of the modern synthesis. He has published primary scientific literature on evolution since the early 90s.*

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#### Masters of Ceremonies (MCs):



Sumangala Didi, PhD  
Sri Chaitanya Saraswat  
Institute



Krishna Keshava Das  
Princeton Bhakti  
Vedanta Institute

We welcome all thoughtful  
questions, comments, or concerns  
regarding this conference. Contact:

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