Handbook

Summer School – 2026

THOUGHT EXPERIMENTS

June 05 - 07, 2026 | Venue: IIT (BHU) Varanasi

Imagination is more important than knowledge. For knowledge is limited, whereas imagination embraces the entire world, stimulating progress, giving birth to evolution.

— Albert Einstein
Nobel Laureate in Physics

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Organized by

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Dedicated to

Dr. T. D. Singh

(His Holiness Bhaktisvarupa Damodara Swami)

(1937-2006)

Scientist and Saint

Founder Director, Bhaktivedanta Institute

&

Founder President, Vedanta and Science Educational Research Foundation

Acknowledgements

We are thankful to the mercy of the Supreme Lord and the blessings of our visionary, Dr. T. D. Singh, as well as the tireless efforts of the dedicated team members of Bhaktivedanta Institute, Kolkata and students of IIT (BHU) Varanasi, which have made the 11th Summer School titled "Thought Experiments" possible in the city of Varanasi, India. We extend our heartfelt gratitude to our Honorable Chief Guest, Prof. Amit Patra, Director, IIT (BHU) Varanasi, and Distinguished Guests of Honour - Dr. B. D. Mundhra, Emeritus Chairman of Simplex Infrastructures Limited, Kolkata; Chairman, Bhartiya Vidya Mandir; and Prof. Abhas K. Mitra, Hon. Adjunct Professor, Homi Bhabha National Institute, Mumbai & Former Head, Theoretical Astrophysics Section, Bhabha Atomic Research Centre, India, for graciously accepting our invitation and sharing their profound insights. We also acknowledge the valuable presence of esteemed special guests. We as well express our deep appreciation to all the esteemed speakers for kindly accepting our invitation to share their profound wisdom.

The Summer School is being organized in IIT (BHU) Varanasi campus. We extend our heartfelt gratitude to the administration of IIT (BHU) Varanasi whose unwavering support has been pivotal in making this event possible and ensuring the success of the school. We also sincerely thank all the administrative supports of Banaras Hindu University at various fronts.

We extend our heartfelt thanks to Prof. Prabhat Kumar Singh, Chairman of Summer School 2026, Prof. Debashis Khan, Convenor of the Summer School 2026 and the entire organizing team, including Dr. Roshan Tiwari, Yenugu Nikhil, Ruthvik Galem,

Jagadishwar Dasari, Sravan Velisela, Rajesh Pandit, Sai Vineeth, Dr. Manas Chandra Mishra, Ms Monalisa Yerrolla, Avinash Kumar, Jitun Dhal, Ashini Singh, Tushar Das, Sushant Sharma, Sanjib Saha, Madan Manohar Das, Vedananda, Rakesh, Pratiyush Mishra, Raj Gourav Tripathi, Soumi Bhattacharjee, Nilotpal Dutta, Debjit Dey, and many more. Each of them devoted their time, effort, and enthusiasm to overseeing website design, venue logistics, registration, accommodation, hospitality, outreach, online platform management (Zoom), food service, fundraising, making registration kits, and other essential tasks. We also gratefully acknowledge the good wishes and prayers from friends, well-wishers, and the community of Dr. T. D. Singh's family, whose blessings have been indispensable for this school.

We gratefully acknowledge the immense support from members and volunteers of IIT (BHU) Varanasi, including Satyabrat Pandey, Mudit Mishra, Vatsalya Raghuvanshi, Ashwarya Sheel Wali, Harishankar, Shambhu Patel, Anupam Mishra and many more, for extending their valuable time and providing immense support at various fronts especially managing the event and registrations.

We thank all the participants from across the country for joining the school despite their busy schedules. We also thank the scholars for showing interest in the “Young Mind Speaks” competition and sharing intriguing and novel ideas. We extend our gratitude to presentation review committee members for their continuous support.

We extend heartfelt thanks to several academic institutions like BHU; IIT (BHU) Varanasi; University of Hyderabad, Telangana; Patna Women’s College; B.N. College Patna; Asutosh College, Kolkata; St.

Xavier's College (Autonomous), Kolkata; and Techno Main Salt Lake, Kolkata for their support in encouraging student participation in the Summer School 2026. A special note of thanks to Dr. Amit Chatterjee (Asutosh College), Dr. Ravi Kumar (Patna Women's College) and Dr. Abhishek Kumar Sharma (B. N. College Patna) for their dedicated and selfless support.

We are indebted to the kind donations for the summer school by Prof. Rajesh Kumar, Prof. Sandeep Kumar, Prof. Ramagopal V. S. Uppaluri, Prof. Dheeraj Dube Prakashchand, Prof. Debashis Khan, Prof. Ramjee Repaka, Prof. Pabitra Ranjan Maiti, Prof. P. Bala Ramudu, Prof. Arnab Sarkar, Prof. Hare Krishna Mohanta, Prof. Chandana Rath, Sushant Sharma, Dr. Roshan Tiwari, HH Gambhir Anandapuri Maharaj, Keyur Trivedi, HG Amala Gaura Das Adhikari, Sriman Rajesh Pathak, Jaya Kumar, Rajendiran Natarajan, Naveen Kumar, Vaishak, Bharghav, HG Namasankirtan Swami, Anitha and many other generous benefactors. Sincere thanks to our Special Sponsors Dr. B. D. Mundhra, Emeritus Chairman, Simplex Infrastructures Limited, Kolkata and K. L. Yadav, Ramesh Furniture, Varanasi.

We extend our heartfelt gratitude to Dr. T. D. Singh (H. H. Bhaktisvarupa Damodara Swami), a visionary leader who pioneered the synthesis of science and spirituality and was the founding director of the Bhaktivedanta Institute. His invaluable guidance has been pivotal in the successful organization of this school for the benefit of humanity.

We are also deeply indebted to Srila A. C. Bhaktivedanta Swami Prabhupada, a visionary saint and the founder acharya of the Bhaktivedanta Institute, for establishing this remarkable platform

and vision.

While words may fall short, our gratitude is boundless. We express our sincere thanks to everyone involved, named and unnamed, from the core of our hearts.

May positivity and goodwill flow from all directions. May happiness be with everyone.

Sarve jana sukhino bhavantu!

In the service of the Supreme Lord and your good self,

Vasudeva Rao
President, Bhaktivedanta Institute
(Alumnus, IIT Kanpur)

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Welcome Address

Esteemed participants of the Summer School on Thought Experiments,

It is an absolute honor to welcome you today to the prestigious cradle of learning, IIT (BHU) Varanasi, a place where modern technological excellence seamlessly meets the eternal, spiritual heritage of the sacred city of Kashi. On behalf of the Bhaktivedanta Institute, Kolkata, I extend my profound gratitude to the Director, IIT (BHU) Varanasi, for providing us with the venue and to our co-organizers, dignitaries, and participants who have gathered here from across the country and beyond.

We also offer our deepest respects to the legacy of Mahamana Pandit Madan Mohan Malaviya ji, and our foundational inspirations, His Divine Grace A. C. Bhaktivedanta Swami Prabhupada and Dr. T. D. Singh (His Holiness Bhaktisvarupa Damodara Swami). Their visionary emphasis on synthesizing science and spirituality is the very life force behind this three-day gathering.

The central theme of our Summer School this year revolves around a fascinating tool that sits at the very frontier of human inquiry: **Thought Experiments.**

When our physical instruments reach their limits, when our laboratories cannot yet recreate the extreme conditions of the cosmos or the microscopic realities of the quantum world, the human mind steps in as the ultimate laboratory. From Galileo dropping weights from the Leaning Tower of Pisa in his mind, to

Newton's bucket, and from Einstein chasing a beam of light to formulate Special Relativity, to Schrödinger's famously elusive cat, science has historically progressed not just through empirical data, but through the deep, structured conceptual frameworks born within the laboratory of the human mind. Thought experiments allow us to strip away engineering limitations and explore the logical limits of physical laws.

Yet, as we gather in 2026 to discuss the limits of objective reality, quantum mechanics, and artificial intelligence, we find ourselves hitting a formidable wall: **consciousness**.

The Missing Link in the Science of Consciousness

We live in an era captivated by computation, neural networks, and the drive toward Artificial General Intelligence. But as we attempt to map the brain, a fundamental question remains unanswered: *How does a collection of objective, physical molecules give rise to subjective, lived experience? Why do we feel, perceive, and experience awareness?*

The current materialistic paradigm treats consciousness as an "emergent property" of matter, a byproduct of biochemical reactions. However, this approach leaves us with what philosophers call the "Hard Problem of Consciousness."

To break this impasse, our thought experiments must expand. We cannot solve the problem of the observer using a science that systematically excludes the observer. We need a rigorous, systematic framework that treats consciousness not as an accidental footnote of the universe, but as a fundamental, irreducible reality.

Bridging with Indian Knowledge Systems (IKS)

This is precisely where the rich, sophisticated repository of **Indian Knowledge Systems (IKS)** offers an invaluable compass. For millennia, the seers and philosophers of this land did not merely speculate; they developed highly rigorous, empirical, and internal methodologies to map the human mind, intellect, and the self.

In Western philosophy, thought experiments are often treated as hypothetical scenarios to test logical consistency. In contrast, the Vedic and Vedantic traditions of India utilized thought experiments as **transformative, experiential tools (Sadhana)** to shift one's state of awareness and directly discern reality.

Thought experiments for consciousness are unique. Classical thought experiments are conceived in the inner world and tested in the outer world. However, thought experiments on consciousness are both conceived and tested in the inner world. This is how IKS models of consciousness have been developed, tested, and accepted since ancient times. Consider these profound conceptual frameworks from IKS that can revolutionize a modern science of consciousness:

- **The Sankhya System of Dualism:** Long before modern cognitive science, Sage Kapila's *Sankhya* philosophy proposed a brilliant cosmological and psychological framework. It splits reality into two irreducible, independent principles: **Prakriti** (the entire objective universe, including matter, energy, the physical brain, and even the subconscious mind) and **Purusha** (pure, uncaused consciousness, or the observer). *Sankhya* presents a highly logical thought experiment: it demonstrates that mind and matter are both objective (*Drishya*), while the

true self is the silent, conscious witness (*Drasta*). This cleanly isolates the "Hard Problem" by showing that matter cannot produce consciousness because they belong to two entirely different categories of existence.

- **The Pancha-Kosha Model (The Five Sheaths):** Outlined in the *Taittiriya Upanishad*, this is an incredible analytical thought experiment regarding human identity. It systematically peels away layers of reality—from the gross physical body (*Annamaya*), to vital energy (*Pranamaya*), the mental faculty (Manomaya), the intellectual discernment (*Vijnanamaya*), and finally to the core of pure, unadulterated consciousness and bliss (*Anandamaya*). It challenges us to ask: *Who is the ultimate "I" that witnesses these layers?*

- **The Drig-Drishya Viveka (The Distinction Between Seer and Seen):** This classical text uses a brilliant, logical thought experiment to isolate consciousness. It posits that the object of perception is always distinct from the perceiver. The eye sees the object, but the mind "sees" the eye. The intellect observes the mind, but what observes the intellect? By following this chain of observation to its logical end, we arrive at the *Drasta*—the ultimate, non-material Seer or Witness Consciousness (*Sakshi*).

