

Vigyan Setu e-magazine



Special Issue

Celebrating Science Tourism in India

Vigyan Setu e-magazine

A quarterly, bilingual e-magazine of Vigyan Setu Foundation®

Contents

i	About the Cover	Pg. 1
ii	Editorial	Pg. 2
iii	Editorial Team	Pg. 3
1	Science Tourism: An Overview	Pg. 5
2	Science Tourism in Jammu and Kashmir	Pg. 7
3	The Textile Tourism of India	Pg. 15
4	Nalanda Mahavihara	Pg. 20
5	Science Tourism – Students' Impression	Pg. 24
6	मेनार एवं खींचन	Pg. 28
7	Acoustic Tourism in India	Pg. 34
8	Konark Sun Temple	Pg. 37
9	अंतरिक्ष - यात्रा	Pg. 40
10	Exploring the Stars	Pg. 41
11	एक्सोम मिशन पर आधारित विज्ञान प्रश्नोत्तरी	Pg. 44
12	Event Reports	Pg. 49

Vigyan Setu e-magazine is a quarterly, bilingual publication by Vigyan Setu Foundation that bridges the gap between science and society. Curated with creativity, curiosity, and critical thinking, this e-magazine features insightful articles, creative expressions, and real-world applications of science, technology, and innovation. It aims to nurture scientific temper, celebrate young minds, and spotlight emerging researchers whose work is shaping a sustainable future.

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About the Cover

BOGIBEEL BRIDGE, ASSAM



Spanning the mighty Brahmaputra in the far northeast, the Bogibeel Bridge is India's longest rail-cum-road bridge — a true symbol of innovation, resilience, and connectivity. Designed to withstand high seismic activity and extreme weather conditions, this engineering feat blends cutting-edge steel-welded construction with strategic military utility. More than just infrastructure, Bogibeel is a bold statement in science tourism, showcasing how modern civil engineering can unite regions and overcome nature's toughest challenges.



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From the Editor's Desk

Dr. Neha Sharma



In an era where travel transcends leisure to embrace education, culture, and innovation, the concept of science tourism emerges as a trending fascination. The contents of this thematic 3rd issue of VIGYAN SETU e-magazine, provide a rich tapestry showcasing the expense of science tourism.

Opening with a comprehensive overview by Dr Lalit, the exploration of science tourism sets the stage for understanding how scientific inquiry and heritage can transform travel experiences. Insights into Jammu and Kashmir by Dr. Balwan, reveal how this pristine region offers unique scientific attractions, blending natural beauty with educational exploration. Similarly, Dr. Meena's examination of India's textile tourism underscores the intricate science woven into traditional crafts, highlighting the confluence of technology, history, and art.

The historical dimension is vividly captured through Dr. Nimisha's study of Nalanda Mahavihara, a beacon of ancient scientific learning and scholarly pursuit, reminding

us that the roots of science tourism run deep in India's intellectual heritage.

Complementing these perspectives, the students' impressions bring fresh, youthful viewpoints, reflecting how science tourism ignites curiosity and learning among the next generation.

The edition also embraces linguistic and cultural diversity, with contributions by Mr Satish Kumar and Mr Gaurishankar in Hindi, enriching the discourse with regional voices and poetic expressions that celebrate the wonder of scientific journeys. An article focusing on acoustic tourism introduces a novel sensory dimension, expanding the boundaries of how science can be experienced through sound.

Architectural marvels like the Konark Sun Temple, explored by Dr. Smruti, stand as testament to the fusion of science, spirituality, and aesthetics, captivating travellers with their astronomical alignments and engineering prowess. The cosmic theme continues with Mr Chetan's exploration of the stars and a science quiz based on the Axiom mission by Mr Gaurishankar, inviting readers to engage interactively with the wonders of space.

Finally, the reports from the VSF events provide a glimpse into the vibrant community and ongoing activities that sustain and promote science.

We are very grateful to our contributors for sharing a piece of their expertise and the overall efforts and support of the editorial team, without whom none of this would be worth the quality time of our readers.

Editorial Team



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Science Tourism: An Overview

Dr Lalit Sharma

Introduction

India is globally admired for its cultural depth and historical grandeur. Yet, an equally significant facet, its scientific heritage, remains underexplored. From ancient observatories and stepwells to metallurgical marvels and water management systems, the subcontinent abounds with examples of scientific brilliance that have shaped civilizations. Science Tourism, as a concept and practice, seeks to rediscover and celebrate this legacy. It offers not just sightseeing, but an immersive journey into the continuity of knowledge, where science, heritage, and society meet.

The Concept of Science Tourism

Traditional tourism usually revolves around culture, history, adventure, or recreation. Science Tourism, however, is distinct: it is tourism for science. It provides travellers, especially students and curious minds, opportunities to engage with the scientific spirit of India across ages. By connecting classroom concepts with real-world examples, it enhances STEM education, instils curiosity, and fosters scientific temper. Globally recognized as an emerging field, Science Tourism enriches leisure with inquiry, reflection, and hands-on experiences.

Why Science Tourism Matters

The importance of Science Tourism extends across multiple dimensions:

- Educational Value: Offers experiential learning beyond textbooks and inspires inquiry-based thinking.

- Cultural Continuity: Highlights India's scientific contributions from Vedic mathematics and Ayurveda to space exploration.
- Sustainable Development: Promotes awareness of traditional practices in water management, energy conservation, and ecological balance.
- Economic Potential: Diversifies tourism, generates income, and supports local communities.
- Societal Impact: Encourages scientific temper, critical inquiry, and innovation, aligning with the vision of *Viksit Bharat @ 2047*.

Science Tourism reinforces the idea that science is not confined to laboratories but is woven into our landscapes, monuments, and traditions.

Dimensions of Science Tourism in India

Science Tourism in India spans a wide spectrum of sites and experiences:

- Archaeological and Historical Landmarks:

The Iron Pillar of Delhi – an enduring example of ancient, corrosion-resistant metallurgy.

Stepwells of Gujarat and Rajasthan – showcasing traditional hydrological engineering.

- Astronomical Heritage:

The Jantar Mantar observatories in Jaipur, Delhi, Ujjain, and Varanasi – remarkable for their precision and architectural ingenuity.

•Scientific Institutions and Museums:

Modern hubs like IISc, CSIR laboratories, and ISRO Visitor Centres highlight India's cutting-edge research.

Science museums and science cities (e.g., Kolkata Science City) offer interactive learning platforms.

•Acoustic and Optical Marvels:

The whispering gallery of Gol Gumbaz in Bijapur demonstrates acoustic science.

Monuments and temples across India display optical illusions blending art with physics.

•Timekeeping and Calendrical Knowledge:

Ancient sundials and observatories reveal indigenous methods of tracking celestial movements.

•Architecture as Science:

Traditional Indian structures reflect principles of ventilation, lighting, and acoustics, where art and science merge seamlessly.

Each of these sites narrates how communities across eras solved real-world challenges, from predicting monsoons and conserving water to measuring time and exploring the cosmos.

Towards a Culture of Scientific Travel

Science Tourism is more than visiting monuments or institutions; it is about awakening curiosity and celebrating the human quest for knowledge.

Its promotion supports national initiatives like [NEP 2020](#) and [Dekho Apna Desh](#), while cultivating pride in India's scientific legacy. Curated Science Tourism circuits linking heritage sites, research centres, and museums can make such travel accessible and impactful.

By nurturing partnerships among academia, government, civil society, and tourism sectors, India can position itself as a global hub for Science Tourism.

WATCH FULL VIDEO HERE !!



Conclusion

Science Tourism transforms travel into a voyage of discovery. It enables us to honour India's scientific past, engage with its present, and inspire the future. The next time we embark on a journey, let it be an opportunity not only to admire beauty and history, but also to rediscover the scientific spirit embedded in our heritage.

Bon Voyage into the world of Science Tourism!

Science Tourism in J&K -

Unlocking Potential and Ensuring Sustainability

Dr Wahied Khawar Balwan



Jammu and Kashmir, a region celebrated for its unparalleled natural beauty, possesses a significant yet largely untapped potential for science tourism. This report details the diverse scientific assets available, encompassing unique geological formations, rich biodiversity, historically significant archaeological sites, and the public engagement efforts of academic and research institutions.

Despite these inherent strengths, the region faces considerable challenges in translating this scientific wealth into a robust tourism sector, primarily due to fragmented public access information, inadequate on-site interpretation, and the pressing need for sustainable management practices amidst a growing tourism influx. Strategic development of science tourism requires a multi-faceted approach.

Key recommendations include the formulation of a dedicated science tourism policy, substantial investment in modern interpretive infrastructure and digital platforms, comprehensive capacity building for specialized guides and local communities, and targeted marketing campaigns.

Furthermore, an unwavering commitment to integrating sustainable practices and conservation measures is paramount to ensure that the development of science tourism contributes positively to both the regional economy and the long-term preservation of its invaluable natural and cultural heritage.

Science Tourism: Introduction

Science Tourism represents a specialized form of travel focused on engaging with scientific concepts, research, and natural phenomena. It involves responsible visitation to sites of scientific interest, aiming to enhance visitors' understanding of scientific principles, foster scientific literacy, and often support ongoing conservation or research endeavours.

This broad category encompasses diverse fields such as geology, astronomy, ecology, archaeology, and applied sciences. The importance of science tourism is growing globally as a niche market that offers significant educational value, promotes local economies, and cultivates a deeper appreciation for both scientific heritage and environmental stewardship.

The very nature of science tourism implies an educational and often conservation-oriented component, setting it apart from general sightseeing.

This means that merely possessing sites of scientific interest is insufficient; these locations must be thoughtfully interpreted and made accessible in a scientific context for tourists to truly engage with their inherent value.

The transformation from a passive viewing experience to an active learning opportunity is central to developing a thriving science tourism sector.

J&K's Unique Scientific and Natural Heritage

Jammu and Kashmir, frequently lauded as "Paradise on Earth", is globally recognized for its breathtaking landscapes, serene lakes, and majestic mountains. Beyond this renowned scenic beauty, the region harbours a rich, yet largely underexplored, scientific heritage. This heritage spans a remarkable range, from ancient geological formations that tell the story of Earth's deep past to modern biodiversity hotspots teeming with unique flora and fauna.

The region's distinctive geographical position within the Western Himalayas has given rise to a mosaic of unique ecosystems and geological structures. This makes Jammu and Kashmir a natural laboratory for scientific inquiry and, consequently, a compelling destination for science tourism. The existing reputation of Jammu and Kashmir as a natural beauty destination provides a strong foundational appeal. The challenge lies in layering compelling scientific narratives onto this established allure, thereby transforming passive appreciation of the scenery into active scientific engagement.

This necessitates a strategic shift in both marketing approaches and interpretive methodologies to highlight the scientific wonders embedded within the landscape.

Pillars of Science Tourism in J&K: Existing Assets and Potential

Jammu and Kashmir is endowed with a diverse array of scientific assets that offer substantial potential for the development of a specialized science tourism sector. These assets span museums and observatories, significant geological sites, rich biodiversity hotspots, and historical and archaeological locations with profound scientific relevance, complemented by the public engagement efforts of academic and research institutions.

Science Museums and Observatories

1. G.G.M. Science College Jammu Museums (Zoology, Geology)

The Government Gandhi Memorial (G.G.M.) Science College in Jammu is home to two notable museums: a Zoology Museum and the Dr. D.N. Wadia Museum of Geology. The Zoology Museum features a comprehensive collection of non-chordate and chordate animal specimens, stuffed birds, and intricate clay models illustrating evolutionary processes, alongside various bone skeletons. This collection primarily serves as an educational aid for graduate and postgraduate students and a valuable resource for researchers. The Dr. D.N. Wadia Museum of Geology, named after its founder, holds distinction as one of India's finest and second oldest geology museums. Its exhibits include rare specimens of minerals, rocks, and fossils collected from within the state, across India, and internationally. A prominent display is a remarkably long fossilized tusk of Stegodon ganesa, an extinct relative of ancient elephants. These museums possess significant scientific collections that are currently utilized predominantly for academic purposes. Their historical significance, particularly that of the geology museum as one of the oldest in India, adds a valuable heritage dimension.



