

Bharat and its Scientific Glory

As an enduring civilization, Bharat has a rich history of science since ancient times. Where on one side, the well-planned cities and roadways of the Saraswati Valley civilization are a testament to our engineering feats since antiquity, correspondingly, the immense developments in astronomy, mathematics, prosody, arts, etc. have firmly established our credentials in the domain of scientific knowledge.

Differing from the enlightenment philosophies of science (Empiricism, Positivism, Reductionism, etc.) that sternly distinguish between science and arts, the Bharatiya vision of science flows from a unity of knowledge that recognizes the fundamental experiential reality to be 'Truth, Consciousness and Bliss' (Sat, Chit, Aananda). This underlying unity is recognized across disciplines, such as in vidya (orally transmitted knowledge) and kala (skill-based knowledge), making the Indian approach to science truly multidisciplinary.

While there is a two-fold classification of subjects into para vidya (direct experience of brahman) and apara vidya (material knowledge keeping brahman at the core), the source of both these vidyas is identified as one. As an example, the Ganitasarasangraha notes in the case of mathematics:

लौकिके वैदिके वापि तथा सामयिकेऽपि यः।

व्यापारस्तत्र सर्वत्र संख्यानमुपयुज्यते॥

कामतन्त्रेऽर्थशास्त्रे च गान्धर्वे नाटकेऽपि वा।

सूषशास्त्रे तथा वैद्ये वास्तुविद्यादिवस्तुसु॥

“The science of numbers is used in all transactions whether earthly or Vedic, meditation or business, in the science of love, in the art of cooking, in economics and statecraft, in music and medicine, in theater, architecture and all such things.”

The Indian approach to science can be considered to be extremely pragmatic, which follows meticulous observation of nature to infer the algorithms at work,

as opposed to applying deductive logic to create models of reality. While modern science today is heavily reliant on model formulation and corresponding experimentation of data to test the model, it also runs the risk of fraud, where data may be corrupted to validate the model.

Due to its emphasis on truth and its distrust of universal axioms, the Indian approach is more comfortable with contradictions in models of reality. As pointed out by Wendy Doniger O Flaherty:

“Many Indian texts are troubled by contradiction; their attitude in this may seem to us Platonic. . . . But they do not ultimately iron out the contradictions; they alter their definitions of reality to let the contradictions survive.”

The latest discoveries in science today posit that reality may not be how we perceive it ordinarily, but that it is quantum, which is a finding in consonance with the Indian approach.

In our brush with British colonialism, we went into a stupor and came to accept the colonizer’s narrative of our history. In this narrative which is unfortunately mainstream to this day, all scientific achievements of the ancient world have been attributed to Greeks, with scant mention of Indians or their contributions. As the famous 19th-century Indian scientist Prafulla Chandra Ray noted, “These (colonial) scholars seem to smart under a sense of injury if they have to confess that Europe owes an intellectual debt to India, hence many futile attempts to explain away positive historical facts.”

Dharampal in his famous book ‘Indian Science and Technology in the 18th Century’ cataloged various scientific practices which had survived into the 18th century such as inoculation, metallurgy, use of drill plow in agriculture, paper making, naval architecture, etc. Similarly, various other works also document the scientific glory of Bharat since ancient times. Thus, there is no credence to the theories that claim that India did not have a well-developed technological base in science due to its social systems.

As science is pressed to become the handmaiden of economics and technology today, the Bharatiya approach to science must make a comeback and steer its pursuit back in the direction of truth, joy, and beauty.

As we move confidently towards the goal of Viksit Bharat by 2047, we need to retrace our approach to science and discover new avenues in scientific thinking. The approach can be thought of as a 16 knowledge paradigms approach, developed by IIT Hyderabad professor Mohan Raghavan, covering various domains and combining the knowledge of all:

1. Vedic Philosophical and Cognitive Sciences
2. Historical and Civilizational Sciences
3. Contemporary Social / Cultural Sciences
4. Mathematical, Physical, and Astronomical Sciences
5. Speech and Linguistics
6. Political, Economic, and Strategic sciences
7. Medical and Health sciences
8. Culinary, Nutritional, and Pharmacological Sciences
9. Agricultural Science, Veterinary and animal husbandry
10. Performing Arts
11. Mechanical & Digital Design & Engineering
12. Civil and Architectural Science
13. Fine Arts and Sculpture
14. Chemical, Metallurgical & Material Sciences
15. Fashion and Interior Design
16. Edutainment Sciences

To further refine and bring the topics in a more modular form for participants to present in a more effective way following themes can be considered.