- **The Three States of Awareness (Avastha-Traya):** The *Mandukya Upanishad* conducts a profound inquiry into the waking (*Jagrat*), dreaming (*Svapna*), and deep sleep (*Susupti*) states. It demonstrates that while the objects of our thoughts and dreams constantly change and vanish, the underlying screen of awareness remains continuous.

By integrating these IKS frameworks, our contemporary thought experiments can move beyond mere mathematical abstraction. They allow us to build a structured, verifiable science of the subjective world, establishing consciousness as a primordial element of reality, much like space, time, or mass.

Conclusion & Call to Action

My dear friends, researchers, and esteemed scholars, over the next three days, we will listen to thought-provoking sessions ranging from higher-dimensional mathematics to quantum mechanics, and from chemical engineering to the philosophy of mind.

I urge you to approach these sessions with an open, critical, and integrative mind. Do not view ancient Indian insights as relic-worship, nor modern science as mere materialism. Rather, let us look at them as two complementary eyes through which humanity can finally behold the complete truth of existence.

May this Summer School inspire your minds, spark brilliant dialogues, and plant the seeds for a holistic, inclusive science of the future.

Once again, I welcome you all to this grand intellectual feast in the holy city of Varanasi.

Thank you for joining us.

Vasudeva Rao
President, Bhaktivedanta Institute
(Alumnus, IIT Kanpur)

Introduction

Thought experiments have long served as profound instruments for creativity, intellectual exploration, and the advancement of knowledge across science, philosophy, and spirituality. From Faraday's visionary concept of lines of force, which later evolved into the modern understanding of fields, to the celebrated paradoxes of quantum mechanics such as Schrödinger's Cat, thought experiments have played a central role in shaping modern scientific inquiry. They enable us to venture into realms where direct physical experimentation is impossible, offering rigorous frameworks for discovery, theory evaluation, and the examination of the very boundaries of scientific laws. Beyond the reach of empirical observation and technological instrumentation, thought experiments allow the human mind to explore deeper dimensions of reality and contemplate questions that transcend conventional methods of investigation. At the same time, they serve as powerful tools for clarifying misconceptions, resolving paradoxes, and illuminating hidden aspects of life and the universe. By expanding the horizon of imagination and reason, thought experiments continue to inspire humanity's quest for truth, meaning, and a deeper understanding of existence itself.

Through intensive presentations, dialogues, and discussions, Summer School 2026 seeks to explore the transformative power of thought experiments in addressing some of the deepest questions of existence. The program will examine enduring debates on mind and matter, the irreducibility of life, the existence of God, and the meaning and purpose of the universe. It will also investigate the

possibility that reality may encompass laws beyond those currently known to physics, including deeper psychological and metaphysical dimensions. By encouraging participants to develop new and imaginative thought experiments, the summer school aims not only to advance intellectual inquiry, but also to inspire personal transformation through qualities such as humility, gratitude, compassion, forgiveness, and care for humanity and the planet.

Thus, the Summer School 2026 on “Thought Experiments” aims to delve into the above profound inquiries, offering a unique platform for interdisciplinary exploration and intellectual growth. Joining this summer school would be an exciting opportunity as it will offer to ponder over the numerous thought-provoking as well as pertinent concepts as mentioned above. A number of stimulating lectures would be delivered by distinguished professors and scholars from premier institutes of the country and abroad to summarize the historical developments of Thought Experiments over years, unbelievable capabilities of Thought Experiments to resolve the foundational issues in science and philosophy and to mention about future roadmap possible for next level of developments. The school would also be promising to develop priceless interactions with the researchers for an extended period of time.

The school will be held in Varanasi often referred to as India's knowledge capital, has a rich history of scholarly pursuits and artistic expression. It is the birthplace of modern Indian literary and artistic thought, and a hub for preserving Indian culture. The city's blend of Eastern and Western influences has fostered numerous organizations contributing to intellectual pursuits and cultural life.

By merging contemporary scientific knowledge with traditional Indian wisdom, the summer school seeks to offer a comprehensive and enlightening educational experience. Participants will have the opportunity to engage with leading researchers, fostering interdisciplinary collaboration and innovative thinking. This approach is especially pertinent in an era where interdisciplinary knowledge is key to breakthroughs in technology and science.

We hope the school will inspire new perspectives, stimulate intellectual curiosity, and contribute to a deeper understanding of the pivotal role of Thought Experiments in shaping our life. Best wishes for your journey of discovery at the Summer School 2026.

Prof. Debashis Khan
Department of Mechanical Engineering,
IIT (BHU) Varanasi
&
Convener
Summer School – 2026

Schedule

Day 1: June 05, 2026 (Friday)

08:00 am – 09:15 am	Registration and Breakfast
09:15 am – 10:30 am	**Opening Ceremony & Welcome Address**
10:30 am – 11:00 am	Break
Session 1	
11:00 am – 11:45 am	**Thought Experiments in Science and Spirituality: A Brief Overview** Varun Agarwal, *Director, Bhaktivedanta Institute, Kolkata, Alumnus, IIT Kanpur*
11:45 am – 12:00 pm	Q & A
12:00 pm – 12:45 pm	**Curvature: Concept, and Its Overtones** Prof. C. S. Aravinda, *Tata Institute of Fundamental Research, Bangalore*
12:45 pm - 01:00 pm	Q & A
01:00 pm – 02:00 pm	Lunch and Break
Session 2	
02:00 pm – 02:45 pm	**Role of Critical Thinking in the Progress of Physics** Prof. Abhas K. Mitra, *Hon. Adjunct Professor, Homi Bhabha National Institute, Mumbai, India & Former Head, Theoretical Astrophysics Section, Bhabha Atomic Research Centre*

02:45 pm – 03:00 pm	Q & A
03:00 pm – 03:45 pm	**Bridging Higher-Dimensional Mathematics and Vedantic Thought** Prof. Sandeep Kumar, Department of Mechanical Engineering, *IIT (BHU) Varanasi*
03:45 pm – 04:00 pm	Q & A
04:00 pm – 04:45 pm	**A Thought-Experiment and Experiential Approach to Discerning Consciousness and Its Counterfeit** Dr. Jaynarayan T. Tudu, *Department of Computer Science, IIT Tirupati*
04:45 pm – 04:50 pm	Q & A
04:50 pm – 05:20 pm	Break
Session 3	
05:20 pm – 06:05 pm	**The Limits of Objective Reality** Prof. Renato Renner, *Department of Physics, ETH, Zurich (Online)*
06:05 pm – 06:20 pm	Q & A
06:20 pm – 07:05 pm	**What Do We See in a Thought Experiment?** Prof. James Robert Brown, *Department of Philosophy, University of Toronto, Canada (Online)*
07:05 pm – 07:20 pm	Q & A
07:20 pm – 08:15 pm	Visit to Campus New Vishwanath Temple
08:15 pm – 09:30 pm	Dinner

Day 2: June 06, 2026 (Saturday)

08:00 am – 09:00 am	Breakfast
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09:45 am – 09:50 am	Q & A
09:50 am – 10:35 am	**Consciousness Beyond DNA: Insights from Twins and Human Cloning** Dr. Srikanth Chandragiri, *Helmholtz Research Centre, Munich, Germany*
10:35 am – 10:40 am	Q & A
10:40 am – 11:25 am	**The Sealed Universe Laboratory: A Thought Experiment on Exogenous Variables, Causality and Conscious Choice** Dr. Roshan Tiwari, *Research Scientist, Bhaktivedanta Institute, Kolkata*
11:25 am – 11:30 am	Q & A
11:30 am – 11:50 am	Break
11:50 am – 12:35 pm	**Computation and Awareness** Sushant Sharma, *Bhaktivedanta Institute, Kolkata; Alumnus, IIT Guwahati*
12:35 pm – 12:40 pm	Q & A
12:40 pm – 01:25 pm	**Can Simulation Be Experience? A Computational Thought Experiment on Consciousness** Prabhakar Ballapalle, *Sandisk, Bengaluru*

01:25 pm – 01:30 pm	Q & A
01:30 pm – 02:30 pm	Lunch and Break
Session 2	
02:30 pm – 03:15 pm	**Thought Experiments in Chemical Engineering** Prof. Ramagopal Uppaluri, *Department of Chemical Engineering, IIT Guwahati*
03:15 pm – 03:20 pm	Q & A
03:20 pm – 04:05 pm	**Thoughts on Chemical Origin of Life Research: Trends from a Computational Perspective** Dr. Sai Phani Kumar Vangala, *Department of Chemical Engineering, IISER, Bhopal*
04:05 pm – 04:10 pm	Q & A
04:10 pm – 04:30 pm	Break
Session 3	
04:30 pm – 05:15 pm	**Portals to A New Reality: Five Experiments to Unlock the Future of Physics** Prof. Vlatko Vedral, *Department of Physics, University of Oxford*
05:15 pm – 05:30 pm	Q & A
05:30 pm – 08:30 pm	Summer School Tour: Serene Boat Ride on the Sacred Ganges
08:30 pm – 09:45 pm	Dinner

Day 3: June 07, 2026 (Sunday)

08:00 am – 09:00 am	Breakfast
Session 1	
09:00 am – 09:45 am	**Reimagining the Observer: Indian Knowledge Systems as Frameworks for Modern Thought Experiments in Consciousness** Vasudeva Rao, *President, Bhaktivedanta Institute, Kolkata; Alumnus, IIT Kanpur*
09:45 am – 10:00 am	Q & A
10:00 am – 10:45 am	**Multilingualism, Self, and Consciousness: Towards a Theory of Diversity-Induced Modulation of Self** Prof. Ramesh Kumar Mishra, *Centre for Neural and Cognitive Sciences, University of Hyderabad*
10:45 am – 11:00 am	Q & A
11:00 am – 11:45 am	**Thought Experiments and Molecular Reality: From In Vivo Observation to In Silico Exploration** Dr. Dube Dheeraj *Prakashchand, Centre for Human Computer Interaction, IIT Mandi*
11:45 am – 11:50 am	Q & A
11:50 am – 12:10 pm	Break
Session 2: Young Mind Speaks	
12:10 pm – 01:15 pm	**A Thought Experiment on the Origin of Universe** Abhiman Udayakumar Shetty, *B. Tech. IIT Bhubaneswar*

12:10 pm – 01:15 pm	**The Quantum Librarian: Bridging the Measurement Problem and Ancient Wisdom** Ruthvik Galem, *Research Scholar, Bhaktivedanta Institute, Kolkata; Alumnus, IIT Bhubaneswar*
	Wigner's Friend and Observer Dependent Descriptions Akash Pujari, *IIT Madras*
	Artificial Brain & Conscious Experience Jagadishwar Dasari, *Technical Lead, Bhaktivedanta Institute, Kolkata; Alumnus, IIT Gandhinagar*
	Mind as a Laboratory Y Monalisa, *B. Tech. IIT Bhubaneswar*
	The Observer's Dilemma: Human Consciousness vs. Statistical Models Rajesh Pandit, *Quality Analyst, Learningmat; Alumnus, IISER Kolkata*
	Transparent Mind Network: Consciousness beyond Computation Naramshetti Padmaja, *Vivaram Hemanth Kumar, Haridasu Akhileshwari, Goda Mohan Krishna, B. Tech. RGUKT Nuzvid*
01:30 pm – 02:30 pm	**Lunch and Break**
02:30 pm – 03:15 pm	Panel Discussion
03:15 pm – 04:00 pm	**Valedictory Session**
04:00 pm – 08:00 pm	Summer School Tour: Shree Kashi Vishwanath Darshan
08:00 pm – 09:00 pm	Dinner

Abstracts & Bio-datas of Speakers

Day 1: 05 June 2026 (Friday)
Session 1

1.1. Thought Experiments in Science and Spirituality: A Brief Overview

Varun Agarwal, *Director, Bhaktivedanta Institute, Kolkata; Alumnus, IIT Kanpur*

Thought experiments have been an important part of scientific development. They help us to question our own theories, and thus contributing to progress further. They push us to challenge our own conceptions of reality and contemplate deeper about life and universe we live in. Many scholars, past and present, in various disciplines of science, philosophy, psychology and spirituality, have proposed wonderful thought experiments to explore the nature of consciousness, nature of space and time around us, and even on how to be a better person.