However, a notable barrier to their broader appeal as science tourism attractions is the lack of clear public access information, including operating hours and entry fees. This absence of readily available visitor

details indicates a substantial untapped potential. Formalizing public access with guided tours and engaging interpretive displays could transform these academic resources into key destinations for geology and natural history enthusiasts.

2. Srinagar Science Centre:

Jammu and Kashmir is home to a "Srinagar Science Centre (Category-II)," which operates under the Scheme for Promotion of Culture of Science (SPoCS). This center is part of the National Council of Science Museums (NCSM), an autonomous organization overseen by the Ministry of Culture, Government of India. The NCSM's overarching objective is to cultivate a culture of science, technology, and innovation, and to foster scientific temper within society through its network of science cities, centers, exhibitions, and various outreach programs.



While the existence of the Srinagar Science Centre is confirmed and it is recognized as part of a national network, specific details crucial for public visitation, such as its precise address, contact information, operating hours, entry fees, and a comprehensive list of its exhibits, are not readily available in the provided information. This significant lack of accessible public information poses a considerable impediment to the center's effectiveness as a science tourism destination. The discrepancy between its confirmed establishment and the absence of

clear public-facing operational details points to a substantial deficiency in its operational transparency and marketing efforts, hindering its ability to attract and serve a broader audience interested in science.

Geological Wonders and Geo-Heritage Sites

1. Dal Lake's Geological Significance:

Dal Lake, a prominent Himalayan urban lake in Srinagar, is central to Kashmir's tourism industry. Its geological origins are a subject of ongoing debate among geologists, with theories proposing it as either the remnants of a post-glacial lake or a fluvial formation from an ancient flood spill channel or oxbows of the Jhelum River. The surrounding region exhibits a diverse array of rock types, including igneous, metamorphic, and sedimentary formations, and is situated in Zone V of India's Seismic Zoning Map, indicating a high level of seismic activity.

The geological history of Dal Lake, coupled with its ongoing ecological challenges such as eutrophication, pollution, and invasive weed growth, presents significant opportunities for both geo-tourism and conservation-focused science tourism.



Despite these compelling narratives, there are no explicit public interpretive centers or guided tours specifically dedicated to explaining its geological features.

This void in scientific interpretation prevents visitors from gaining a deeper understanding beyond the lake's aesthetic appeal. The existence of initiatives like the "Save Dal Lake Campaign" offers a direct avenue for conservation tourism, allowing visitors to engage with the scientific efforts aimed at restoring the lake's ecological health. This transforms an environmental challenge into an educational and participatory tourism experience.

2. Pahalgam's Panjal Traps and Rock Formations:

Pahalgam is home to the early Permian Panjal traps, which consist of mafic and silicic volcanic rocks formed during the opening of the Neo-Tethys Ocean. These sites showcase impressive geological features, including distinctive columnar joints and pillow lava formations, which are critical for understanding the processes of magma transport and the broader evolution of the Neo Tethys Ocean. The region's geological significance has led to its recognition for "Geo heritage" potential.



The geological features in Pahalgam are not merely interesting; they hold global scientific significance, making them prime candidates for specialized geo-tourism. The absence of explicit public interpretive centers or guided tours focused on these geological wonders represents a substantial missed opportunity. Developing such infrastructure and offering expert-led tours,

perhaps drawing inspiration from established geology tour models, could attract a specialized segment of scientific tourists and researchers, thereby leveraging this world-class geo-heritage for educational and economic benefit.

3. Sonamarg's Fragile Himalayan Geology:

Sonamarg's landscape is characterized by its "fragile Himalayan Geology". A notable development in the region is the construction of the 6.5-kilometer-long Z-Morph Tunnel, built using the New Austrian Tunnelling Method (NATM).



This engineering feat stands as a testament to overcoming significant geological challenges to provide all-weather connectivity, bypassing avalanche-prone routes. The tunnel itself, and the engineering principles behind its construction in such a demanding geological environment, present a unique opportunity for "engineering geology tourism." Visitors could learn about the scientific principles and technological innovations employed to navigate and stabilize fragile mountain terrain. This specific niche could be seamlessly integrated with the existing eco-tourism initiatives in Sonamarg, offering a blend of natural beauty appreciation with an understanding of human ingenuity in adapting to and managing complex geological landscapes.

Biodiversity Hotspots and Ecological Significance

1. National Parks and Wildlife Sanctuaries:

Jammu and Kashmir is rich in biodiversity, hosting several critical hotspots and protected areas. These include Dachigam National Park, renowned for being home to the critically endangered Hangul deer (Kashmir stag), and Hemis National Park, particularly famous for sightings of the elusive snow leopard.



Other significant areas include the Gulmarg Biosphere Reserve, where musk deer and brown bears can be found, and the Over-Aru Wildlife Sanctuary. These parks currently offer opportunities for wildlife safaris, nature walks, bird watching, and photography tours. These areas serve as a foundational element for ecology-focused science tourism, directly linking to fields such as wildlife biology, conservation science, and ecosystem studies. While general wildlife tours are available, enhancing these experiences with expert naturalist guides who can articulate ecological processes, species behaviour, and conservation challenges would elevate them to genuine "ecology science tourism." Replicating models such as the Nature Interpretation Centre found in Ladakh could provide structured educational components, deepening visitors' understanding of the region's unique ecological tapestry.

2. Wetlands (Dal Lake, Wular Lake, Manasbal Lake):

The wetlands of Jammu and Kashmir, including Dal Lake, Wular Lake, and Manasbal Lake, are vital ecological assets, particularly for bird migration. These areas attract over 200 species of birds, such as Bar-headed Geese, Northern Pintails, Teals, Ducks, and Herons. Dal Lake and Wular Lake are recognized under the Ramsar Convention, underscoring their international ecological significance.

Despite their importance, these wetlands face severe environmental degradation from pollution, untreated sewage, and the proliferation of invasive weed growth. This ecological crisis, while challenging, presents a unique opportunity for "conservation science tourism" or "citizen science tourism." Visitors could engage directly with the scientific understanding of wetland ecology, the threats they face, and the ongoing scientific efforts for their restoration, such as the "Save Dal Lake Campaign". This approach transforms an environmental problem into an educational and participatory tourism experience, fostering a sense of responsibility among visitors.



3. Jawaharlal Nehru Memorial Botanical Garden, Srinagar:

The Jawaharlal Nehru Memorial Botanical Garden in Srinagar, established in 1969, is a significant botanical asset. It boasts an extensive collection of approximately 150,000 ornamental plants, a large variety of oak species, and rare Kashmiri tropical plants. The garden is structured into four main divisions: the Plant Introduction Centre, the Research Section, the Recreational Garden, and the Botanical Garden itself. This botanical garden is an existing resource with considerable potential for botanical and horticultural science tourism.



While it already attracts general visitors, there is a clear opportunity to develop specific public programs or guided tours that highlight the scientific work conducted by the "Plant Introduction Centre" and the "Research Section." Such programs could focus on plant diversity, conservation strategies for local flora, and the scientific processes involved in plant adaptation and cultivation, thereby appealing to a more science-interested audience.

Opportunities for Developing Science Tourism

Jammu and Kashmir stands at a pivotal juncture where its rich scientific and natural heritage can be strategically leveraged to develop a thriving science tourism sector. This development hinges on enhancing interpretive experiences, creating thematic

tourism routes, promoting science popularization events, and integrating scientific narratives into existing eco-tourism initiatives.



A fundamental step in developing science tourism involves transforming passive visitation into active, educational engagement through improved interpretation. Within biodiversity sites, establishing nature interpretation centers within or near national parks and wildlife sanctuaries, such as Dachigam and Gulmarg, would be highly beneficial. A successful model for this can be observed in Ladakh. These centers could feature exhibits on local flora, fauna, intricate ecosystems, and ongoing conservation efforts, thereby significantly enhancing visitors' understanding during wildlife safaris and nature walks.

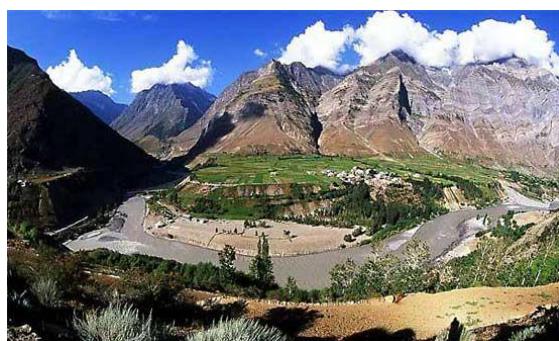
Creating coherent thematic routes can significantly enrich the visitor experience and encourage longer stays, moving beyond isolated site visits to a more holistic exploration of the region's scientific facets. Leveraging and expanding existing science popularization events can significantly boost science tourism and engage local communities. National Science Day (February 28th) presents an opportunity to extend celebrations beyond academic institutions. Public science exhibitions, fairs, and interactive workshops could be organized across major tourist hubs.

Encouraging "One Day as a Scientist" experiences for both students and tourists could foster deeper engagement.

Integrating stronger scientific narratives into existing eco-tourism initiatives can both enrich the visitor experience and reinforce Jammu and Kashmir's commitment to responsible and sustainable tourism. Existing eco-tourism packages can be deepened by incorporating more detailed scientific narratives on ecology, biodiversity, and conservation. Training local guides to become "naturalist guides" who can explain the scientific significance of local flora, fauna, and ecosystems is a crucial step. Despite its significant potential, the development of science tourism in Jammu and Kashmir faces several critical challenges that must be addressed to ensure its sustainable growth and long-term viability.

A major impediment to science tourism in Jammu and Kashmir is the pervasive lack of centralized and comprehensive public information. There is an absence of a single, reliable source (such as dedicated websites or brochures) providing essential details for science tourism sites, including accurate operating hours, entry fees, and tour availability. Furthermore, many listed "science museums" in general searches are not actually located within Jammu and Kashmir, adding to visitor confusion.

Jammu and Kashmir is currently experiencing an "unprecedented tourism boom," which, while economically beneficial, is simultaneously placing "mounting ecological stress" on its "fragile mountain ecosystems".



This presents a crucial contradiction: the very natural assets that form the foundation of science tourism are being degraded by the current tourism model. Specific environmental impacts are evident across the region. Popular tourist destinations and ecologically significant wetlands, such as Dal Lake and Wular Lake, are showing alarming signs of decline due to plastic waste, discarded food wrappers, untreated sewage, and nutrient overload. Unplanned growth in areas like Sonamarg, Pahalgam, and Gulmarg has resulted in "rapid concrete expansion," deforestation, and contamination of rivers.



Developing science tourism without implementing robust sustainability measures would only exacerbate these existing problems, potentially leading to irreversible environmental damage. This would undermine the long-term viability of not only science tourism but also the broader tourism sector in the region. Therefore, a commitment to sustainability is not merely a recommendation but an ethical and practical imperative for any future tourism development.

To effectively harness Jammu and Kashmir's potential as a premier science tourism destination, a strategic, coordinated, and sustainable approach is essential.