Themes for Competition

- 1. Pramāṇa vijñāna (Vedic Philosophical and Cognitive Sciences)**
- 2. Khagola vijñāna (Astronomy)**
- 3. Gaṇita (Mathematics)**

4. Chemistry Rasa Śāstra and Metallurgy Dhātu Vijñāna
5. Vāstukalā (Architecture) and śilpaśāstra (Sculpture)
6. Kṛṣi Vijñāna (Agriculture)
7. Yantra Vidyā (Mechanical Sciences)
8. Āyurveda (Medicine)
9. Paryāvaran Śāstra (Environment and Ecology)
10. Yuddha vidyā (Military Sciences)
11. Rājya, samāja va śāsana tantra (State, Society and Polity)

Competition Structure and Flow:

A: Preliminary Round

All submitted presentations will be reviewed, and the top fifty will be shortlisted. An esteemed institution will be designated to undertake the responsibility of evaluating and categorizing the entries based on research quality and the prescribed eligibility criteria. Proposed institutions for this task can be Institutes of National Importance INI like the ŚIKṢĀ Centre for Indian Knowledge Systems at IIT Kanpur or the IKS Project at IIT Delhi or other prominent HEIs.

B: Final Round

The selected teams will be invited to present their ideas before an esteemed panel of judges, who will evaluate the submissions based on originality, depth of research, and subject mastery.

Template for Presenting Ideas:

1. Sources and Texts Introduce the foundational texts and primary sources of Indian Knowledge Systems (IKS), including ancient manuscripts

and treatises that preserve scientific and technological knowledge from India's past. Highlight key texts and their contributions to various disciplines.

2. Cogent Statement of Knowledge and Ideas Focus on presenting the derived knowledge and ideas from IKS in a clear, structured, and coherent manner. Emphasize simplifying complex concepts to make them accessible and understandable across diverse academic and professional audiences.

3. Schools & Thinkers Explore various schools of thought and notable thinkers within the Indian tradition who have significantly contributed to the fields of science and technology. Discuss their historical impacts, philosophical foundations, and the evolution of these ideas over time. Provide a critical understanding of the intellectual landscape of IKS, showcasing its relevance to contemporary scientific discourse.

4. Applications and the Way Forward Examine practical ways to integrate ancient Indian scientific knowledge with modern practices. Explore innovative approaches, potential future research directions, and teaching methodologies that leverage IKS. Encourage participants to propose new methodologies and projects aimed at advancing IKS in contemporary contexts and addressing current societal challenges.

Example for Understanding the Template

The concept of **Tri Doshas** in Ayurveda can be used to demonstrate the application of this template:

1. **Sources and Texts:** The concept of Tri Doshas is primarily derived from classical Ayurvedic texts such as the Charaka Samhita and Sushruta Samhita. These texts provide detailed descriptions of Vata, Pitta, and Kapha, the three fundamental energies governing the human body.
2. **Cogent Statement of Knowledge and Ideas:** Present the idea of Tri Doshas by explaining how each dosha influences bodily functions, health, and disease. Simplify the complex Ayurvedic terminologies for broader understanding, illustrating how balance among the doshas leads to

well-being.

3. **Schools & Thinkers:** Highlight the contributions of ancient Ayurvedic scholars such as Charaka and Sushruta. Discuss how their insights into the Tri Doshas have shaped traditional and modern health practices.
4. **Applications and the Way Forward:** Explore how the Tri Doshas framework can be applied in modern wellness practices, personalized healthcare, and preventive medicine. Propose future research on integrating Ayurvedic principles with contemporary medical science to develop holistic health solutions.