The current presentation will categorise thought experiments with examples. In addition, the author will attempt to propose a few novel thought experiments and also present a few glimpses from the ancient Vedantic wisdom. Mental laboratories, which scientists as well as spiritualists use to explore reality, can thus serve as a beautiful common ground for both. The presentation ends with a proposal for the synthesis of science and spirituality in our search for reality.

Varun Agarwal (also known as His Holiness Bhaktisvarupa Vrajendrakumar Swami) graduated from the prestigious Indian Institute of Technology Kanpur (IIT Kanpur), India obtaining his B.Tech in Aerospace Engineering (1999). He worked on a project of solar-powered aircraft and was ranked first in his entire department. However, his longing for something deeper about life which always bothered him finally culminated in meeting the illustrious scientist-saint Dr. T. D. Singh (His Holiness Bhaktisvarupa Damodara Swami), the Founder Director of the Bhaktivedanta Institute.

Under his guidance, he began studying ancient Vedantic wisdom, dedicating himself completely for the cause of helping humanity through the interface of scientific temper and spiritual wisdom. He is currently serving as the Director of the Bhaktivedanta Institute, Kolkata, India. Besides his various involvements, he frequently travels across India & abroad and interacts with scientists and scholars all over the world including world-renowned universities of Harvard, Princeton, ETH and Stanford to MIT. He is also the Editor of Bhaktivedanta Institute's reputed science and spirituality journal, Savijnanam.

1.2. Curvature: Concept, and Its Overtones

Prof. C. S. Aravinda, *Tata Institute of Fundamental Research, Bengaluru, India*

In this elementary talk, we explore the notion of curvature used in rigorous mathematical discipline through its more accessible discrete version that effectively conveys the concept's smooth transition from intuition to rigour. All through the talk, the emphasis will be on capturing the essence of this notion from a historical perspective, through certain overtones drawn from nature, literature and through illuminating pictures. The underlying thought process is both to gain an informed

understanding of this most important notion in relatable dimensions 1 and 2, and to discern how brilliantly nature sorts out some of the subtle notions involved, with remarkable clarity and innate beauty.

Prof. C. S. Aravinda is an Indian mathematician and a faculty member at the TIFR Centre for Applicable Mathematics, Bengaluru, a leading research institute under the Tata Institute of Fundamental Research. His work lies at the intersection of geometry, topology, and dynamical systems, with a particular focus on the structure and behavior of manifolds. He completed his M.Sc. in Mathematics from Central College, Bangalore University in 1985. He went on to pursue his Ph.D. in Mathematics at the Tata Institute of Fundamental Research, University of Bombay, which he completed in 1995. Dr. Aravinda began his academic career as a Research Associate at the Indian Statistical Institute (1995–1997). He then joined the Chennai Mathematical Institute, where he served as a Fellow (1997–2002) and later as a Reader (2002–2007). In 2007, he moved to TIFR's Centre for Applicable Mathematics as a Reader (2007–2010), and has been serving as an Associate Professor since 2011. He has also held notable international visiting positions, including as a Visiting Mathematician at the International Centre for Theoretical Physics (1991–1992) and as a Visiting Associate Professor at the State University of New York at Binghamton (2000–2002).

His research interests broadly span Riemannian geometry, ergodic theory, and topology. He is particularly interested in the study of manifolds of nonpositive curvature, exploring their geometric, dynamical, and topological properties. His work contributes to a deeper understanding of the interplay between geometry and dynamics in mathematical structures. Beyond research, he has played an important role in the mathematical community in India. He has been actively involved in academic activities such as organizing instructional schools and workshops, including

programs in algebraic topology, and contributing to editorial and scholarly initiatives. He has served on editorial boards of mathematical publications and is associated with Bhāvanā, a mathematics magazine, where he has also served as Chief Editor.

Session 2

2.1. Role of Critical Thinking in the Progress of Physics

Prof. Abhas K. Mitra, *Hon. Adjunct Professor, Homi Bhabha National Institute, Mumbai; Former Head, Theoretical Astrophysics Section, Bhabha Atomic Research Centre, India*

Physics is about understanding the secrets of the physical world by means of physical experiences, observations and experimentations. However, at any given epoch, there are limitations on the actual experimentations and even most advanced experiments may not always lead to expected results. For instance, over the past 60 years cosmologists have believed that most of the matter content of the universe is different from ordinary matter composed of electrons, protons and neutrons. Such hypothesized matter is called "Dark Matter" as it eludes any direct electromagnetic detection. But despite most advanced global scale experimentations over past 30 years, no dark matter has been detected.

And indeed, physics has occasionally taken big leaps by means of thought experiments in lieu of actual experiments. The key element behind thought experiments is the power of original thinking. However, this speaker is not an experimental physicist. And having discussed few of the well-known thought experiments, this speaker will have the liberty of deviating to the topic of critical thinking related to his own research. For instance, when the entire world thought that Ultra-High Energy (UHE) cosmic gamma rays,

supposedly detected from the famous X-ray binary Cygnus X-3 must be due to Proton + Proton → Neutral Pion → Gamma Rays, this speaker proposed a different mechanism: proton + X-ray photon → Pion → Gamma rays.

When almost all astrophysicists believe that the so-called astrophysical Black Holes are vacuum mathematical black holes except for a singular point, the present speaker felt that existence of true black holes may violate a basic pillar of Einstein's General Relativity, and hence the so-called black holes are likely to be non-singular ultra-dense balls of plasma.

Since 1991, cosmologists believe that most of the energy component of the universe is not derived from the mass-energy of ordinary matter and dark matter, but a mysterious repulsive energy called Dark Energy. However, there has not been any direct confirmation or detection of this mysterious dark energy in 45 years. And 15 years ago, from purely theoretical consistency considerations, this author argued that Dark Energy may not be real, and, on the other hand, an artifact of explaining a highly complex inhomogeneous and lumpy universe with an over-simplified model.

Prof. Abhas K. Mitra is a distinguished Indian astrophysicist and former Head of the Theoretical Physics Section at the Bhabha Atomic Research Centre (BARC), Mumbai. He is currently serving as an Honorary Adjunct Professor at the Homi Bhabha National Institute and is an alumnus of the University of Mumbai. He is widely recognized for his contributions to astrophysics, general relativity, and the foundations of gravitational theory, with a particular emphasis on compact objects and black holes. Dr. Mitra began his scientific career as an observational gamma-ray astronomer in Kashmir, where he initiated pioneering research on high-energy astrophysical phenomena. He subsequently played a key role in advancing the study of cosmic gamma-ray bursts in

India. In later years, his research transitioned toward theoretical astrophysics, focusing on general relativistic gravitational collapse and cosmology. His work critically examines fundamental issues related to event horizons, singularities, and the physical interpretation of black holes. Notably, his ideas on black holes attracted international attention, including mention in a press release associated with Harvard-based research groups.

Prof. Mitra is also associated with a long-standing cosmological puzzle known as the "Mitra Paradox," reflecting his deep engagement with unresolved questions in gravitational physics. His research often explores conceptual and foundational aspects of relativity, contributing to ongoing debates about the limits and interpretation of gravitational theory. In addition to his academic contributions, Prof. Mitra is an engaging science communicator. He has delivered multiple TEDx talks on theoretical physics and numerous public lectures at premier institutions such as IIT Bombay, IIT Kharagpur, and VJTI, inspiring a broad audience with his insights into the nature of the universe.

2.2. Bridging Higher-Dimensional Mathematics and Vedantic Thought

Prof. Sandeep Kumar, *Department of Mechanical Engineering, IIT (BHU) Varanasi, India*

The functioning of the Universe is inherently complex, yet it is often interpreted through simplified conceptual and mathematical models. For any such model to be meaningful, it must be grounded in logical consistency and explanatory coherence. Human beings, in their pursuit of understanding and progress, similarly rely on conceptual frameworks or "models" for guidance in life. Religious and philosophical traditions, including various interpretations of Dharma, have historically offered comprehensive models to explain the nature and origin of the Universe.

A model that closely approximates the structure and behaviour of the real Universe holds significant value, both scientifically and philosophically. While initial understanding is often built upon simplified representations, continuous refinement toward greater accuracy remains essential. Across disciplines, both theistic and non-theistic perspectives have proposed logical and mathematical frameworks to explain cosmic creation and structure. In particular, axiomatic approaches to fields and space—especially in higher-dimensional contexts—offer promising avenues for theoretical exploration, even when direct experimental verification is not feasible.

This presentation explores potential parallels between the philosophical insights of Vedanta and modern mathematical concepts related to higher-dimensional spaces. By examining these intersections, the work aims to contribute to the ongoing effort to develop a more comprehensive and logically consistent model of the Universe that bridges abstract mathematics and philosophical inquiry.

Prof. Sandeep Kumar is a Professor, Department of Mechanical Engineering, IIT (BHU), Varanasi. He graduated from MNREC, Allahabad and completed post-graduation from BHU, Varanasi. His field of interest is Computational Mechanics. After completing a Ph.D. from IIT Delhi in the field of composite plates and shells, he has worked in various fields of research such as meshless methods, chaos theory, and wavelets, etc. Before joining IIT (BHU), he worked in REC Kurukshetra, BITS Pilani and AIMST, Malaysia. He has completed several research projects for DST and BARC. He has numerous publications in international journals of repute. He has authored a popular book, "Mathematical Theory of Subdivisions – Finite Elements and Wavelet Methods", which is published by CRC Press.

2.3. A Thought-Experiment and Experiential Approach to Discerning Consciousness and Its Counterfeit

Dr. Jaynarayan T. Tudu, *Department of Computer Science and Engineering, IIT Tirupati, India*

We will present a set of thought experiments to address what may be called as the not-so-hard problem of consciousness. While the classical hard problem of consciousness concerns the subjective nature of experience, the not-so-hard problem concerns the difficulty of differentiating genuine consciousness from its artificial or counterfeit appearance.

With the rapid progress of artificial intelligence, the human ability to discern real consciousness from its imitation is becoming increasingly blurred. Modern AI systems, many of which are inspired by brain-like models, have become powerful in generating intelligent responses, solving complex tasks, and outperforming humans in several well-defined domains. However, such intelligence is largely confined to domains where sufficient training data is available in describable and computable forms. Alan Turing, in his 1950 paper Computing Machinery and Intelligence, proposed the famous imitation game to examine the question of machine intelligence through a query-response framework. Even today, Turing-like tests remain relevant for comparing advanced AI systems with expert human beings. However, the increasing sophistication of AI systems raises a deeper concern: whether a sufficiently intelligent machine may appear to exhibit conscious phenomena under certain constraints.