Conclusion

Jammu and Kashmir possesses an immense, yet largely unrealized, potential to emerge as a premier destination for science tourism. The region's unique geological formations, rich biodiversity, significant archaeological sites, and the outreach efforts of its academic institutions offer a compelling foundation for this specialized sector. However, unlocking this potential demands a strategic, coordinated approach. This includes the formulation of a dedicated science tourism policy to provide clear direction, substantial investment in modern interpretive infrastructure and digital platforms to enhance visitor engagement, and comprehensive capacity building initiatives to train specialized guides and empower local communities. Concurrently, targeted marketing campaigns are necessary to reach the discerning science tourism market. Crucially, an unwavering commitment to integrating sustainable practices and robust

conservation measures is paramount. Without these, the growth of tourism risks degrading the very natural and cultural assets that underpin its appeal. By embracing science tourism responsibly, Jammu and Kashmir cannot only diversify its economy and attract a new segment of visitors but also foster scientific literacy, promote environmental conservation, and ensure the long-term preservation of its invaluable natural and cultural heritage. The development of science tourism can thus serve as a model for responsible growth, transforming existing challenges into opportunities for a more enlightened and sustainable future for Jammu and Kashmir.

“Any Error in this manuscript is silent testimony of the fact that it was a human effort”

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The Textile Tourism in India

Dr Meena Sharma

Textiles in India are more than mere fabrics; they are chronicles woven with the threads of culture, art, science, history, geography, and innovation. For centuries, Indian weavers, dyers, and artisans have perfected the art of blending aesthetics with functionality. Cotton, silk, wool, and natural dyes not only clothed generations but also carried India's fame across continents, making it one of the earliest hubs of global trade. From the cotton fields of the Indus Valley to the silk routes of medieval kingdoms, India's textile heritage has shaped trade, traditions, and even global fashion. The interplay of natural dyes, diverse weaving techniques, and climate-responsive designs highlights not only India's artistry but also its deep scientific understanding of environment and sustainability.

The story of Indian textiles is not just limited to fashion, it is also about understanding the science of materials, the adaptation to local climates, and the sustainable practices that continue to inspire the world today.

Cotton and the Roots of Indian Textile Heritage

India is often credited as the birthplace of cotton cultivation and weaving. India's tryst with cotton began more than 5,000 years ago in the Indus Valley Civilization. Archaeological findings at Mohenjo-Daro and Harappa reveal spindle whorls and cotton fragments, suggesting that the subcontinent was among the first to cultivate and weave cotton. Greek historians like Herodotus described Indian

cotton as "a wool more beautiful than that of sheep," and by the 1st millennium BCE, cotton textiles had become India's prized export.

Cotton, being light, breathable, and absorbent, became the perfect fabric for the hot and humid climate of much of the Indian subcontinent.

The invention of the charkha (spinning wheel) and the mastery of weaving techniques enabled the creation of fine cotton muslin—famously described as "woven air" by travellers. The muslin of Bengal and the calico of Gujarat became prized exports, carried by traders along the Silk Route and maritime trade networks.



Dyes: The Science of Colour in Cloth

India's contribution to natural dyeing techniques is unparalleled. The vibrancy of Indian textiles has always come from natural dyes. Indigo from the plant *Indigofera tinctoria* gave the world its iconic blue. Red hues were extracted from madder roots and lac insects, while turmeric

and pomegranate rinds offered brilliant yellows. These dyes were not only aesthetic but also eco-friendly and sometimes had antimicrobial properties.

From indigo of the Gangetic plains to madder red of Rajasthan, and turmeric yellow of southern India, each region specialized in extracting vibrant, lasting colours from nature.

- Indigo (Blue): Known as “Blue Gold,” indigo dye was cultivated in Bengal and Bihar. Its deep blue hues were admired globally and remained a staple in textile exports.
- Madder and Lac (Red): The roots of madder plants and secretions of lac insects gave brilliant reds, commonly used in Rajasthan and Gujarat.
- Turmeric and Saffron (Yellow): Apart from being culinary ingredients, turmeric and saffron produced earthy yellows and golds in fabrics, often symbolizing purity and sanctity.
- Pomegranate Rind, Myrobalan, and Iron (Black): Black dyeing was common in central India, using a combination of tannin-rich plant material and iron salts.

The dyeing processes themselves revealed advanced chemical understanding, use of mordants like alum or cow’s urine fixed the colours, ensuring longevity and brilliance even after repeated washing.

Did You Know - The famous “Blue Revolution” of indigo once made Bengal a global hub, with European merchants competing to control its trade.

Evolution of Regional Textiles: A Climatic and Cultural Journey

1. North India: Wool and Warmth

In the cold climates of Kashmir and Himachal, wool became the natural choice. The Kashmiri pashmina shawls, woven from the under-fleece of Himalayan goats, became legendary for their warmth and softness. Wool carpets, namdas (felted rugs), and embroidered phirans reflected both necessity and artistry. Meanwhile, Punjab’s phulkari embroidery added floral vibrancy to cotton fabrics, making them both functional and ornamental.



Pashmina



Phulkari

2. Western India: Bright Colours for Arid Landscapes

Rajasthan and Gujarat, with their dry and arid climates, gave rise to lightweight cotton textiles dyed in vibrant colours to counter the dullness of the sandy landscape. Tie-dye traditions like Bandhani and block-printing centres like Ajrakhpur showcase this heritage. These bright colours not only contrasted the desert landscape but reflected cultural exuberance. The loose draped garments (ghagras, odhnis, turbans) suited the hot, dry weather, providing comfort while protecting from dust.

Did You Know -The tiny mirror work (shisha embroidery) of Gujarat was originally believed to ward off evil spirits by reflecting them away.



Bandhani



Arjapur Block Printing



Glass-work / Embroidery

3. Eastern India: Fine Muslins and Silks

Bihar and West Bengal, blessed with humid climate and riverine plains, produced the famous Dhaka muslin, a fabric so fine it could pass through a ring. The region also became known for Baluchari silk saris, woven with mythological motifs. Silk's natural thermoregulating quality made it suitable for the fluctuating weather of the

east. The perfected tussar and mulberry silks from these and nearby regions remain prized for their texture. Each silk variety suited the humid climate, where light yet rich fabrics were preferred.



Muslin



Baluchari silk



Tussar silk

4. Southern India: Sturdy Cotton and Silks

The Deccan and Tamil regions, with hot, humid climates, favoured cotton weaves like Madras checks and lungis, known for breathability. Simultaneously, South India became a hub of silk production, with Kanjeevaram or Kanchipuram silks standing out for their durability and grandeur, with intricate zari borders, often worn during ceremonies. The mulberry silk thrived in the climate of Karnataka, making Mysore another silk hub. Kerala, with its hot and humid climate, popularized mundu

and kasavu textiles, white cotton with golden borders that kept the body cool. Andhra Pradesh's ikat weaving showcased mathematical precision in dyeing and design.



Madras Checks



Kanjeevaram silk



Kasavu Mundu

5. Central India: Tribal Textiles and Natural Fibers

Madhya Pradesh and Chhattisgarh developed unique handloom traditions like Maheshwari and Chanderi, combining cotton and silk to suit the transitional climate. Tribal communities used natural fibres like hemp and wild silks (tussar, eri) that were not only sustainable but perfectly adapted to local needs.



Maheshwari



Chanderi silk

6. North-East India: Rain-Resistant and Cultural Richness

In the lush, high-rainfall northeast, weaving is an integral cultural practice. Assam's Muga silk famed for its golden hue and resilience reflects both luxury and adaptation to local weather. Cotton weaving in Nagaland and Manipur incorporates bold motifs, with textiles doubling as cultural identifiers as well as functional clothing.



Muga silk



Manipuri cotton

Suitability of Textiles to Climate: Science Behind the Choices

The evolution of India's textile diversity was not accidental but deeply linked to climatic suitability:

- Cotton: Lightweight, breathable, perfect for hot, humid plains.
- Wool and Pashmina: Insulating, ideal for the Himalayan cold.
- Silk: Thermoregulating, comfortable in both warm and cool climates.
- Blended Fabrics (Cotton-Silk): Adaptable for transitional regions with varying temperatures.

Ancient artisans displayed an intuitive grasp of material science, choosing fibres and dyeing methods that best suited their environments while maintaining aesthetic and cultural depth.

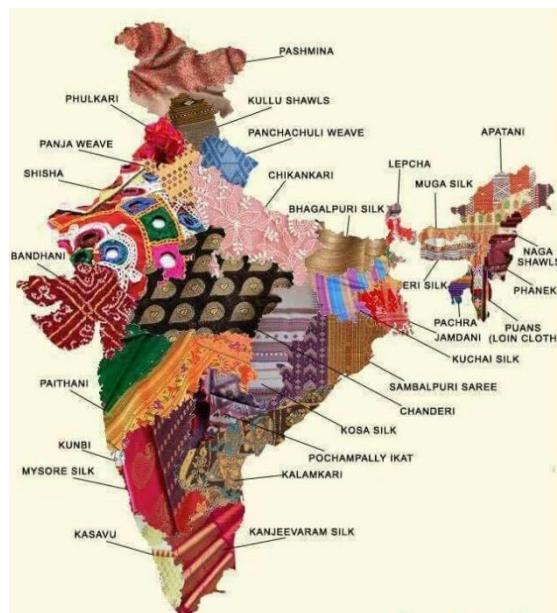
Textile Museums in India: Preserving Heritage

To truly appreciate India's textile legacy, one can explore museums dedicated to textiles and handlooms that serve as living archives of this heritage:

- Calico Museum of Textiles (Ahmedabad, Gujarat): One of the world's most celebrated textile museums, showcasing centuries of Indian weaving, embroidery, and dyeing traditions.
- Indian Museum (Kolkata): Houses exquisite collections of ancient cotton and silk fabrics, including samples of Bengal muslins.
- National Handicrafts and Handlooms Museum (New Delhi): Popularly known as the Crafts Museum, it displays diverse regional textile traditions alongside tools used by artisans.
- Textile Gallery at Chhatrapati Shivaji Maharaj Vastu Sangrahalaya (Mumbai): Features historic textiles from Maharashtra and beyond.
- Indira Gandhi Rashtriya Manav Sangrahalaya (Bhopal): Highlights tribal

and folk textile traditions, including natural dye practices.

These museums not only preserve heritage but also function as centres for science tourism, where visitors can learn about the chemistry of dyes, the mechanics of looms, and the interplay between environment and fabric.



Fabric Map of India

The textile heritage of India is not just about fabric—it is a living narrative of geography, science, sustainability, and identity. From the fine muslins of Bengal to the rugged wool of Kashmir, from the indigo-dyed cottons of Gujarat to the golden silks of Assam, each weave carries within it the wisdom of centuries.

As the world looks toward sustainable and climate-conscious fashion, India's ancient practices, natural dyes, handlooms, region-specific fibres offer timeless lessons. Exploring India's textiles is therefore not merely a journey into its past, but an exploration of how art, science, and ecology were seamlessly woven together in fabric that clothed civilizations and carried culture across continents, where every thread tells a story of rich heritage.

Dr Meena Sharma has undertaken extensive research work on textiles as a part of her PhD.

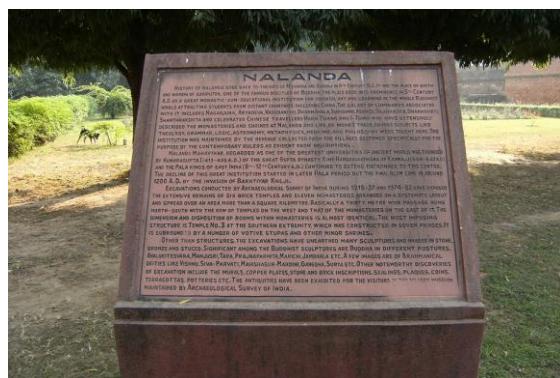
Nalanda Mahavihara: An ancient Gyan Kendra

Dr Kumari Nimisha

Going by the old saying that the Present is the key to the past, our ancient monuments are physical evidence of past glories. Bihar holds a rich educational and cultural heritage. One of them is Nalanda Mahavihara.

Nalanda is not only historically significant, its place in the world of Buddhism and Indian education cannot be ignored. It is a must visit destination from the viewpoint of exploring ancient past.