In this work, we formulate this observation as the not-so-hard problem of consciousness: how can one distinguish genuine consciousness from counterfeit consciousness? We address this question through a set of thought experiments designed using the

principles of Vedantic spiritual wisdom, with the aim of developing a framework to discern between the reality of consciousness and its artificial imitation.

Dr. Jaynarayan Tudu is currently working as an Assistant Professor at IIT Tirupati in the Department of Computer Science and Engineering. He primarily contributes in the area of AI Hardware Design and Reliability. He has been working on the synthesis of science and spirituality in collaboration with the Bhaktivedanta Institute for quite some time. In this area, he contributes as a researcher, as an organiser of conferences, editor of publications, and as a speaker. He received an MS and a PhD from the Indian Institute of Science, Bangalore, in 2011 and 2016, respectively.

Session 3

3.1. The Limits of Objective Reality

Prof. Renato Renner, *Department of Physics, ETH Zürich, Switzerland*

A famous thought experiment from quantum foundations, known as the Wigner's Friend paradox, exemplifies a tension between the perspectives of two different observers of the same quantum experiment: an internal observer (the Friend), who measures a system while enclosed in an isolated laboratory, and an external observer (Wigner), who models the entire laboratory, including the Friend, as a closed system evolving reversibly.

I present an extended version of this thought experiment and explain how it leads to a no-go theorem, showing that the perspectives of different observers (such as the Friend and Wigner) cannot always be consistently combined into a single objective description of what is "real". I then argue that this insight from

quantum foundations suggests a new way to resolve puzzles in quantum gravity, including the Black Hole Firewall Paradox.

Prof. Renato Renner is a leading theoretical physicist and Full Professor at the Department of Physics at ETH Zūrich, where he heads the Institute for Theoretical Physics and the Quantum Information Theory group. His research lies at the interface of quantum information theory, the foundations of quantum mechanics, and quantum thermodynamics, with a particular focus on understanding how the laws of physics govern the processing and transmission of information. Prof. Renner is widely recognized for his foundational contributions to quantum cryptography, especially the rigorous security framework of quantum key distribution, developed in his doctoral work at ETH Zūrich. His work has helped shape modern approaches to information-theoretic security and has deepened our conceptual understanding of quantum theory.

A central theme of his research explores how thought experiments can probe the limits of quantum mechanics, including its applicability to observers themselves. His work on paradoxes such as the Frauchiger–Renner scenario has sparked important discussions about consistency, measurement, and the role of observers in quantum theory. After completing his PhD, he held a research position at the University of Cambridge before joining ETH Zūrich, where he has been a professor since 2007 and full professor since 2015. Prof. Renner's work continues to bridge conceptual foundations and practical applications, inspiring new directions in both fundamental physics and emerging quantum technologies.

3.2. What Do We See in a Thought Experiment?

Prof. James Robert Brown, *Department of Philosophy, University of Toronto, Canada*

What do we see in a thought experiment? The question is disarmingly simple but quickly becomes perplexing when we try to give an answer. The analogous question for real experiments is easy: We see objects and processes such as: streaks in a cloud chamber, the height of a column of mercury, the changing colour in a chemical reaction, and so on. Even acknowledging the theory-ladeness of observation, the objects of perception in a real experiment are unproblematic. We might be tempted to say the same about thought experiments, given that they are so similar to real experiments. In both we set things up, let them run, then we see what happens, and we finish by drawing a few morals. The only difference it would seem is that a thought experiment is done in the imagination. The right answer is vastly more complicated. And even though thought experiments are a common tool for philosophers and physicists alike, we still do not fully understand them or how they work.

Prof. James R. Brown is Emeritus Professor at the University of Toronto (St. George campus), Canada, and a distinguished philosopher of science known for his influential work in the philosophy of science, philosophy of mathematics, and the study of thought experiments. He completed his BA and MA at the University of Guelph and earned his PhD from the University of Western Ontario. Over his career, he has also been affiliated with the Institute for the History and Philosophy of Science and Technology, contributing to interdisciplinary research at the intersection of science, philosophy, and society. Prof. Brown's research explores mathematics, the nature of scientific reasoning,

and the social dimensions of science, with a particular focus on how thought experiments can generate genuine knowledge about the physical world. His work has been central to debates on whether such experiments provide a priori insights into nature, especially in physics and mathematics.

He is the author and editor of numerous influential works, including The Rational and the Social, The Laboratory of the Mind, Smoke and Mirrors, Philosophy of Mathematics, and Who Rules in Science?, among others. His book The Laboratory of the Mind is widely regarded as a foundational text on the epistemology of thought experiments. In recognition of his scholarly contributions, Prof. Brown has been elected Fellow of the Royal Society of Canada (2007), Fellow of the Leopoldina Nationale Akademie der Wissenschaften, Germany (2004), and Fellow of the Acadīmie Internationale de Philosophie des Sciences, Belgium (2010). Prof. Brown's work continues to shape contemporary discussions on scientific understanding, mathematical knowledge, and the role of imagination in science, making him a leading figure in the philosophical exploration of thought experiments.

Day 2: 06 June 2026 (Saturday)

Session 1

1.1. The Architecture and the Design of Thought Experiment

Prof. A. K. Mukhopadhyay, *Former Professor*, *AIIMS*, *New Delhi*, *India*

With the rise of post-materialistic science, the 'Thought Experiment' is becoming a handy tool for scientists. My approach to the subject for this seminar is linguistic. The subject matter has two components: Thought and Experiment. The Architecture of

thought is multidisciplinary, interdisciplinary and transdisciplinary. It involves the disciplines of Information science, Neurology, Psychology, Cognitive science, and Spatial or Cosmological science. Cosmology bestows it with openness. Designing the experiment with Thoughts is based, as convention, on very specific research questions, a one-sentence tight research hypothesis, a well-articulated aim, with clear objectives of the experiment. Methodology is subjective, and the verification is done by intersubjective concurrence. The only material used in the experiment is a well-formulated 'Thought', which is a very powerful dynamic entity. The only equipment used in this experiment is an evolved human brain with dual characteristics, Openness and Integrity. The openness of the brain is required to different depths of nature, namely, classical nest, quantum nest, subquantum nest, sub-subquantum nest of nature, and finally to unconditional consciousness. The brain requires multilevel integrity, namely, classical integrity, quantum integrity, phenomenological integrity, and integrity for conduciveness to the nascent nature or Mother Nature. It is such a conducive brain, which makes the Unknown imagined, Imagined intelligible, Intelligible possible, Possible verifiable, and the Verifiable verified. The brain is thus the transmissive chokepoint, condensing the Infinity into verified. Thought experiment, thus, is sporting. Like sports persons, the experiment needs to be designed with the spirit of 'Fitness' (determined by ethics) and 'Form' (Aesthetics), ensuring lean management with Ockham's razor. Setting the 'Standard' and using appropriate 'Control', Quality Assurance in the Thought Experiment ensures reliable report cards.

Prof. A. K. Mukhopadhyay, MBBS from University of Calcutta (1977), MD in Pathology from All India Institute of Medical Sciences (1981) joined as Faculty of AIIMS in 1985. Since 2006, he has been the Head of the Department of Laboratory Medicine at AIIMS, New Delhi.

Besides being a reputed laboratory physician and popular teacher in Laboratory Medicine, his special areas of expertise are neuro degenerative disorders like Parkinson's disease, Alzheimer disease, Vascular dementia and neuro psychiatric disorders like Depression and Stress, which have yielded several internationally recognized publications.

His abstract thinking, hypothesis-generation ability and several propositions connecting Consciousness and Mind with Molecular Medicine have made him internationally recognized in the field of Consciousness Study. He coined the term and concept of supracortical consciousness in 1985 and developed further this idea integrating Science, Humanity and Spirit. His keen desire to develop a Science for Consciousness has given birth to four worthy documents. (i) Frontiers of Research for Human Biologists (1985), (ii) The Dynamic Web of Supracortical Consciousness (1987), (iii) Conquering the Brain (1995) and (iv) The Millennium Bridge (2000). His theoretical research extends within Systems Science from signal to information and from Information to knowledge and wisdom. Systems Psyche and the hierarchically structured decision-making labyrinth of consciousness are his recent favorites (www.akmukhopadhyayconsciousness.com).

1.2. Consciousness Beyond DNA: Insights from Twins and Human Cloning

Dr. Srikanth Chandragiri, *Helmholtz Research Centre, Munich, Germany*

Advances in genetics and neuroscience have illuminated the molecular basis of development, cognition, and behavior, yet the fundamental nature of consciousness remains unresolved. Subjective first-person awareness and the lived experience of being a self, continues to resist reduction to purely physical mechanisms. Monozygotic twins provide a striking case study: despite identical

genomes, they develop distinct personalities, preferences, and independent streams of conscious experience. Genetic identity alone therefore appears insufficient to explain individuality at the level of subjective awareness.

Cloning further sharpens this question. A genetically identical clone may reproduce the biological structure of an organism, but it does not inherit the donor's conscious identity, memories, or subjective continuity. This distinction between biological replication and experiential individuality raises a central issue: can consciousness be copied in the same way as DNA, or does it represent a principle irreducible to physical structure?

This presentation examines evidence from twin studies, epigenetics, developmental neuroscience, and cloning biology to probe the limits of current scientific understandings. Epigenetic divergence, environmental variation, stochastic neural development, and nonlinear plasticity explain many differences among genetically identical individuals. Yet these mechanisms do not resolve why physically similar brains correspond to distinct centers of subjective experience. The persistence of experiential individuality underscores an explanatory gap between neural correlates of consciousness and consciousness itself.

Engaging contemporary debates in philosophy of mind — including the "hard problem" of consciousness, emergence theories, and Integrated Information Theory — the discussion considers thought experiments involving perfect genetic or neural duplication. These challenge the assumption that consciousness can be replicated like biological information. Drawing from both scientific discourse and Vedantic philosophy, this work proposes that DNA and neural systems serve as interfaces for consciousness rather than its ultimate source. Twins and clones thus become critical models for exploring whether individuality and conscious identity transcend material explanation.

Dr. Srikanth Chandragiri is currently affiliated with the Institute for Diabetes and Obesity at Helmholtz Munich (Helmholtz Zentrum Mūnchen), Germany, a leading center for research in metabolic diseases and systems biology. He previously worked as a postdoctoral researcher at the Max Planck Institute for Biology of Ageing in Cologne, Germany, where he also completed his PhD under the supervision of Prof. Dr. Thomas Langer.

Dr. Chandragiri's research focuses on the intersection of ageing biology, metabolism, and disease, with the goal of understanding how molecular mechanisms regulate lifespan and healthspan. His work is supported by competitive fellowships, highlighting his strong academic background and contributions to life sciences research.

1.3. The Sealed Universe Laboratory: A Thought Experiment on Exogenous Variables, Causality and Conscious Choice

Dr. Roshan Tiwari, *Research Scientist, Bhaktivedanta Institute, Kolkata, India*

My talk will introduce The Sealed Universe Laboratory, a thought experiment designed to explore Bell's idea of "exogenous variables" and what it really means for a choice to be genuinely independent. Imagine a perfectly sealed laboratory floating in space, completely isolated from the outside world. Inside the laboratory, everything starting from quantum random number generators, AI systems, human brains, and Bell experiments, evolves only according to the physical laws and initial conditions within the box. To the scientists inside, many events appear random and unpredictable. Yet from the perspective of an outside superobserver, every event inside the laboratory still belongs to one continuous causal chain. Even the outputs of quantum random number generators remain part of the laboratory's internal physical evolution.

The thought experiment then considers a different situation: an external conscious agent injects a measurement-setting bit into the sealed laboratory from outside the system. Unlike internally generated choices, this intervention does not arise from the laboratory's prior physical state and therefore acts as a genuinely exogenous input. The experiment highlights the difference between events generated within a closed causal chain and interventions entering from outside it. This leads to a deeper question connected to Bell's freedom-of-choice assumption: are conscious choices simply physical processes inside the universe, or can conscious agency introduce genuinely new causal origins into physical reality?

Dr. Roshan Tiwari is a physicist driven by a lifelong curiosity about the deep nature of reality and consciousness. He currently works as a Research Scientist at the Bhaktivedanta Institute, Kolkata, where he explores how ideas from quantum physics and information theory may shed light on the mystery of conscious experience. He completed his M.S. and Ph.D. in Physics at the Indian Institute of Science Education and Research (IISER) Kolkata in 2023, after earning his B.Sc. in Physics from Banaras Hindu University (BHU), Varanasi, in 2014. During his doctoral studies, he worked across a wide range of topics from spectroscopy and bio-inspired waveguides to microscopy, sensing, and optical trapping, publishing his work in leading international journals.

Beyond technical research, Dr. Tiwari is deeply interested in the philosophical and foundational questions: What is the role of information, observation, and agency in nature? How might the quantum description of the world connect with first-person conscious experience? At the Bhaktivedanta Institute, he is developing theoretical frameworks that bring together modern physics and insights from the Indian contemplative tradition.

1.4. Computation and Awareness

Sushant Sharma, *Bhaktivedanta Institute, Kolkata; Alumnus, IIT Guwahati, India*

When exploring the differentiation between awareness and computation, it is pertinent to bring up the Chinese Room argument, and the Halting Problem. By contemplating these thought experiments, one delves into the philosophical inquiries surrounding whether mere computational processes can truly equate to genuine understanding and consciousness.

In the Chinese room thought experiment, proposed by philosopher John Searle, Searle asks us to imagine a person who does not understand Chinese, sitting in a room with a rulebook and a set of Chinese symbols. This person receives Chinese questions from outside the room, follows the instructions in the rulebook to manipulate the symbols, and produces appropriate Chinese responses. Despite the person in the room not understanding Chinese, the responses might appear to an outside observer as if they were generated by someone who comprehends the language. Searle's argument is often used to question the idea that a computer or any other computational system, no matter how advanced, can truly understand or possess consciousness. He argues that even if a computer can simulate human-like responses through computation, it does not inherently understand the meaning of the information it processes.

The Halting Problem, introduced by Alan Turing, is a mathematical problem that questions whether a general algorithm can determine, for any arbitrary input and program, whether the program will eventually halt or run indefinitely. Turing's proof demonstrates that there cannot be a universal algorithm that solves the Halting Problem for all possible cases, suggesting inherent limitations in what computation can achieve.

A famous example of an undecidable problem is Goldbach Conjecture. The conjecture states: "Every even integer greater than 2 can be expressed as the sum of two prime numbers." Despite being tested extensively for vast ranges of even numbers, the Goldbach Conjecture remains unproven, and its verification for all even integers is an open problem in mathematics.

When considering awareness as the central theme, the connection can be drawn in how both the Chinese Room argument and the Halting Problem underscore the challenges in achieving a comprehensive, self-aware system through computation alone. They contribute to the ongoing dialogue about the nature of consciousness and the inherent constraints faced by computational models when it comes to replicating human-like awareness.

Sushant Sharma is a B.Tech graduate in Computer Science and Engineering from IIT Guwahati. He has a rich experience of over 15 years as an IT Professional, working with well-known organizations such as CATS-pvt Ltd, TCS, Techmahindra and Roamware. After his meeting with Dr. T. D. Singh, the Founder Director of Bhaktivedanta Institute, in 2000, he developed a keen interest in the domain of the synthesis of science and spirituality. Under the mentorship of Dr. Singh and his students, Sushant has been exploring the studies at the interface of foundations of computer science, mathematics and consciousness, and consequently has been delivering many talks in various conferences, seminars, and workshops organized by Bhaktivedanta Institute. His study interests include foundations of set theory and computer science, Gṭdel's incompleteness theorems and Vedanta. Currently, he is serving as Director of Cognitive Studies and Performing arts of Bhaktivedanta Institute.

1.5. Can Simulation Be Experience? A Computational Thought Experiment on Consciousness

Prabhakar Ballapalle, *Sandisk, Bengaluru, India*

Understanding whether consciousness arises purely from physical processes or requires additional non-computational properties remains a central challenge in the study of mind and intelligence. This paper introduces a novel thought experiment, the Firmware Consciousness Emulator, to examine whether consciousness can be fully realised through perfect computational simulation. The experiment considers a hypothetical system capable of replicating every neural state and transition within the human brain, ensuring identical input–output behaviour and memory evolution.

By comparing a biological brain (System A) with an exact computational simulation (System B), the framework isolates a fundamental question: whether functional equivalence implies conscious equivalence. If the simulated system exhibits consciousness, this supports computational or functionalist accounts, suggesting that consciousness emerges solely from information processing and causal structure. Conversely, if consciousness is absent despite perfect replication, this implies the existence of non-computational or substrate-dependent properties essential to conscious experience.

The thought experiment highlights a critical distinction between behavioural indistinguishability and subjective experience. Even under conditions of perfect simulation, external observation cannot resolve whether conscious awareness is present, thereby exposing limitations in empirical verification of consciousness. This leads to a deeper conceptual gap between objective descriptions of system behaviour and the subjective "what-it-is-like" aspect of experience.

Prabhakar Ballapalle is presently a Senior Technologist at Sandisk, Bangalore. His areas of research and development currently include flash controllers and enterprise storage systems etc. Before joining SANDISK, he worked in very prestigious companies like: WESTERN DIGITAL, SEAGATE, LSI, AGERE etc. He also worked as a scientist at Central Research Laboratory and contributed in many prestigious indigenous projects like, Development of Thermal Imager, Remote Surveillance System and Radar Video Transmission System, etc.

He received his M.Tech in Digital Signal processing from IIT-Kanpur in 2000. He has more than 10 publications and 5 issued patents to his credit. His research areas include Storage, pattern recognition, artificial intelligence, speech processing, audio processing, video processing etc. He is very actively involved in promoting the discussions on science & spirituality among the student's community and learned circles. He is also an associate editor of "Savijnanam", Bhaktivedanta Institute journal, "Tattva Jijnasa", Bhaktivedanta Institute Magazine and the booklet "God, Intelligent design and Fine tuning." His areas of interest in Science and Spirituality include Consciousness, Bio-feedback and Meditation, Effect of Prayers on Mind and Body, Japa Meditation, Personality Development etc.

Session 2

2.1. Thought Experiments in Chemical Engineering

Prof. Ramagopal Uppaluri, *Department of Chemical Engineering, IIT Guwahati, India*

Chemical engineering and associated sciences delve deeper into the

boundaries of the transformation of raw materials into useful products. To do so, unit processes and unit operations are to be followed through the objectively defined process flow diagrams. Invariably, chemical engineering involves the integration of the finer principles of fluid mechanics, heat transfer, thermodynamics, mass transfer and reaction engineering. Alongside, process integration and process systems engineering is duly followed to gain useful understanding into the possibilities to get beyond the boundaries.

Thought experiments aim to go beyond the conventional thoughts and hypotheses that are often validated in chemical engineering practice. Fundamental entities such as viscosity, diffusion, reaction rates etc., are envisaged to an ideal scenario, which is rather difficult to achieve. Often serendipity in experimental schemes as well alter the very direction in which such customized thinking is often adopted and envisaged.

In the presentation, a summary of various thought experiments in chemical engineering disciplines will be discussed. Notable among these are as follows. In the field of fluid mechanics, feasibility of infinite and zero viscosity, Reynolds number, perfect and no slip wall can be seen as important thought experiments that convey the limitations of the reality that we can imagine. In the field of mass transfer, zero and infinite diffusion, zero and infinite convection, zero and infinite interfacial mass transfer resistance, limits of simultaneous mass transfer with chemical reaction, diffusion limited vs. kinetics limited processes enable us to understand that the reality of chemical processing does have limits. In the field of reaction engineering, the implications of infinite reaction rate, perfect/no mixing, run way reaction, infinite recycling of a reactor do convey very useful insights into the reactive transformations and associated limitation in the reality. In the field of thermodynamics, the third law of thermodynamics is a classical example of the thought experiments. Along with this, perfectly reversible system,

dead universe with maximum entropy, time-entropy arrows do convey philosophically the nature of the reality in which we reside in this phenomenal world. In the process of systems engineering, zero waste producing chemical plants and optimization with mathematical / AI-ML modelling tools and their limitations can be analyzed to be useful to deeply understand the reality. In summary, the cited examples do convey the inevitability of thought experiments in chemical engineering and as well convey philosophically the reality of matter i.e., matter and its transformations are restricted to a certain limit and thought experiments do demonstrate such limits, even though in principle the thought experiment cannot be realized in practice.

Prof. Ramagopal Uppaluri obtained B.Tech. (Chemical Engineering) from Andhra University, Visakhapatnam, M.Tech. (Chemical Engineering) from IIT Kanpur and Ph.D. (Process Integration) from the University of Manchester, England. After a brief post-doctoral research at Robert Gordon University, Scotland, he joined IIT Guwahati and became the youngest Professor of IIT Guwahati in a very short span of time. Apart from his contributions to the Chemical Engineering Department at IIT Guwahati, he is affiliated with the Centre for Indian Knowledge Systems, School of Agro and Rural Technology, Centre for the Environment, and Centre for Sustainable Water. He was instrumental in launching the first International Joint M.Tech. degree in Food Science and Technology between IIT Guwahati, India and Gifu University, Japan. Till date, under his guidance, 28 PhD students received their highest academic degree in the research sub-theme of food science and technology, ceramic membrane technology, evolutionary engineering optimization, wastewater treatment, noble metal recovery from waste streams, polymer natural fibre composites, solid waste management, machine learning applications etc.

He has published 162 international journal publications and has

filed five Indian patents in the fields of surfactant enhanced oil recovery and palladium composite membranes. Presently, he supervises 13 Ph.D. students in diverse fields of food processing, waste to value products, machine learning applications and Indian knowledge systems. As the first Professor-in-Charge of the Green Office, Prof. Uppaluri also served as an administrator at IIT Guwahati and attempted to establish green policies at the IIT Guwahati campus. He is reputed at IIT Guwahati for two new courses, namely Refinery Process Design and Research Methodologies. He also served in other administrative positions at IIT Guwahati, including Professor-in-Charge Green Office, Chairman Technical Board, Vice-Chairman GATE-JAM and Member, Students' Disciplinary Committee. For about a decade, Prof. Uppaluri served in various capacities to assist and promote the activities of the Bhaktivedanta Institute, Kolkata. He received training and guidance from Dr. T. D. Singh (Founding Director of Bhaktivedanta Institute) to imbibe holistic aptitude towards the synthesis of science, philosophy and spirituality. He served the organization of the AISSQ conference series in several capacities. Presently, he is serving as the Honorary Director of the Distance Education wing of the Bhaktivedanta Institute, Kolkata and in this capacity, he is trying to encourage contact sessions and workshops for a short-term course on science and spirituality.