Nalanda university was the first international residential university in the world, most known as 'Mahavihara'. Here it is very interesting to pause and think why Nalanda achieved so much name and fame, where many monasteries were there in all over India.



Nalanda mahavihara was the Gyan Kendra. It was an excellent and dedicated centre of learning and the home for learned monks and teachers. Most renowned of them were Nagarjuna, Aryabhatta, Dharmkirti, Vasubandhu, Santarakshita, Shilabhadra, Dharmapala, Chandrapala, Gunmati and Sthiramati.

The first International University was established in fourth century, (somewhere it has been said as fifth century) by Gupta Rajvansh. Nalanda university witnessed its golden era and reached the peak of its development and prosperity between fifth century to thirteenth century. It was a large Buddhist monastery and served as a major centre of learning.

The history goes back to the time of Buddha, so it is also named as 'Nalanda Mahavihara'. It is said that it was founded by Emperor 'Kumar Gupta'. It is believed that during its peak days, there were about 2000 teachers and 10,000 students.

The famous Chinese traveller Huen-Tsang was a student at this university and has written the details about the university. According to him the process of enrolment in university was very rigorous. Entrance to the university was strictly regulated and aspiring students had to engage in intellectual debate and recursive argument method with dwarpala. Only if dwarpala was satisfied with the student's knowledge and reasoning, they would be granted admission. The different subjects taught there were Buddhist scripture (Mahayana and Heenyaan), Philosophy, Astronomy, Medicine, Metaphysics and Logic.

Scholars from distant places like Korea, China, Japan, Mongolia, Sri Lanka, Tibet and South Asia usually came to study here.

How was the learning at Nalanda, its ambience as well as the profound knowledge of teachers, we get all the records and details from those scholars.



The ruins of this learning centre were first rediscovered by Scottish surveyor Francis Buchanan Hamilton in the beginning of nineteenth century. Later, it was officially identified as the ancient university by Sir Alexander Cunningham. In 20th century, Archaeological Survey of India excavated this site and took the responsibility of its revival and restoration.

Nalanda mahavihara

It is located about 100 kilometer southeast of Patna in the Nalanda district of Bihar. The travel time is about two hours from Patna. The Nalanda archaeological site is spread to the west of Bargaon village and in between the man-made lakes of Gidhi, Panashokar and Indrapuskarni

Nalanda was close to Rajgriha (modern Rajgir) the First Capital of Magadh. Rajgrih has a special role in Buddha's life. Buddha's first chief disciple Sariputra was from Nalanda, and he was associated with organising Buddha's teaching systematically. Sariputra achieved his nirvana at Nalanda. In his honour, the Mauryan emperor Ashoka built a stupa at Nalanda. He also Constructed vihara for the Buddhist monks, which evolved into Nalanda Mahavihara in centuries. It had a well laid out plan with multiple rectangular monasteries, a walled large infrastructure.

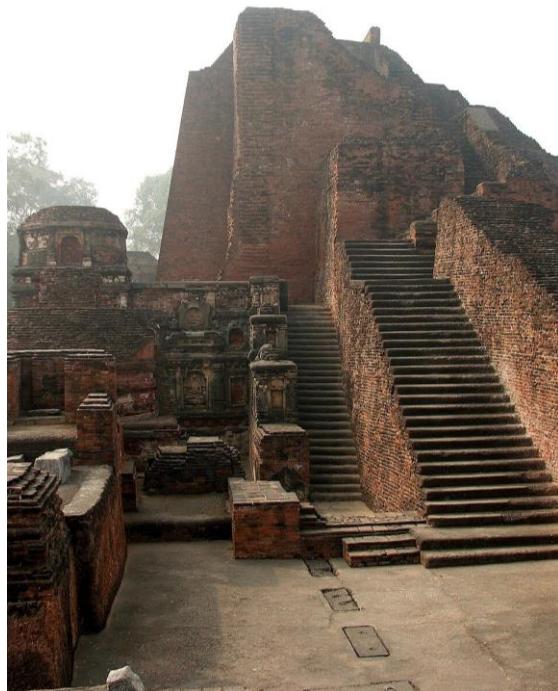
Aryabhatta, regarded as the “father of Indian Mathematics” was also at Nalanda Mahavihara in the sixth century CE.

Huen-Tsang and Yijing from China are the two well-known foreign scholars who played a key role in preserving the glorious history of Nalanda. Huen-Tsang was a Chinese monk, came to India during the reign of Harshvardhan in 7th century. He stayed at Nalanda to closely experience the customs and way of life of the monks. He was the student and a teacher at Nalanda Mahavihara.

Nalanda Mahavihara was a large Buddhist monastery and served as a major centre of learning. It was a major Buddhist monastic university. There is no clear source of information about Nalanda in the past, rather there are scattered sayings. All these strings together give us some ideas and reflection. Ruins of Nalanda Mahavihara is spectacular to see. Spread over in 12 hectares, the ruined architecture reveals that it was built in a very well-planned manner with an excellent architecture. There were monasteries inside the campus. Thirteen monasteries have been found so far. The financial system depended on basic grains and income from the villages received as donations. At the centre of the complex, there is a a huge structure called as main stupa. It was the symbol of spiritual enlightenment. Around this, remains of ancient temples and monasteries can be seen. It is also said that inside the campus there were many temples and several monasteries, a vast library with millions of manuscripts, meditation hall, lecture halls.

The library was very rich and known as 'Dharmganja'. It had 3 parts- Ratnasagar Ratnadadi and Ratn ranjika. They were rich in texts and manuscripts. The Turkish invader Bakhtiyar Khilji, destroyed this University in 1200 A.D and it brought the

end of its seven centuries golden era. Some others claim about the natural decline of the University. Destruction was a significant cultural and intellectual loss but despite that, it remains a symbol of ancient India's intellectual achievement.



The ruins of shrines and viharas (Residential and Educational buildings) is spread over in 12 hectare is thrilling to see. Artistic walls, stone and metal works are worth to see. We can easily imagine about planning, architectural and artistic excellence of that time by seeing the "quadrangular vihara". Staircase suggests about multistorey buildings. The purpose of quadrangular layout might be to provide a cohesive environment. Its layout is along north-south axis. The structural remains have been well preserved, and the entire protected area is maintained by Archaeological Survey of India. This University is now a UNESCO World Heritage Site.



Late former president Dr. A.P.J. Abdul kalam gave the proposal for the revival of the university in 2006. Later, Nalanda University Act was passed in 2010 by Indian government, and the institution again came into existence in 2014 with the first batch. The students were admitted to the school of historical studies and school of environmental studies.

The new campus

The new sprawling campus is extended in about 455 acres at Rajgir, is close to the site of ruins of Nalanda. This campus is carbon footprint net zero campus and architecture, and design has been inspired from the original monasteries and buildings of the Nalanda Mahavihar. Inside the campus there is one Kamal Sagar Pond, old grid solar panel, water treatment and recycling plant. there is a vast green cover spread in many acres. Modern amenities like fully equipped Sports Complex, Auditorium, Yoga centre and Library are also a part of the university.



Other nearby visiting sites

Nalanda Archaeological Museum-It has a huge collection of manuscripts, artefacts and remnants from the site.

Huen-Tsang Memorial Hall- Dedicated to the famous Chinese traveller and Scholar of Nalanda Mahavihara.

Nav Nalanda Mahavira- Located on the South bank of the Indrapushkarni lake, the new Nav Nalanda Mahavihara is an institute for Pali and Buddhist studies.

Contributions of ancient Gyan Kendra

1. The bronze art of Nalanda had an impact on the art of East, South and South-East Asian Countries.
2. The development of the quadrangular vihara in the field of architecture.
3. The idea of making three dimensional mandalas. (Ex-Kesariya Buddhist Stupa in Bihar)

4. Enrichment of Sanskrit language by composing their works in Sanskrit.

5. The great tradition of translation contributed to the enrichment of languages.

6. Contributed to the development of new poetic forms like doha, chaupai and paddhari.

7. The World's first printed book "The Diamond Sutra" is believed to be written by Nagarjuna at Nalanda.

8. The Rasaratnahara composed by Nagarjuna is considered the first treatise on Indian Alchemy.

There can be many more but let us be inspired by the legacy of ancient scholars to uphold the values of learning, compassion and humility.

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Science Tourism by Students

Class V students, APS Damana, Jammu

Science Tourism: Highlights of Key Locations

Namish Mengi



Science tourism means traveling to visit places connected with science. It includes museums, observatories, laboratories, and universities where people can explore scientific achievements and research.

Science Tourism in India

India is becoming an important destination for science tourism. Apart from religious, eco, or adventure tourism, science tourism is now growing and attracting people interested in learning about astronomy, space research, and modern scientific facilities.

Key Locations and Attractions

1. Ladakh and Jammu & Kashmir
 - Home to the Indian Astronomical Observatory (IAA).
 - Houses advanced telescopes like the Himalayan Chandra Telescope.
 - Offers unique opportunities for astronomical research.
2. Observatories and Research Facilities
 - The Major Atmospheric Cerenkov Experiment Telescope (MACE).
 - The GROWTH – India telescope, India's first fully robotic research telescope.
3. Research Institutes

Institutes like IAA allow visitors to learn about space and astronomy research.

Benefits of Science Tourism

- Economic growth: Just like other types of tourism, it boosts local economies.
- Cultural exchange: Encourages interaction between tourists and local communities.
- Awareness: Promotes understanding of India's scientific progress.
- Preservation of traditions: Helps support local art, crafts, and culture.

How to Experience Science Tourism?

- Visit Observatories: Tourists can explore high-altitude observatories in Ladakh.
- Explore Institutes: Learn about ongoing research through public programs.
- Stay Updated: New scientific projects and facilities are developing rapidly, offering fresh opportunities for visitors.



Science Tourism: Adventures of the Curious Traveler

Reyansh Bali

Though some people journey to other countries strictly for a vacation, many seek adventure and sightseeing, allowing them to explore the various cultures, languages, culinary delights, and traditions that these lands and places have to offer. Yet even beyond that, there is a special kind of adventure that opens up the universe to the traveler: science tourism.

Science Tourism in India

India, as a land of knowledge and technology of ancient and modern times, has a number of destinations offering science tourism in the country. Some of these destinations are:

- **Centers of ISRO/Space Museum/Space Tourism Center:** ISRO is a place where national missions have inspired many generations. The Space Museum in Hyderabad, which is planned for opening, and prospective visits for space tourism at Sriharikota are experiences in harmony with scientific knowledge and adventure.
- **Bhabha Atomic Research Centre, Mumbai:** Nuclear science and atomic research is the pioneering scientific work of India. The Bhabha Atomic Research Centre in Mumbai is one of the foremost nuclear research centers in India.
- **Birla Planetariums (Kolkata, Hyderabad, Chennai):** Serving as centers of science tourism, the planetariums are gateways to the universe. These are famous for busting the dusty old lies and giving rise to a good part of the Indian generation.



- **Science Parks and Museums (National Science Centre, Delhi; Nehru Science Centre, Mumbai):** Science centers in different states of India, regional (Neck), have brought technical and scientific advancement to close proximity for the Indian general public.
- **Site-specific phenomena that are manifestations of geological processes:** Fossil parks in Dindori, Bagh, Mandu, and Kachchh; Salt encrustation in the Rann of Kachchh, Barren Island Lava

Global Science Tourism Destinations

However, these destinations might not attract visitors offering science tourism. Some international destinations offering science tourism are:

- **CERN, Geneva, Switzerland:** The business end of the Large Hadron Collider, this part of CERN attracts thousands of visitors every year. Hence, guided tours are arranged for visitors.
- **NASA Kennedy Space Center, USA:** The most famous space destination offered under one roof.
- **Darwin Centre, London:** The world's most famous natural history expedition.