2.2. Thoughts on Chemical Origin of Life Research: Trends from a Computational Perspective

Dr. Sai Phani Kumar Vangala, *Department of Chemical Engineering, IISER Bhopal, India*

The origin of life is thought to have emerged through the gradual chemical evolution of simple molecules present in the primitive Earth's atmosphere and oceans into increasingly complex molecular systems. Prior to the appearance of the first unicellular organisms,

the early Earth environment was rich in fundamentally chemical constituents such as water, nitrogen, ammonia, carbon dioxide, oxygen-containing species, and phosphorus compounds. Through a series of prebiotic chemical transformations, these simple precursors are believed to have given rise to essential biopolymers, including RNA, DNA, proteins, and carbohydrates, ultimately paving the way for the emergence of life.

In this talk, we focus on the formation of biopolymers, with particular emphasis on the synthesis of RNA from its fundamental building blocks — phosphate groups (phosphoric acid), ribose sugars, and nucleobases/nucleotides. Using advanced computational approaches, we investigate the thermodynamic feasibility of RNA formation and compare it with alternative structural and reaction pathways. Although numerous simulation studies have explored various aspects of the chemical origin of life, the integrated application of classical molecular dynamics (MD) and ab initio density functional theory (DFT) to probe RNA formation remains relatively unexplored. In addition, this talk provides insights into recent advances in origin-of-life research, highlighting key developments and relevant literature in the field.

Dr. Sai Phani Kumar Vangala is an Assistant Professor in the Department of Chemical Engineering at Indian Institute of Science Education and Research Bhopal, where he works in the areas of computational catalysis, materials science, and sustainable energy. He completed his PhD in Chemical Engineering from Indian Institute of Technology Kharagpur in 2020, focusing on the computational design of catalysts using density functional theory. Following his PhD, he pursued postdoctoral research at leading international institutions, including Northwestern University and McGill University, where he worked on polymer recyclability and electrocatalysis for energy conversion. He joined IISER Bhopal as a faculty member in 2024, contributing to both teaching and research

in advanced chemical engineering.

His research focuses on the computational design of novel materials and catalysts for applications in energy storage, electrochemical conversion, and sustainable technologies. He integrates approaches such as machine learning, thermodynamics, and multiscale simulations to understand and optimize catalytic processes and advanced materials. Dr. Vangala has published research in reputed journals on topics like lithium-ion storage, electrocatalysis, and polymer systems, and actively contributes to interdisciplinary efforts in clean energy and materials innovation. His work aims to address global challenges in energy efficiency and sustainability through data-driven and theoretical approaches.

Session 3

3.1. Portals to A New Reality: Five Experiments to Unlock the Future of Physics

Prof. Vlatko Vedral, *Department of Physics, University of Oxford, UK*

In my talk, I will argue that we are on the brink of a new revolution in physics. I will describe a number of key thought experiments that test the foundations of physics, namely the interface between quantum physics and general relativity and the role quantum physics might play in the macroscopic domain. Some of the thought experiments aim to test how quantum physics alters the concepts of space and time that are fundamental to understanding general relativity, while others explore how the key principle of general relativity — the so-called equivalence principle — could impact quantum physics and lead to its modification. They are all underpinned by our understanding of what quantum physics is telling us about reality and how it applies to macroscopic objects.

Our rapid development of quantum technologies has now put us within reach of performing these experiments and rewriting our understanding of the Universe.

Prof. Vlatko Vedral is Professor of Quantum Information Science in the Department of Physics at the University of Oxford and a Principal Investigator at the Centre for Quantum Technologies, National University of Singapore. He has held this professorship since 2009 and is best known for his contributions to quantum mechanics, quantum information theory, and quantum entanglement. An active and influential researcher, Prof. Vedral has authored over 500 published and widely cited papers, covering a broad spectrum of quantum physics, including quantum computing, quantum cryptography, and quantum thermodynamics. His work has played a central role in shaping our understanding of entanglement as a fundamental resource and the role of information in physical theory. His research also engages deeply with foundational questions through thought experiments, exploring the nature of reality, the role of observers, and the quantum-classical boundary — making his work especially relevant to discussions at the intersection of physics and philosophy.

In recognition of his outstanding contributions, he was awarded the Royal Society Wolfson Research Merit Award in 2007. Prof. Vedral is also a celebrated science communicator and author. His acclaimed book Decoding Reality: The Universe as Quantum Information presents information as a unifying concept across disciplines. His latest book, Portals to a New Reality: Five Experiments to Unlock the Future of Physics (Basic Books and Allan Lane), was published on 25 October 2025, offering fresh insights into the future of fundamental physics through thought-provoking experimental ideas. Prof. Vedral's work continues to inspire new perspectives on information, reality, and the fundamental principles of the universe, making him a leading voice in both cutting-edge research and public understanding of quantum theory.

Day 3: 07 June 2026 (Sunday)
Session 1

1.1. Reimagining the Observer: Indian Knowledge Systems as Frameworks for Modern Thought Experiments in Consciousness

Vasudeva Rao, *President, Bhaktivedanta Institute, Kolkata; Alumnus, IIT Kanpur*

Modern physics and cognitive science are increasingly confronting the limits of objective, reductionistic paradigms, particularly when addressing the "Hard Problem" of consciousness. While historical thought experiments by figures like Einstein and Schrödinger have successfully probed the boundaries of physical laws, they consistently reach an impasse when dealing with the role of the conscious observer. This paper proposes a systematic integration of classical Indian Knowledge Systems (IKS), like the *Sankhya* dualistic framework, alongside the *Pancha-Kosha* model and non-dualistic *Drig-Drishya Viveka*, to expand the methodology of modern thought experiments.

Unlike Western philosophical traditions that treat thought experiments primarily as tools for testing logical consistency, IKS deploys them as rigorous, internal, experiential methodologies (*Sadhana*) to isolate and study consciousness. *Sankhya* philosophy provides a precise ontological classification by dividing reality into *Prakriti* (which encompasses all physical matter, energy, and subtle cognitive mechanisms like the mind and intellect) and *Purusha* (the non-material, fundamental witness consciousness). By categorizing cognitive processes as subtle configurations of matter, *Sankhya*

cleanly segregates the observer from the observed. A simplified *Sankhya* is also described in *Bhagavad-gita*. The *Drig-Drishya Viveka* is a classical text of Advaita Vedanta, the non-dualistic school of Hindu philosophy. Its primary purpose is to establish the non-dual nature of reality by systematically discriminating between the Seer (the pure Subject/Consciousness) and the Seen (all objects, including the mind, senses, and body). This paper demonstrates how incorporating these ancient frameworks into modern scientific discourse provides a structured, verifiable classification for subjective experience, offering a path forward to transform consciousness from a scientific enigma into a fundamental parameter of reality.

Vasudeva Rao (also known as His Holiness Bhaktisvarupa Vrajapati Swami) obtained his M.Tech. (Computer Science, 1998) from IIT Kanpur, India. After a brief tenure of working as a software professional, he decided to significantly contribute himself to the science spirituality interface under the able leadership and vision of Dr. T. D. Singh, the Founder Director of the Bhaktivedanta Institute. Presently, His Holiness is the President of Bhaktivedanta Institute and actively promotes discussion on science and spirituality. He is also the Editor of Bhaktivedanta Institute's reputed annual journal, Savijnanam – Scientific Exploration for a Spiritual Paradigm and travels widely across India and abroad.

His deep interest in the foundations of mathematics, fundamentals of computer science and logic and its relation to nature of reality as well as ancient Indian texts led him to interact and meet renowned scholars at Harvard, Princeton, ETH, Stanford, and MIT. He has delivered several talks on topics at the interface of science and spirituality.

1.2. Multilingualism, Self, and Consciousness: Towards a Theory of Diversity-Induced Modulation of Self

Prof. Ramesh Kumar Mishra, *Centre for Neural and Cognitive Sciences, University of Hyderabad, India*

While the human brain has evolutionarily equipped itself to learn and use multiple languages with remarkable computational efficiency, the last five decades of research in this domain have missed a critical link, that is, how the very desire and ability to speak multiple languages and develop expertise in them, influences agency and self. Interestingly, philosophers also have paid limited attention to multilingualism per se, despite philosophy of language remaining a dominant intellectual tradition for centuries. In this context, it makes practical sense to ask a foundational question about how people experience different modes of self as they speak different languages, to different interlocutors, in different social contexts, across cultural boundaries.

Evidence suggests, people who speak many languages can develop different moral stance. Multilingualism also influences core cognitive processes such as attention while contributing to social relationships and economic prosperity. However these reasons are insufficient to remain satisfied when we still do not know how the agent who claims to be a multilingual, experiences variations in the self as he practices multilingualism. I bring my recent thinking to question this and introduce the concept of diversity induced modulation of self as particularly relevant to the Indian context. In this talk, I shall explore how multilingual and multicultural practices may shape experiences of different selves across specific temporal and social contexts. My attempt will be to theoretically present this thinking while grounding it to current research by others and proposing empirical possibilities. Further, re-visiting the Hard Problem of consciousness, as discussed more recently by Pohl

and colleagues (2026), creates a possibility to link experimental neuroscience, cognitive science, cognitive psychology, and philosophy of language and mind to evolutionarily answer a fundamental question. This way of looking at the dynamic evolutionary interaction of minds, society, and cultures, crowns scientific thinking in cognitive science to those concepts, such as consciousness and self, that have remained elusive.

Prof. Ramesh Kumar Mishra is a Professor of Cognitive Science at the University of Hyderabad, India. He earned his PhD in Linguistics from the University of Delhi and subsequently completed postdoctoral research at the National Brain Research Centre, India. His research spans a broad range of topics in cognitive science, psycholinguistics, and cultural cognition, with particular emphasis on the effects of literacy on cognition, bilingualism, visual attention, and real-world applications of cognitive science. Prof. Mishra has made significant contributions to the academic community through both research and leadership roles. He is currently the Editor-in-Chief of the International Journal of Cultural Cognitive Science (Springer) and serves on the scientific program committee of the Indian Association for Cognitive Science. He has also been a member of the editorial boards of leading journals, including Frontiers in Cognition, Bilingualism: Language and Cognition, PLOS One, Scientific Reports, and the Journal of Experimental & Theoretical Artificial Intelligence, among others.

He has authored and edited several monographs, books, and edited volumes in psycholinguistics and cognitive science. His recent book, Cognitive Science: New Developments and Future Directions (Routledge), reflects contemporary advances and emerging directions in the field. Prof. Mishra is a founding member and One World Representative of the Society for the Cognitive Science of Culture (SCSC) and has been a Fellow of the Psychonomic Society since 2009. He was also an early recipient of the prestigious

Erasmus Mundus Fellowship from the European Commission, which supported his studies in clinical linguistics in Europe. He has delivered invited keynote lectures at major international conferences, including at the University of Ghent and the Max Planck Institute for Evolutionary Anthropology. Prof. Mishra's work continues to advance our understanding of language, cognition, and culture, making him a leading voice in contemporary cognitive science.