Science Tourism: Explore Beyond Boundaries

Vamika Singh

It means traveling to learn about science. People visit places like forests, deserts, mountains, space centers, or research stations to see and understand how nature and science work. Sometimes, they even help scientists in their work.

Types of Science Tourism

- Nature Tourism: Visiting forests, wildlife parks, waterfalls, deserts, or rainforests to learn about animals, plants, and the environment.
- Citizen Science: Tourists (ordinary people) help scientists by watching birds, counting animals, or studying the environment.
- Geo Tourism: Visiting mountains, rocks, caves, or other landforms to learn about the Earth.



Benefits of Science Tourism

- We learn new things in a fun way.
- It helps protect nature and animals.
- It makes people care more about saving the Earth.

Examples of Science Tourism

- Space Tourism: Visiting places like Kennedy Space Center to learn about rockets and space.
- Research Trips: Going on polar cruises where people learn and help scientists.
- Geoparks: Visiting parks that explain rocks, soil, and Earth's history.

Challenges of Science Tourism

- Many people don't know much about it.
- It is not always easy to make it interesting for everyone.
- Some people say they are interested but do not join such activities.

Conclusion

Science tourism is a fun way to mix travel and learning. It teaches us about science and nature while also helping us take care of our planet.

Science Tourism: An excitement

Vanya Rana

Science tourism is an exciting way to explore the rich scientific heritage and natural wonders. Visitors can explore places like the Indian Space Research Organisation (ISRO) in Bengaluru, where they can learn about space missions and satellite launches. The Nehru Science Centre in Mumbai offers interactive exhibits that make science fun for everyone.

In addition, the Jantar Mantar observatories in Jaipur and Delhi showcase ancient astronomical instruments used for studying celestial bodies. Nature lovers can visit the Sundarbans to learn about biodiversity and conservation efforts.



Science tourism not only educates but also inspires curiosity about the world. It helps people appreciate India's contributions to science and technology. By combining travel with learning, science tourism encourages families and students to engage with science in a hands-on way, making it a memorable experience for all ages.



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मेनार एवं खींचनः राजस्थान के उभरते परिस्थितिकी पर्यटन स्थल

सतीश कुमार शर्मा

राजस्थान में उदयपुर जिले की वल्लभनगर तहसील के मेनार गाँव के जलाशयों तथा पूर्व जोधपुर जिले एवं वर्तमान फलोदी जिले की फलोदी तहसील के खींचन गाँव के जलाशय ने अपनी एक विशेष पहचान बनाई है। खींचन को बाढ़े नेचुरल हिस्ट्री सोसायटी, बर्डलाइफ इंटरनेशनल आदि जैसी संस्थाओं ने 2004 में ही महत्वपूर्ण पक्षी स्थल (Important Bird Area i.e. IBA) के रूप में पहचाना था। खींचन में चूंकि कुर्जा हर साल सर्दी प्रारंभ होते ही पहुँचे हैं तथा सर्दी खत्म होकर गर्मी प्रारंभ होते ही प्रस्थान कर वापिस अपनी मातृभूमि लौट जाते हैं। खींचन में रोजाना सुबह कुर्जाओं को भोजन हेतु चुगा दिया जाता है। चुगा देने के समय पक्षियों का जो जमघट बनता है, देखने लायक होता है। चुगा चुगने के बाद पक्षी गाँव के बाहर जलाशय में पानी पीकर आस-पास के टीलों पर धूप सेकने हेतु फैल जाते हैं।

कुर्जा पश्चिमी राजस्थान में अनेक जलाशयों पर पहुँचते हैं लेकिन खींचन पर एक बहुत बड़ी संख्या पहुँचती है। इतना बड़ा समूह खाना खाने, पानी पीने, टीलों पर सुस्ताने व हवा में उड़ने पर एक अद्भुत नजारा पेश

करता है। भूमि व हवा, दोनों स्थितियों में दो पक्षियों की औसत दूरी काफी कम होती है। भले ही हवा में एक साथ बड़ी संख्या में पक्षी उड़ते हैं लेकिन ये आपस में नहीं टकराते। हाँ, कभी – कभी विद्युत के तारों से टकराकर पंख तुड़वा लेते हैं या अन्य शारीरिक नुकसान करवा बैठते हैं।



कुर्जा अवलोकन का यहाँ आनंद का कारण पक्षियों की वह बड़ी भीड़ है जो जब धरती या हवा में एक साथ दिखाई देती है तो देखने व फोटो खींचने का आनंद ही कुछ और होता है। कुर्जा के साथ कॉमन क्रेन को भी देखने का आनंद मिलता है। ये दोनों पक्षी अपनी आदतों एवं भोजन की प्राथमिकताओं में

काफी समानता रखते हैं अतः मिश्रित दल बनाकर रहते हुए देखे जा सकते हैं।

कुर्जा पक्षी पश्चिमी राजस्थान के लोकगीतों में भी स्थान रखते हैं। यहाँ की ही नहीं बल्कि राजस्थान के अनेक क्षेत्रों की महिलाओं के लोक गीतों में कुर्जा को प्राचीन काल से ही विशेष स्थान मिला है। शीतकालीन देशान्तर गमन का समय समीप आते ही कुर्जा आने की लोग बाट सी जोहने लगते हैं। सारी कुर्जा न तो एक साथ आती हैं और न एक साथ जाती हैं बल्कि इनके छोटे-बड़े दल कई दिन तक आते रहते हैं और कई दिन तक जाते रहते हैं। और फिर एक दिन ऐसा आता है कि अन्तिम पक्षी भी खींचन की धरती से विदा हो जाता है। आगमन एवं विदाई की उडानें रात्रि को होती हैं। एक ऐसी सुबह आती है जब अचानक पक्षी पहली बार खींचन की धरती पर नजर आते हैं और फिर एक ऐसी सुबह भी आती है जब कल तक दिखने वाले

खींचन एवं मेनार के बढ़ते कदमों के सोपानों एक झलक नीचे प्रस्तुत है:

क्र. सं.	वर्ष	खींचन	मेनार
1	2004	महत्वपूर्ण पक्षी स्थल घोषित	-
2	2016	-	महत्वपूर्ण पक्षी स्थल घोषित
3	2023	कुर्जा कंजर्वेशन रिजर्व घोषित	नोटीफाइट वैटलैण्ड घोषित*
4	2025	रामसर स्थल घोषित	रामसर स्थल घोषित

*Wetlands (Conservation and Management) Rules, 2017 के अन्तर्गत राजस्थान सरकार द्वारा घोषित।

मेनार उदयपुर से 50 किमी दूर उदयपुर चित्तौड़गढ़ मार्ग पर स्थित एक छोटा सा गाँव है। मेनार एवं इसके आस-पास 20 किमी त्रिज्या क्षेत्र में मंगलवाड जलाशय, बडवई जलाशय, किशन करेरी जलाशय, खैरोदा जलाशय, रुन्डेडा जलाशय, नगावली जलाशय, भटेवर जलाशय, कर्णपुर जलाशय, वल्लभनगर (सर्जना तालाब) भिंडर तालाब, बडूपा माता तालाब, डबोक जलाशय, खेमली जलाशय आदि जलाशयों की एक महत्वपूर्ण शृंखला है जो पक्षियों के आवास एवं उनकी विविधता के कारण राजस्थान के श्रेष्ठ

पक्षियों में एक भी नजर नहीं आता। कभी कभी घायल या बिमार कुछ अभागे पक्षी नहीं उड़ पाने के कारण अपने साथियों से पीछे छूट जाते हैं तथा अपने जन्म स्थान वापिस नहीं पहुँच पाते।

खींचन गत बड़े समय से लोगों को ज्ञात था लेकिन मेनार पिछले 10-15 साल में विश्व पटल पर छाने में सफल हुआ है। हाँलाकि मेनार में स्थानीय बांशिंदे सदियों से पक्षीयों व उनके आवास को स्वयं के स्तर पर निष्ठा से संरक्षित करते आ रहे थे लेकिन वैश्विक पहचान 2014 के उदयपुर पक्षी मेले से बनना प्रारंभ हो गई। देखते ही देखते 2025 के आते - आते मेनार एवं खींचन "रामसर स्थल" घोषित हो गये। अब सांभर एवं केवलादेव राष्ट्रीय उद्यान के बाद दो नये रामसर स्थल बन जाने से राज्य में 4 रामसर स्थल हो गए हैं।

रहती है। अरब सागर की रेखिय दूरी भी दक्षिणी राजस्थान से अधिक नहीं है अतः समुद्र द्वारा दिन में सोखी गई सूर्य से प्राप्त गुप्त ऊष्मा रातों को अपेक्षकृत कम ठण्डा बनाने में मदद करती है जिससे कीट-पतंगे सर्दी में भी जीवित व सक्रिय

बने रहते हैं। यह स्थिति कीटाहारी पक्षियों के लिए मुफीद रहती है। अतः दक्षिणी राजस्थान में शीतकाल में अनेक हिस्सों में कीटाहारी पक्षियों को अच्छी संख्या में देखा जा सकता है



चित्र 1: मेनार गाँव के ब्रह्म तालाब की पाल पर लगा महत्वपूर्ण पक्षी स्थल शिला बोर्ड

वर्ष 2025 में उदयपुर शहर को रामसर कान्वेंशन द्वारा "वैटलैण्ड सिटी" का दर्जा भी मिल गया। मेनार, खींचन एवं उदयपुर वैटलैण्ड सिटी अब पर्यटकों के नये आकर्षक स्थल होंगे। उदयपुर शहर तो पर्यटन हेतु पहले ही विख्यात है लेकिन "वैटलैण्ड सिटी" की अपनी नई पदवी तथा मेनार की समीपता इस क्षेत्र के पर्यटन को नई ऊँचाई देगा।

उदयपुर संभाग में पिछले 20-30 वर्षों में प्राकृतिक आकर्षण के अनेक केन्द्र स्थापित हुये हैं जो धीरे-धीरे स्थानीय पर्यटकों, उदयपुर से बाहर राज्य के दूसरे हिस्से से आये पर्यटकों, देश के दूसरे राज्यों के पर्यटकों एवं विदेशी पर्यटकों हेतु आकर्षण का केन्द्र बनते जा रहे हैं।

कुछ आकर्षक के केन्द्र निम्न हैं :

क्र.सं.	केन्द्र	जिला	स्थिती/महत्ता*
1	कुम्भलगढ़ अभ्यारण्य	उदयपुर, राजसमंद एवं पाली	WLS, IBA, MPCA
2	टॉडगढ़ - रावली अभ्यारण्य	अजमेर, राजसमंद एवं पाली	WLS
3	सीतामाता अभ्यारण्य	प्रतापगढ़, चित्तौडगढ़ एवं उदयपुर	WLS, IBA, MPCA
4	फुलवारी की नाल अभ्यारण्य	उदयपुर	WLS, IBA
5	जयसमंद अभ्यारण्य	उदयपुर	WLS, IBA
6	सज्जनगढ़ अभ्यारण्य	उदयपुर	WLS, IBA
7	भैसरोडगढ़ अभ्यारण्य	चित्तौडगढ़	WLS
8	बस्सी अभ्यारण्य	चित्तौडगढ़	WLS
9	जवाई बान्ध लैपर्ड कंजर्वेशन रिजर्व	पाली	IBA, Part of Ramsar Site
10	बाघदड़ा क्रोकोडाइल कंजर्वेशन रिजर्व	उदयपुर	CR, IBA
11	हमीरगढ़ कंजर्वेशन रिजर्व	भीलवाड़ा	CR
12	महासीर कंजर्वेशन रिजर्व	उदयपुर	CR
13	अमरख महादेव लैपर्ड कंजर्वेशन रिजर्व	उदयपुर	CR
14	सज्जनगढ़ जैविक उद्यान	उदयपुर	Biological Park
15	पक्षी उद्यान (गुलाब बाग)	उदयपुर	Bird Park
16	जंगल सफारी पार्क	उदयपुर	Forest Park
17	सरेरी बाँध	भीलवाड़ा	IBA
18	सेर्ई बाँध	उदयपुर	IBA
19	उदयपुर झील संकुल	उदयपुर	IBA, Part of Wetland City
20	मेनार झील संकुल	उदयपुर	IBA, Notified Wetland, Ramsar Site
21	अरावली हर्बल गार्डन रेंज झाडोल	उदयपर	MPG
22	मकोड़िया हर्बल गार्डन रेंज ओगणा	उदयपुर	MPG
23	हर्बल गार्डन सरवन डेरी	बाँसवाड़ा	MPG
24	मेडिसनल प्लान्ट डवलपमेन्ट एरिया, कलेर वन खण्ड	उदयपुर	MPDA

25	मेडिसनल प्लान्ट डवलपमेन्ट एरिया, केवडा की नाल	उदयपुर	MPDA
26	जैव विविधता पार्क, अंबेरी	उदयपुर	Biodiversity Park
27	बटरफ्लाई पार्क, अंबेरी	उदयपुर	Butterfly Park
28	आर्किडेरियम, पानरवा	उदयपुर	Orchid Park
29	गोल्डन पार्क	उदयपुर	Forest Park
30	ईकोटोन पार्क	उदयपुर	Forest Park
31	फूलों की घाटी, चीरवा घाटा	उदयपुर	Forest Park
32	लव कुश वाटिका	उदयपुर	Forest Park
33	वनस्पति उद्यान केवडा की नाल	उदयपुर	Botanical Garden
34	शिव वन उद्यान, उबेश्वर	उदयपुर	Forest Park
35	नगर वन उद्यान	उदयपुर	Forest Park
36	बांकी वन अनुसंधान फार्म, सीसारमा	उदयपुर	Research Park

*WLS = Wildlife Sanctuary, IBA = Important Bird Area, MPCA = Medicinal Plant Conservation Area, MPDA MPCA = Medicinal Plant Development Area, MPG = Medicinal Plant Garden, CR = Conservation Reserve



चित्र 2: बाघदडा क्रोकोडाइल कंजर्वेशन रिजर्व, उदयपुर में विकसित पर्यटक सुविधा



चित्र 3: आर्किडेरियम, पानरवा में राज्य के अनेक ऑर्किडों को देखा जा सकता है। आर्किडेरियम से सटे हुए फुलवारी अभ्यारण्य के वनों में तरह-तरह के ऑर्किडों की आभा भी देखने योग्य है।

उपरोक्त संरक्षित क्षेत्रों एवं विकास ने उदयपुर संभाग में पर्यटन को नई दिशा व तीव्र गति प्रदान की है। वन विभाग द्वारा विकसित व प्रबंधित वन उद्यानों, अभ्यारण्यों, जैविक उद्यानों आदि को बड़ी संख्या में विद्यालय एवं महाविद्यालय के छात्राओं द्वारा देखा जाता है। अच्छी संख्या में आयुर्वेद महाविद्यालयों, मत्स्य पालन विज्ञान महाविद्यालयों एवं वन महाविद्यालयों के अध्ययनरत छात्र भी अपने अध्ययन उद्देश्य की पूर्ती हेतु यहाँ पहुँचते हैं। अतः यह क्षेत्र सामान्य पर्यटन एवं पारिस्थितिकी पर्यटन के साथ- साथ अध्ययन पर्यटन का केन्द्र भी बनता जा रहा है। भारत के वनों के वर्गीकरण पितामह सर हेनरी जी. चैम्पियन वर्ष 1961 में सप्ततीक बाँसवाडा, हूगरपुर, उदयपुर आदि क्षेत्रों की वन यात्रा कर आये थे। उन्होंने बाँसवाडा के घाटोल रेंज के एक

वन क्षेत्र में भी अपना दौरा किया था जिसे "चैम्पियन पॉर्ट" के रूप में याद किया जाता है। कर्नल टॉड जैसे इतिहासकारों का आगमन व निवास टॉडगढ़-रावली अभ्यारण्य से जुड़ा हुआ है। पूरे राजस्थान में ऐसे अनेक स्थल हैं जहाँ देश-विदेश की विभूतियों का आगमन हुआ है। उन सब क्षेत्रों को भी पारिस्थितिकी पर्यटन का हिस्सा बनाकर पर्यटन को नई दिशा दी जा सकती है।

सतीश कुमार शर्मा

राजस्थान वन सेवा (सेवा निवृत)

14-15, चक्रिया आम्बा, रामपुरा चौराहा, ज्ञाडोल रोड
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Acoustic Tourism in India: Exploring the Science of Sound through Heritage

Dr Neha Sharma



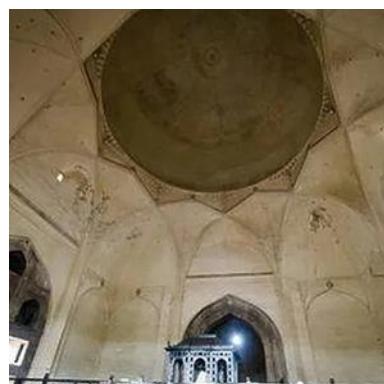
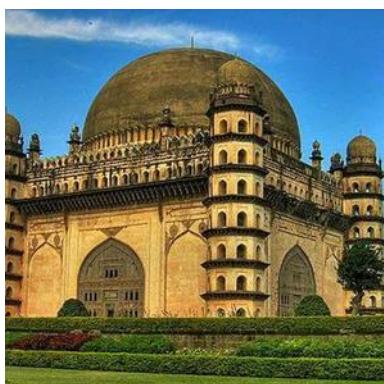
Sound has always held a profound place in Indian tradition, not just as a medium of communication or music but as an expression of spirituality and cultural identity. The resonant ringing of temple bells, the deep reverberation of conch shells, and the rhythmic chanting of mantras are more than rituals, they are experiences deeply rooted in the science of acoustics. The ringing bell is said to clear the mind and create focused vibrations, while the conch produces low-frequency sound waves believed to purify the environment and uplift the spirit. These practices show how ancient Indians harnessed the power of sound for both spiritual and physical well-being.

In modern times, this interplay of tradition and science extends into the realm of acoustic tourism, where travellers can explore architectural marvels that

ingeniously employ the principles of sound. India, with its rich architectural and cultural legacy, offers a fascinating journey into whispering galleries, musical pillars, and resonant chambers spaces where physics and heritage converge.

Whispering Galleries: Secrets in the Walls

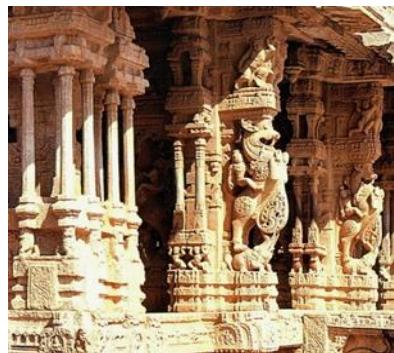
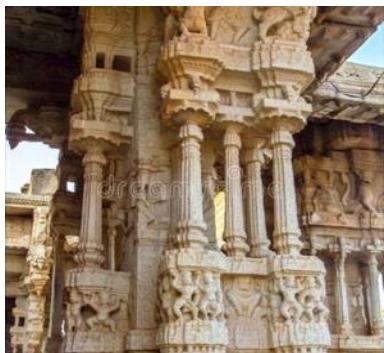
One of the most intriguing acoustic phenomena lies in the design of whispering galleries. These are curved or domed chambers that carry even the faintest whisper across long distances. A classic example is the Gol Gumbaz in Bijapur, Karnataka. The mausoleum of Mohammed Adil Shah features one of the world's largest domes without supporting pillars. Visitors who whisper against the wall in the circular gallery can be heard distinctly on the opposite side, even over a range of about 30 meters away.



The science behind this lies in the curvature of the dome, which reflects sound waves along its surface without significant loss of energy. The elliptical geometry channels the sound efficiently, much like the way modern auditoriums are designed for perfect acoustics. For travellers, standing in the Gol Gumbaz's whispering gallery is a remarkable experience of how ancient architects intuitively understood and applied principles of wave reflection and resonance.

Musical Pillars: Stone that Sings

Another fascinating marvel of India's acoustic heritage is the musical pillars found in temples. The most celebrated examples are in the Vittala Temple at Hampi, Karnataka, and the Meenakshi Temple at Madurai, Tamil Nadu. These stone pillars, when gently struck, produce musical notes akin to the sounds of different instruments.



The science behind them lies in the material, density, and dimensions of the stone pillars. Each pillar is meticulously carved to resonate at specific frequencies, creating distinct notes. The phenomenon is like how tuning forks or xylophone bars work, where vibration of a solid body produces sound waves of particular frequencies. For the ancients, these were not mere decorative elements but demonstrations of the harmony between art, science, and spirituality. Today, though striking is restricted to prevent damage, the very presence of such structures continues to inspire awe.

Golconda Fort, Hyderabad: The Strategic Power of Sound

While many acoustic marvels in India are spiritual or artistic, the Golconda Fort in Hyderabad showcases the strategic application of sound. At the entrance, a clap made under the grand dome of the Fateh Darwaza can be distinctly heard nearly a kilometre away at the Bala Hissar pavilion, the highest point of the fort. This ingenious system served as an early warning signal alerting soldiers of visitors or invaders without relying on visual communication.



Scientifically, this effect is achieved through sound wave reflection and channelling along the vaulted passages and walls. The architectural design ensures minimal dissipation of sound energy, allowing the clap to travel clearly across long distances. Golconda thus represents a unique case where acoustics were harnessed for security and military intelligence, blending science seamlessly into defence architecture.

Sound in Temple Architecture

Temple architecture in India frequently employed acoustics to amplify devotional experience. High domes and open courtyards ensured that chants and bhajans carried naturally without artificial amplification. Even the strategic placement of water tanks and stone corridors helped modulate sound and create resonant effects, making group prayers and rituals immersive experiences.

Not-to-Miss Acoustic Heritage Sites in India

For science tourists and enthusiasts, here are some must-visit sites that highlight India's acoustic brilliance:

- Gol Gumbaz, Karnataka – Whispering gallery where faintest sounds travel across the dome.
- Vittala Temple, Hampi – Musical stone pillars producing harmonic notes.

- Meenakshi Temple, Madurai – Intricately carved pillars resonating with musical tones.
- Golconda Fort, Hyderabad – Clap echoes used for strategic communication.
- Ajanta & Ellora Caves, Maharashtra – Natural caves with extraordinary echo effects.
- Konark Sun Temple, Odisha – Architectural elements designed to resonate with sound and chants.

Sound, in India, is not merely heard—it is experienced. From the sacred vibration of a conch shell to the architectural brilliance of whispering galleries, musical pillars, and resonant forts, India's acoustic heritage reflects a deep understanding of both science and spirituality. For the science tourist, these sites are more than destinations; they are immersive journeys into the resonance of tradition and the echoes of physics.

By exploring acoustic tourism, one not only appreciates the genius of ancient Indian architecture but also rediscovers how sound continues to connect culture, science, and society in profound ways.

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Konark Sun Temple: An Ancient Science Tourist Site

Dr. Smruti Smita Mohapatra

The Konark Sun Temple, built in the 13th century CE, is a Hindu temple dedicated to the Sun, located approximately 35 kilometres (22 miles) northeast of Puri city along the coast in the Puri district of Odisha, India. King Narasingha Deva I of the Eastern Ganga dynasty is credited with its construction around 1250 CE.

This temple is considered the zenith of Hindu Orissan architecture. It is devoted to the Sun-God Surya and showcases the height of Kalingan architectural and artistic achievement. What remains of the temple complex resembles a chariot towering 100 feet (30 meters), complete with massive stone-carved wheels and horses. Once reaching over 200 feet (61 meters) in height, much of the temple is now in ruins, particularly the large shikara above the sanctuary, which formerly towered significantly over the remaining mandapa.