1.3. Thought Experiments and Molecular Reality: From In Vivo Observation to In Silico Exploration

Dr. Dube Dheeraj Prakashchand, *Centre for Human Computer Interaction, IIT Mandi, India*

Scientific understanding of biological systems has evolved through complementary modes of investigation. In vivo studies allow observation of biological phenomena within living organisms, preserving the complexity and emergent behavior of life itself. In vitro approaches isolate specific components of living systems into controlled chemical environments, enabling focused investigation of molecular and biochemical processes. Extending this progression further, in silico methodologies such as molecular dynamics simulations create computational representations of molecular systems, where proteins, nucleic acids, membranes, drugs, and other biomolecular players can be visualized and studied with atomic-level detail under carefully controlled theoretical conditions.

In this sense, computational biology and molecular simulations represent an advanced form of scientific thought experimentation. Before a molecular mechanism is experimentally verified, it is often first imagined, modeled, visualized, and computationally explored. Molecular dynamics therefore acts not merely as a numerical tool,

but as a dynamic realization of scientific imagination, allowing researchers to investigate interactions, conformational changes, and mechanistic possibilities that may remain inaccessible through direct experimentation alone. Modern biological research increasingly depends on this interplay between experimental observation and computational thought-based exploration for deeper mechanistic understanding.

This relationship between conceptualization and manifestation also finds striking resonance within the Vedantic and Sāṅkhya knowledge traditions, where creation itself is understood to emerge first at the level of consciousness or mind before appearing in material form. Every technological invention, scientific model, or experimental design must first exist as an idea before becoming physically realized. Similarly, computational experiments occupy an intermediate space between thought and physical experimentation, transforming abstract conceptualizations into structured scientific inquiry. The convergence of modern computational biology with these philosophical perspectives highlights the profound role of thought experiments in both scientific discovery and human creativity.

Dr. Dheeraj Dube Prakashchand is a faculty member in the School of Mechanical and Materials Engineering at Indian Institute of Technology Mandi. His research lies at the intersection of materials science, mechanics, and molecular-scale modeling, with a strong emphasis on understanding material behavior using computational tools such as molecular dynamics simulations and density functional theory (DFT). His work spans both engineered materials and biomaterials, including biological and bio-inspired systems, where multiscale structure–property relationships play a critical role. In addition to fundamental research, he is actively involved in product design and translational engineering activities within the materials engineering domain, bridging scientific insight with

practical application.

Dr. Prakashchand received his Ph.D. from the Tata Institute of Fundamental Research, where his doctoral work focused on advanced theoretical and computational approaches to complex physical systems. He subsequently carried out postdoctoral research at the University of California, San Diego and at Georgia State University, gaining extensive international research experience across disciplines spanning materials physics, biological systems, and computational modeling. His broader interests include interdisciplinary research that connects mechanics, materials, and biology, as well as the development of scientifically grounded frameworks for emerging engineering and technological challenges.

1.4. The Geotechnique Quandary: Memory, Entanglement and the Myth of the Undisturbed

Dr. Manas Chandan Mishra, *Assistant Professor, School of Civil Engineering, KIIT Deemed to be University, Bhubaneswar*

Traditional understanding of geotechniques assumes soil to be an inert, passive, even "dead" particulate matter. Further, it is scientifically established that soil behaviour can be understood leading to prediction of failures and catastrophes with dependable accuracy. This discussion, however, attempts to reason that the very fundamental of "undisturbed sampling" is a structural contradiction. The concept of undisturbed sample and its extraction presents an ontological debate, making it the equivalent of Heisenberg Uncertainty in geotechnology. Central to this argument is the notion that the same electrochemistry with the same boundary/loading conditions on a mass of soil exhibits different behaviour, which might be due to the retention of its

geoenvironmental "trauma" with an adaptive memory and an interactive inter-particle sunyata or void.

Considering an example of a highly reactive and challenging industrial waste such as red mud, this discussion further emphasizes the role of an "Observer" in addition to the experiences the matter goes through in determining its potential. In order to explore the possibilities, geospatial entanglement of red mud is discussed across vast temporal as well as spatial scales in addition to its silent cascading effects. A geotechnical engineer can thus be considered as a modern Wigner's friend whose prediction may actually be an architect of soil's future and the interventions may be the instruments in converting remote and random risks into certain reality. This discussion intends to steer modern soil mechanics towards entangled physics, epistemology and temporal reality.

Dr. Manas Chandan Mishra is an Assistant Professor in the School of Civil Engineering at KIIT Deemed to be University, Bhubaneswar. He holds a Ph.D. from IIT Bhubaneswar, specializing in Environmental Geotechnology and Alternative Geomaterials, and an M.Tech from IIT Gandhinagar. His professional background includes significant industry experience managing large-scale urban infrastructure, such as the Bangalore Metro Rail Project and major commercial developments. Currently, his research focuses on sustainable engineering and the environmental lifecycle of materials. Outside of academia, Dr. Mishra is an avid cyclist who travels across India to explore and document the country’s rich cultural heritage. This passion for exploration informs his interdisciplinary approach to engineering, where he bridges technical innovation with historical and philosophical contexts.

2.1. A Thought Experiment on the Origin of Universe

Abhiman Udayakumar Shetty, *B.Tech., IIT Bhubaneswar*

This paper seeks to explain a thought experiment based on how the universe was born. I used 2 theories: Stephen Hawking's quantum fluctuation theory and Theodor Kaluza's Black hole Mirage theory and one paradox: If God created everything, who created God? If there is a cause, that cause becomes God bringing back the same question. Stephen Hawking's theory stated that the big bang may have been caused by a quantum fluctuation. The black hole mirage theory states that the universe was an ejection from a 4D black hole, produced as soon as the 4D star collapsed into that black hole. Through these three theories I made 3 models: One that assumes quantum fluctuation theory to be right and Black hole mirage to be false, one that assumes only black mirage theory is true and other to be false, and one that assumes both the theories to be correct in different contexts.

In the first model, the assumption I took is that quantum fluctuations only occur inside a universe. In the second model, my assumption was that there is no limit to the number of dimensions a universe can take, meaning I assumed that 1D, 2D, 3D, 4D, and so on universes can exist. The third model takes elements from both the previous models, we take the assumptions that Quantum fluctuations exist only inside a universe, higher and lower dimensional universe exist with lower limit being 0-dimensional universes and there being no upper limit to the number of dimensions and that both theories are true in different contexts. These models will not be able to give a final conclusive origin to our universe but could give insights on how our universe was formed.

Some special mentions would be Sir Roger Penrose's conformal concyclic cosmological model and Alan Guth's Eternal inflation theory as they are also focused in a similar area of focus.

2.2. The Quantum Librarian: Bridging the Measurement Problem and Ancient Wisdom

Ruthvik Galem, *Research Scholar, Bhaktivedanta Institute, Kolkata; Alumnus, IIT Bhubaneswar*

How does a universe governed by mathematical probabilities transform into the concrete, meaningful experience of a human life? This presentation introduces "The Quantum Librarian," a thought experiment designed to reconcile the "Measurement Problem" of modern physics with the ancient wisdom of the Bhagavad-gita (18.14), which identifies five essential factors for the accomplishment of any action: the physical field (the body), the doer (conscious soul), the instruments (mind and senses), the individual endeavor (free will), and the ultimate sanctioner (God). In this thought experiment, the physical field is the Library of Ink, the doer is the Reader, the instruments are the Languages of the Books, the individual endeavor is the exercise of Free Will, and the ultimate sanctioner is the Librarian.

In the quantum world, reality exists as a "superposition" — a cloud of infinite potential. This material field is like a Library of Ink, where initially nothing is written in any book; instead, every possible story exists as a blur of letters governed by strict laws of grammar (physics). However, for a "story" to emerge, a non-material Reader (the conscious soul) must use the instruments of perception and the individual endeavor of Free Will to choose a path. By analyzing the interaction between the Reader and the Librarian, this discussion shows that the world must be structured as a field of possibilities to facilitate true Free Will. Without these "quantum

blurs" we would be mere characters in a pre-printed, deterministic book. Instead, we are active participants whose conscious intent triggers the collapse of the wave function. This lecture offers a rigorous yet accessible framework for understanding the soul as the essential catalyst that turns mathematical probabilities into the lived story of reality.

2.3. Wigner's Friend and Observer Dependent Descriptions

Akash Pujari, *IIT Madras*

Eugene Wigner introduced an infamous thought experiment highlighting the conflict between different yet apparently valid descriptions of measurement in quantum mechanics. Beginning with the tension between unitary evolution and definite measurement outcomes, this thought experiment introduces seemingly incompatible descriptions of the same experiment. The tension tightens when we take into account the friend as an experiencing observer with a definite observed outcome. Modern extensions of Wigner's friend thought experiment sharpen this tension into both a logical and a philosophical problem involving multiple observers. One natural response to this is that quantum states are relative to an observer or informational context. Emily Adlam characterizes this as a type of "disaccord" in quantum theory, where the quantum state cannot be read naively as a direct description of the friend's experience. Adlam also goes deeper and asks if this relativity between states can be applied to observed events themselves. Through Adlam's framework, I explore whether Wigner's friend points us to this disaccord between observers, if we hold the universality of quantum theory to be true. This suggests that relative or perspectival descriptions may play a deeper role in quantum theory, while leaving open the question of how far such relativity should be taken.

2.4. Artificial Brain & Conscious Experience

Jagadishwar Dasari, *Technical Lead, Bhaktivedanta Institute, Kolkata; Alumnus, IIT Gandhinagar*

Life itself is a profound and beautiful experience. From the vastness of the universe to the intricate complexity of the quantum world, human inquiry has continuously expanded the boundaries of scientific understanding. Yet amid these remarkable developments, one fundamental question remains deeply mysterious: conscious experience. As philosopher David Chalmers famously stated, "The really hard problem of consciousness is the problem of experience… it feels like something to be a conscious agent."

Modern science has revolutionized our understanding of reality — from classical physics to quantum mechanics, artificial intelligence, and advanced neuroscience. However, despite extraordinary progress in understanding the external world, the nature of subjective conscious experience continues to challenge philosophers, scientists, and neuroscientists alike. This presentation explores conscious experience through philosophical reflections, experiential analogies, and a thought experiment inspired by contemporary discussions in science and philosophy. Through questions of perception, awareness, and intelligence, these discussions invite possible interpretations that may contribute to further inquiry into the nature of subjective experience and consciousness.

2.5. Mind as a Laboratory

Y. Monalisa, *B.Tech., IIT Bhubaneswar*

Thought experiments are imagined situations used to test ideas, examine concepts, reveal hidden assumptions, and understand the logical consequences of a theory. Mind acts as a laboratory helping

us explore questions that may not be easily tested through direct physical experiments.

We aim to understand various thought experiments across science, philosophy, consciousness, artificial intelligence, morality, and Indian knowledge systems. It will explore their underlying assumptions, observations, and implications, while asking what they reveal about reality, the self, human behavior, decision-making, ethics, and purpose.

By studying thought experiments such as those related to the mind-body problem, free will, morality, identity, and consciousness, this work seeks to show how they can improve critical thinking, deepen self-reflection, and help human beings become more thoughtful, ethical, and aware. Let's perceive thought experiments as a bridge between scientific imagination, philosophical reasoning, and spiritual insight.

2.6. The Observer's Dilemma: Human Consciousness vs. Statistical Models

Rajesh Pandit, *Quality Analyst, Learningmat; Alumnus, IISER Kolkata*

In the last few years people have been using statistical prediction models and machine learning algorithms a lot. These systems are used for things like policing, medical diagnosis and financial forecasting. They are also used for recommendation systems and behavioral analytics. Most of these models are based on math concepts like probability and accuracy.

However many of these models assume that the person being predicted does not change because of the prediction. This might work for things like weather. It does not work for people. People can change what they do when they know what is predicted. This can

affect the outcome. This creates a problem where the prediction can change what happens. Then that change can affect the next prediction.

The presentation "The Statistical Mirror: Humans Inside the Prediction Loop" is about an idea that combines statistics with how people think. It looks at what happens when people know what a prediction model says. They start to react to it. The presentation uses ideas, like positives and conditional probability to show that even good prediction systems can make a lot of mistakes when people are aware of them. It also says that when people know what is predicted they can change what they do and this can change what happens next.

By looking at how statistics machine learning and human thinking are connected, this work shows the limits of trying to predict what people will do. Statistical prediction models and machine learning algorithms are limited when it comes to predicting behavior. The Statistical Mirror presentation explores these limits and how they affect predictive policing, medical diagnosis and financial forecasting.

2.7. Transparent Mind Network: Consciousness beyond Computation

Naramshetti Padmaja, Vivaram Hemanth Kumar, Haridasu Akhileshwari, Goda Mohan Krishna, *B.Tech., RGUKT Nuzvid*

Human consciousness remains one of the greatest mysteries in science and philosophy. Despite major advances in neuroscience and artificial intelligence, an important question still remains unanswered: can emotions, morality, and self-awareness be fully explained as biological computation, or is consciousness something deeper than neural activity? As technology increasingly connects humans with machines, understanding the true nature of conscious

experience becomes more significant than ever before.

Consciousness refers to the first-person subjective experience of awareness. It includes thoughts, emotions, imagination, memories, inner speech, and the sense of self. Unlike observable behavior or measurable neural signals, consciousness involves the internal feeling of experience — the "what it feels like" aspect of existence. This creates the mind-brain problem, which examines whether subjective awareness can truly be reduced to physical brain processes alone.

To explore this mind-brain problem, a thought experiment titled Transparent Mind Network is proposed, which may be experimentally verified with advancements in technology in the near future. The Transparent Mind Network is a global system that enables the sharing of brain signals among individuals implanted with a Cognitive Link Chip. Through this thought experiment, we attempt to provide a possible explanation for the mind-body problem and explore whether consciousness may involve aspects beyond purely physical processes.

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About Bhaktivedanta Institute

The Bhaktivedanta Institute was founded by His Divine Grace A. C. Bhaktivedānta Swami Prabhupāda in Vrindavan in August 1974. Śrīla Prabhupāda was one of the greatest exponents of Vedic culture in the 20th Century. He strongly felt that modern civilization is completely misdirected by scientific materialism and there is an urgent need to introduce the spiritual knowledge and wisdom of the *Bhagavad-gītā* and the *Śrīmad-bhāgavatam*, the essence of all the Vedic literatures, to the scientists, philosophers, scholars and students of the world. He noticed that all the prestigious academic institutions and universities of the world were teaching many different subjects but they had left out the most important branch of knowledge—the science of the soul. He envisioned that this spiritual knowledge of life would help restore an ethical culture for modern society. Thus, there would be hope for bringing lasting happiness and world peace. He felt that introducing this spiritual culture should be the contribution of India for the welfare of humanity. Śrīla Prabhupāda appointed his disciple Dr. T. D. Singh (Bhaktisvarūpa Dāmodara Swami) as the director of the Institute from its very inception and left several instructions to him to carry forward his vision.

The Bhaktivedanta Institute is a center for Advanced Studies in Science and Vedānta and focuses on a consciousness-based paradigm. This spiritual paradigm has a unique potential to resolve the mind-body problem, the question of evolution and

life's origin and many other philosophical and ethical concerns. Thus, this paradigm will have profound significance for science, religion, and their synthesis. One of the primary objectives of the Bhaktivedanta Institute is to present this paradigm for the critical attention of serious scholars and thinkers throughout the world. As such, the Institute supports a closer examination of existing scientific paradigms in cosmology, evolution, physics, biology, and other sciences. The Institute also promotes scientific, philosophical and religious dialogues among scientists, scholars and theologians of the world covering various common conceptual grounds of science and religion for the purpose of creating a better and harmonious understanding among all people. In order to achieve these goals, the Institute organizes international conferences regularly and publishes books and journals. Interested persons may contact the secretary of the Institute at:

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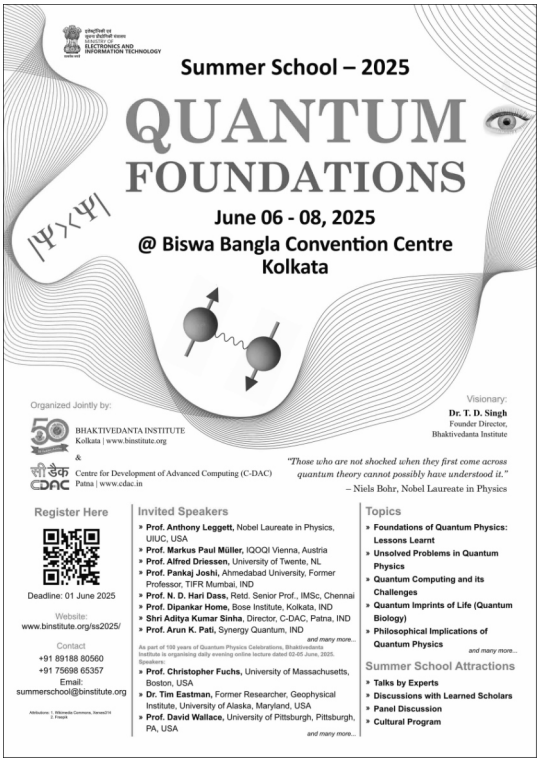

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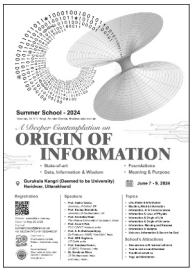

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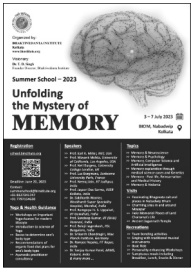

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Appreciations by Past Participants

The way every lecture was presented, strong arguments were given to prove their points and they really widened my thinking.

– Prajwali Praveen Khirid

I liked how you connected spirituality to science and explained it very clearly and scientifically.

– Anitha Mandala

This kind of arrangement for delivering value education even at this pandemic influence where people are so much in depression and exhaustion being unable to be free to communicate properly outside. I am very much impressed with the beautiful arrangement made by BHAKTIVEDANTA INSTITUTE who worked so hard by themselves for the welfare of everyone. Thank you.

– Brajalika Devi

What was most amazing was that everyone, in their own way, has to the best of their ability tried to expand, explain the existing facts and give a theory to what may be... And that's the first step to any research. This platform has been a yardstick to measure up against the best in the field, a way to glance at it through a window of safety (i.e. student's life) and prepare for what's expected in the field to come up successful if we step into research.

– Akash Dilip Tejwani

I liked the in-depth knowledge and dedication of each of the teachers for their research.

– Siddharth Panwar

I really loved the explanation of Vedic perspective and why Science can't explain the origin of life. Especially the session by Prof. Wickramsinghe and Prof Tour.

– Ravi Garg

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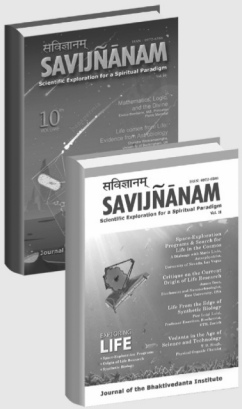

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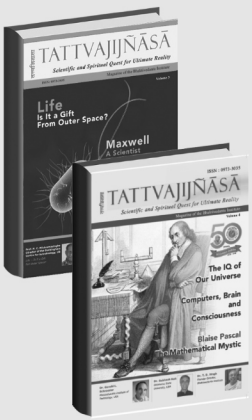

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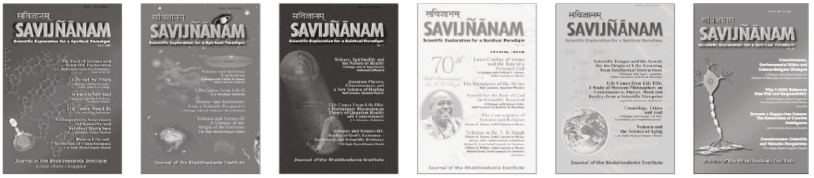

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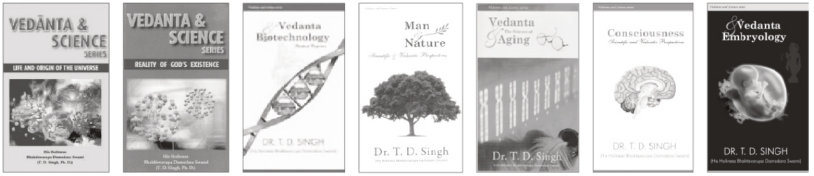

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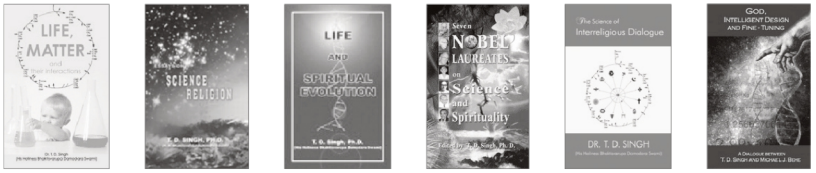

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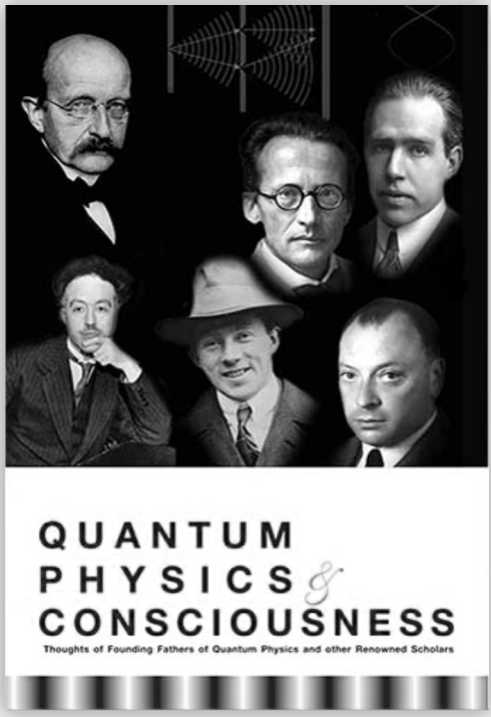

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