Also known as Surya Devalaya, it exemplifies the Odisha or Kalinga style of architecture. The Konark Sun Temple is featured on the reverse side of the Indian 10-rupee currency note, highlighting its significance in Indian cultural heritage. The name "Konark" is derived from the Sanskrit words *Kona* (meaning corner or angle) and *Arka* (meaning the sun). *Kona* likely refers to the temple's southeast position, either within a larger complex or in relation to other sun temples across the subcontinent. The term *Arka* points to the Hindu sun deity Surya.



Design

The temple exemplifies the traditional Kalinga architectural style. It faces east to allow the first rays of sunlight to illuminate the main entrance. Constructed from Khondalite stones, the temple was initially built at the confluence of the river Chandrabhaga, but the water level has since decreased. The temple's wheels serve as sundials, capable of measuring time accurately to the minute. The Konark Sun Temple, situated on India's eastern coast in Odisha, is regarded as one of the most remarkable architectural, scientific, and cultural achievements of ancient India. European sailors frequently referred to it as the "Black Pagoda" due to its dark hue and towering form. Beyond being merely a place of worship, the Konark Sun Temple stands as a testament to India's sophisticated understanding of astronomy, magnetism, and architecture. Many contend that if the temple had endured in its entirety, it would undoubtedly be considered one of the Wonders of the World for its intricate design and scientific importance.

History and Ancient Importance

Constructed around 1250 AD, the temple took about 12 years to complete and engaged nearly 1,200 craftsmen. Commissioned by King Narasimhadeva I, it was built to commemorate his dynasty's triumph and signify India's reverence for Surya. The architecture of the temple is remarkable designed to resemble a grand chariot with 12 pairs of exquisitely carved wheels, symbolizing the 12 months of the year. Each of these wheels embodies the flow of time, with the Sun's movement across the sky mirrored by seven stone-carved horses that pull the chariot. At the heart of this chariot stood a colossal idol of the Sun God, which was said to float, owing to the temple's incredible application of magnetic principles. The wheels of the Konark Sun Temple serve a dual function. Meticulously crafted, these 24 wheels act as sundials. Each wheel features eight spokes, representing 24 hours, and the shadow cast by these spokes allows for precise timekeeping when illuminated by sunlight. Before the advent of watches, this innovative method was the traditional means of telling time. Each spoke corresponds to a pahar, which is a three-hour time segment, highlighting the advanced knowledge of astronomy possessed by the temple's designers.



Magnetic Fields and Foreign Scientists' Theories

The magnetic field present in the temple is one of its most intriguing features. Historical records indicate that a large magnetic lodestone was situated at the temple's peak, which, along with various strategically positioned magnets, formed a strong magnetic field. This field was thought to enable the idol of the Sun God to float within the central sanctum, drawing significant interest from historians and researchers alike. In the early 19th century, scholars from abroad, including William Jones and James Ferguson, recorded the enigmatic magnetic phenomena at Konark. Their investigations proposed that the lodestone might have disrupted maritime navigation, leading to compass inaccuracies for sailors navigating near the Odisha coast. Some theories suggest that ancient Indian knowledge of magnetism and Vedic science, as referenced in texts like the Rigveda, may have shaped the construction methods used at Konark.

Architectural Marvel and Symbolism in Stone

The Konark Sun Temple stands as an extraordinary feat of engineering and a brilliant example of symbolic art. Each of its 24 wheels functions as both an ornamental element and a tool for astronomical calculations. These wheels can measure time with precision down to the minute, serving as effective sundials. Additionally, the temple's architecture embodies the celestial chariot of Surya, pulled by seven horses.

The seven horses represent:

The seven colours of sunlight (violet, indigo, blue, green, yellow, orange, and red) can be seen in a rainbow.

The seven days of the week highlight the cyclical nature of time.

The seven chakras (energy centres) within the human body symbolize the energy flow sustained by the Sun.

Ancient Indian Wisdom

The dismantling of the Konark Sun Temple robbed humanity of a richer knowledge of ancient Indian science. The temple served as a reservoir of Vedic wisdom, reflecting India's sophisticated grasp of astronomy, magnetism, and architecture. Its elaborate design and scientific advancements were remarkably progressive for its time. Vedic texts, like the Rigveda and Yajurveda, allude to the significance of the Sun and solar energy. The Konark Sun Temple, built upon this extensive cosmological insight, functioned not only as a site of worship but also as a hub for exploring the universe and its celestial dynamics.

Konark as a Global Marvel

The Konark Sun Temple, showcasing an amalgamation of science, spirituality, and artistry, merits acknowledgment as one of the World's Wonders. Its distinct application of magnetic technology and precision in astronomy illustrates the genius of ancient Indian innovations. The temple epitomizes India's creative essence and cultural richness, warranting worldwide celebration.

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अंतरिक्ष - यात्रा

गौरीशंकर वैश्य विनम्र

आओ! हम योजना बनाएँ।

अंतरिक्ष - यात्रा पर जाएँ।

मिट्टी, पानी, खनिज धातुएँ

कई शीशियों में भर लाएँ।

चंदा मामा के घर ठहरें

धमाचौकड़ी वहीं मचाएँ।

वहीं से देखेंगे धरती को

हरियाली पर बलि - बलि जाएँ।

नए - नए रहस्य जानेंगे

मस्ती से छुट्टियाँ बिताएँ।

मंगल ग्रह अगला पड़ाव है

अपनी बस्ती नई बसाएँ।

सौरऊर्जायान क्षितिज पर

बड़े मजे से खूब उड़ाएँ।

गगनयान इसरो भेजेगा

यात्रियों में नाम लिखाएँ।

शून्य गुरुत्वाकर्षण में हम

नए - नए करतब दिखलाएँ।

गौरीशंकर वैश्य विनम्र

११७ आदिलनगर, विकासनगर,

लखनऊ २२६०२२

दूरभाष ०९९५६०८७५८५.

Exploring the Stars: Science Tourism Through India's Astronomic and Space Centres

Mr. Chetan Gogia

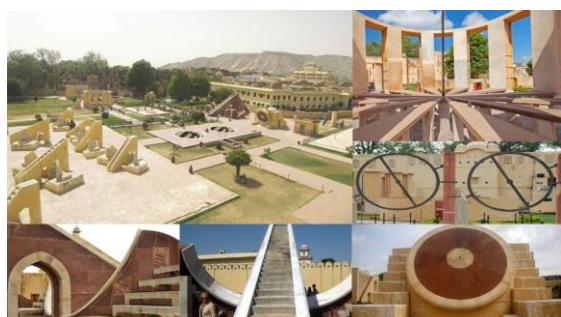
From ancient stone observatories to futuristic rocket launchpads, India offers a rare journey through humanity's fascination with the cosmos. Science tourism here is not just about travel it's about tracing the story of how India has looked at the skies for centuries, and how it continues to reach for the stars today.

Seen from above through a drone's eye these sites reveal their grandeur and their role in shaping our understanding of the universe.

Heritage Astronomical Observatories

1. Jantar Mantar - Jaipur and Delhi

Built by Maharaja Jai Singh II in the 18th century, these UNESCO World Heritage sites are marvels of scientific architecture. The enormous sundials and celestial instruments, when viewed from above, appear as geometric sculptures carved into the landscape. They once allowed astronomers to track time, predict eclipses, and chart the skies with astonishing accuracy.



2. Ujjain's Vedh Shala (Madhya Pradesh)

Dating back to the 17th century, Vedh Shala was a centre for astronomical study in India. Situated on the Tropic of Cancer, it still houses ancient instruments like sundials and quadrants. A drone view reveals its compact yet symbolic design—a glimpse into the intellectual legacy of Indian astronomy.



Modern Space Research & Exploration

3. ISRO Satellite Launch Centre (Sriharikota, Andhra Pradesh)

India's gateway to space. The Satish Dhawan Space Centre is where rockets like PSLV and GSLV roar into the sky. From above, the twin launch pads and sprawling facilities against the Bay of Bengal coastline make for one of the most dramatic science tourism visuals in the country.



4. U. R. Rao Satellite Centre (Bengaluru, Karnataka)

The brain of India's satellite program. Here, communication, navigation, and weather satellites are designed and tested. Though entry is restricted, Bengaluru's role as ISRO's headquarters makes it a hub for space enthusiasts.



5. Indian Institute of Astrophysics & Vainu Bappu Observatory (Kavalur, Tamil Nadu)

Nestled in the Javadi Hills, the Vainu Bappu Observatory houses one of Asia's largest telescopes. From a drone's perspective, its dome gleams white against lush forests, symbolising India's pursuit of deep-sky observation.



6. Gauribidanuru Radio Observatory (Gauribidanuru, Karnataka)

The Gauribidanuru Radio Observatory, a radio telescope observatory located at Gauribidanuru, near Bengaluru is operated

jointly by Raman Research Institute and the Indian Institute of Astrophysics since 1976.



7. Giant Metrewave Radio Telescope (Pune, Maharashtra)

One of the world's largest arrays for studying radio waves from distant galaxies. Spread across 30 antennas in Khodad village, the aerial view looks like a futuristic field of giant discs scanning the universe.



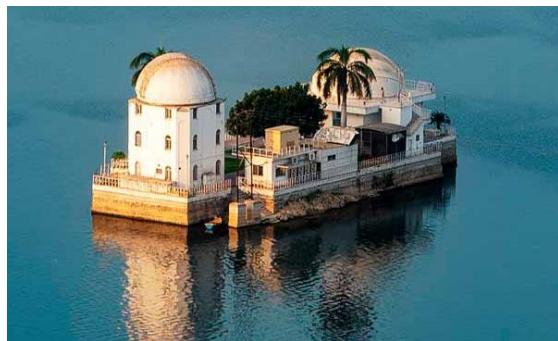
8. Kodaikanal Solar Observatory (Kodaikanal, Tamil Nadu)

This solar observatory, situated on the southern tip of the Palani Hills 4 kilometres from Kodaikanal, is owned and operated by the Indian Institute of Astrophysics. Established in 1899, The Kodaikanal Solar Observatory focuses on solar physics and helioseismology. The Evershed effect was first detected at this observatory in 1909.



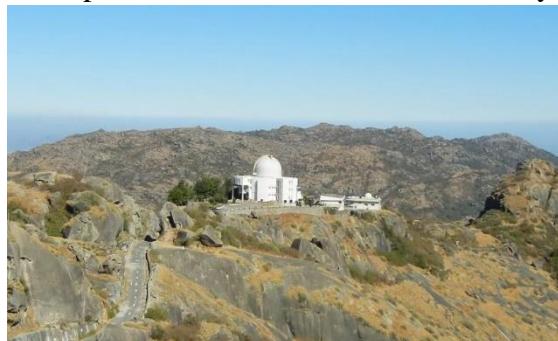
9. Udaipur Solar Observatory (Rajasthan)

Udaipur Solar Observatory, situated on an island in the Fateh Sagar Lake, provides a favourable atmosphere for solar observations, with minimum air turbulence sharp images of the sun can be acquired. The observatory comprises a range of telescopes that provide excellent quality of solar observations.



10. Mount Abu InfraRed Observatory (Rajasthan)

Mount Abu Observatory, also known as the Infrared Observatory, situated on Guru Shikhar, the highest peak of the Aravalli Range in Mount Abu, Rajasthan, was established in 1962. Managed by the Physical Research Laboratory, this observatory plays a vital role in various research areas including astrophysics, atmospheric sciences, and astronomy.



11. Indian Astronomical Observatory (Hanle, Ladakh)

At 4,500 metres above sea level, Hanle is one of the world's highest observatories. The dry, clear skies of Ladakh make it ideal for studying the night sky. A drone eye captures domes dotting the barren landscape—science thriving in one of Earth's toughest environments.



Why Visit These Centres?

- For history lovers – India's stone observatories show how ancient science blended architecture, mathematics, and art.
- For space enthusiasts – ISRO's launch pads and research hubs reflect India's global role in space exploration.
- For travellers – these centres are set in breathtaking landscapes: deserts, hills, forests, and coastlines, making the journey as rewarding as the science.

From past to present, India's astronomic and space centres invite travellers to look up, to wonder, and to see how science is woven into the country's cultural and natural fabric.

Mr Chetan Gogia is a CAA approved Drone Pilot in the UK. He can be reached at airmarketer2021@gmail.com

एक्सोम मिशन पर

आधारित विज्ञान प्रश्नोत्तरी

गौरीशंकर वैश्य विनम्र

1. अंतरराष्ट्रीय अंतरिक्ष स्टेशन पर जाने वाला प्रथम भारतीय कौन है?

- (क) सुनीता विलियम्स
- (ख) कल्पना चावला
- (ग) शुभांशु शुक्ला
- (घ) राकेश शर्मा

2. अंतरिक्ष की सैर करने वाले पहले भारतीय कौन हैं?

- (क) प्रशांत नायर
- (ख) राकेश शर्मा
- (ग) शुभांशु शुक्ला
- (घ) अनिल मेनन

3. अंतरराष्ट्रीय अंतरिक्ष स्टेशन पर पहुँचने वाले मिशन का नाम क्या है?

- (क) गगनयान
- (ख) स्टार लैब
- (ग) स्पेस मिशन
- (घ) एक्सोम - 4

4. अंतरराष्ट्रीय अंतरिक्ष स्टेशन (पृथ्वी की कक्षा) में सदस्यीय दल ने अधिकतम कितने दिन बिताने का कीर्तिमान स्थापित किया?

- (क) 22 दिन
- (ख) 15 दिन
- (ग) 18 दिन
- (घ) 12 दिन

5. अंतरिक्ष यात्रियों का 'ड्रैगन ग्रेस' अंतरिक्ष यान किस महासागर के तट पर उतरा?

- (क) प्रशांत महासागर
- (ख) हिन्द महासागर
- (ग) अरब महासागर
- (घ) इनमें से कोई नहीं

6. अंतरिक्ष यात्री शुभांशु शुक्ला भारत के किस नगर के मूल निवासी हैं?

- (क) बैंगलुरु
- (ख) नई दिल्ली
- (ग) लखनऊ
- (घ) चेन्नई

7. एक्सओम - 4 मिशन का निम्नलिखित में से कौन - सा एक उद्देश्य नहीं है?

- (क) अंतरिक्ष विज्ञान शिक्षण
- (ख) माइक्रोग्रैविटी में प्रयोग
- (ग) टेक्नोलॉजी टेस्टिंग
- (घ) वैश्विक स्तर पर भारत को एक मंच पर लाना

8. एक्सोम मिशन के अंतरिक्ष यात्रियों ने पृथ्वी की कितनी परिक्रमाएं कीं?

- (क) 433
- (ख) 288
- (ग) 566
- (घ) 377

9. एक्सोम स्पेस कंपनी किस देश से संबंधित है?

- (क) भारत
- (ख) चीन
- (ग) अमेरिका
- (घ) रूस

10. अंतरराष्ट्रीय अंतरिक्ष स्टेशन से ड्रैगन यान अंतरिक्ष से अलग होकर धरती तक की यात्रा कितने घंटे में पूरी की?

- (क) 18 घंटे
- (ख) 22 घंटे
- (ग) 28 घंटे
- (घ) 25 घंटे

11. स्पेस एक्स के फाल्कन-9 राकेट ने किस सेंटर से अंतरिक्ष के लिए उड़ान भरी थी?

- (क) कैनेडी स्पेस सेंटर
- (ख) इसरो सेंटर
- (ग) ब्लू ओरिजन सेंटर
- (घ) पोस्ट स्पेस सेंटर

12. एक्सोम स्पेस मिशन के अंतर्गत अंतरिक्ष यात्री अंतरराष्ट्रीय अंतरिक्ष स्टेशन के लिए कब रवाना हुए थे?

- (क) 22 जून
- (ख) 10 जून
- (ग) 15 जून
- (घ) 25 जून

13. शुभांशु शुक्ला के लिए 'एक्सोम - 4 मिशन बैज 'किस प्रसिद्ध भारतीय डिजाइनर ने बनाया?

- (क) आशुतोष गोवारिकर
- (ख) डॉ. हरपाल सिंह
- (ग) मनीष त्रिपाठी
- (घ) विजय मल्होत्रा

14. मिशन एक्सोम में कुल कितने अंतरिक्ष यात्री अंतरराष्ट्रीय अंतरिक्ष स्टेशन के लिए गए थे?

- (क) 7
- (ख) 5
- (ग) 6
- (घ) 4

15. अंतरिक्ष में गुरुत्वाकर्षण कितना होता है?

- (क) शून्य
- (ख) पृथ्वी से दोगुणा
- (ग) पृथ्वी के बराबर
- (घ) पृथ्वी का आधा

उत्तर - 1. (ग), 2. (ख), 3. (घ), 4. (ग),
 5. (क), 6. (ग), 7. (क), 8. (ख),
 9. (ग), 10. (ख), 11. (क), 12. (घ),
 13. (ग), 14. (घ), 15. (क)

गौरीशंकर वैश्य विनम्र
 ११७ आदिलनगर, विकासनगर,
 लखनऊ २२६०२२
 फ़ोरम्यास ०९९५६०८७५८५.



Event reports

Vigyan Parv 2025

The Vigyan Setu Foundation successfully organized Vigyan Parv 2025, a national-level initiative aimed at fostering scientific inquiry and innovation among participants from across the country. The theme for the Vigyan Parv 2025 was Science for the Sustainable Society.

This year's event witnessed enthusiastic participation, with 109 participants, in the Junior Group, registered nationwide. Every participant was allowed to make a virtual presentation for six minutes. Each submission was rigorously evaluated by a panel of three expert evaluators.

The assessment was carried out on six carefully defined parameters: 1. Identification of societal problem 2. Hypothesis formulation 3. Design of study, including experimentation 4. Presentation of results in tabular or graphical formats 5. Conclusions drawn 6. Approach towards building a sustainable society.

The evaluators provided percentage scores, which were averaged and subsequently converted into four grades (A, B, C, D) to ensure fair and transparent assessment.

- Grade A: Winners
- Grade B: Runner-Ups
- Grade C&D: Participation acknowledged.

Based on this grading system, the event concluded with the declaration of two Winners (Grade A) and two Runners-Up (Grade B) at the national level. The Vigyan Parv 2025 not only celebrated scientific talent but also highlighted the importance of research-led solutions for societal and environmental sustainability. The Foundation takes pride in providing a platform that nurtures creativity, critical thinking, and problem-solving skills among the youth of the nation.

The Winners were:

Miss Suhani Kiran Mehta (Bunts Sangha's S M Shetty High School and Junior College, Powai, Mumbai)

Master Abhay Pratap Singh (St. Paul's School, Jaisalmer, Rajasthan)

The Runner-ups were:

Miss Vanshika Jitendra Mehta (St. Paul's School, Jaisalmer, Rajasthan)

Master Ved Sharad Karale (Bunts Sangha's S M Shetty High School and Junior College, Powai, Mumbai)

Sheetal Bhatt (Presenting)

3:18 01:26

Ways to Reduce Plastic Problems

- Use cloth or jute bags instead of plastic bags
- Recycle and reuse plastic items
- Avoid single-use plastics
- Spread awareness about plastic pollution
- Support eco-friendly alternatives

Sheetal Bhatt

Vigyan Setu ... Chetan Gogia Dr Neha



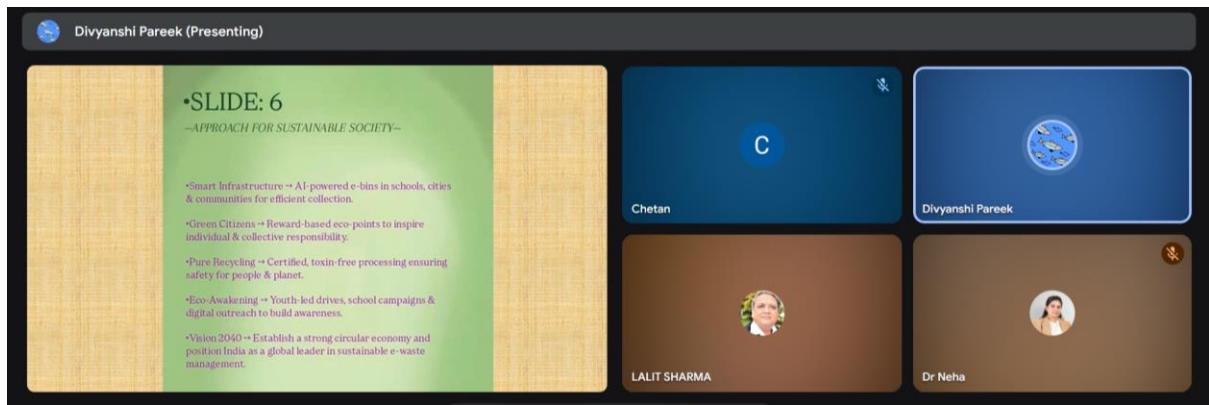
A Abhay Pratap Singh (Presenting)

Abhay Pratap Singh | Class 7th B | St. Paul's School, Jaisalmer | Vigyan Parv 2025

Can Grey Water from Homes Be Safely Reused for Gardening?

Vigyan Setu ... Chetan Dr Neha





Snippets from the virtual presentations made by enthusiastic students from across the country



The Winner and the Runner-up of Vigyan Parv 2025 from Bunts Snagha's S M Shetty High School and Junior College, Powai, Mumbai being honoured with the Certificate and Prize by Dr Lalit Sharma, Managing Trustee, Vigyan Setu Foundation, in the august presence of the Headmistress, Ms Reshma Rao

Rabies Awareness

Rabies, a neglected tropical disease, disproportionately affects marginalized populations, making awareness and prevention efforts among these communities a top priority. One of the core objectives of the Vigyan Setu Foundation is to raise awareness and sensitize society about critical animal and public health issues.

After the success of three previous initiatives Zoonoses Ambassador 2022, Zoonoses Ambassador 2024, and Rabies Ambassador 2023 the Vigyan Setu Foundation proudly launched the Rabies Ambassador 2025 (RA25) programme on World Animal Day, October 4, 2024.

The RA25 programme aimed at extending its reach as broadly as possible, focusing on raising awareness and promoting rabies prevention through the efforts of prospective Rabies Ambassadors. These Ambassadors were expected to conduct presentations, deliver talks, and hold interactive sessions in schools, colleges, public meetings, and social gatherings. The goal was for the direct beneficiaries to carry the message to their families, friends, and acquaintances, expanding the RA25

programme's impact through indirect education.

Likewise, the following Rabies Ambassadors were honoured with the e-Certificate of Commitment;

- Ms Pushpinder Kaur
- Dr Anurag Singh Kushwaha
- Dr Krishnendu Kumar De
- Dr Deepak Sharma
- Dr Vikas Mishra
- Dr Rajesh Senma
- Dr Lankesh Bhaisare
- Dr Smruti Smita Mohapatra

On the occasion of the World Rabies Day, an online Quiz was launched which would remain active from 28/09/2025 until 30/09/2025 midnight.

Meanwhile, an interactive session on Rabies Awareness was conducted by our Managing Trustee, Dr Lalit Sharma, for the sixth graders of Bunts Sangha's S M Shetty High School and Junior College, Powai, Mumbai on 25 September 2025. Around 250 of the agile, active, and alert audience not only imbibed what was communicated but shared their personal experiences.

Here are some snippets from the event conducted;

