

GENOME TO OM ONLINE CONTENTS

Advance Praise

Foreword by Dr Guraraj Mutalik

Plates

Glossary of Vedic Terms

Bibliography

Acknowledgements

Advance Praise

“A thought-provoking exploration of the frontiers where science meets spirituality. *Genome to Om* challenges our assumptions and pushes the boundaries of knowledge. A must-read for anyone curious about the future of scientific inquiry. The nine chapters link the reality of the world we live in and the challenges we face, as represented by Genome, which can only be resolved by realizing the true identity, with Om. The authors introduce an interesting concept of the Omcene, the future epoch, with the utopian but feasible goal of a global meta-society focused on universal well-being, finding unity in diversity. A timely endeavour in a world torn apart by wars, disease, and distrust.”

Dr K. Kasturirangan, Padma Vibhushan

Former Chairman, Indian Space Research Organisation;
former Director & Emeritus Professor,
National Institute of Advanced Studies, Bengaluru, India; Chairman,
National Education Policy Committee, 2020

“This landmark book bridges 21st-century science with insights from Vedic tradition. A central conundrum concerning the thesis of this book is whether the brain gives rise to consciousness or whether consciousness gives rise to the brain and all matter. The remarkable journey from the genome back to the quantum expression of consciousness, the universal sound or hum, *Om*, is expertly led by the two authors who are deeply immersed in both the science and heritage of their subject. This remarkable book offers a roadmap for the future understanding and exploration of both quantum reality and of consciousness and, indeed, its computability by quantum standards. It is a book for our time.”

Dr Gerard Bodeker, MD, PhD

Eminent public health expert, Green Templeton College,
University of Oxford; Adjunct Professor of Epidemiology,
Columbia University; Chair Advisory Group, Western Sydney
University, Australia; Editor-in-Chief, The WHO Global Atlas of
Traditional, Complementary and Alternative Medicine

“*Genome to Om* is a veritable tour de force, an encyclopaedic and thought-provoking view of the interface of science and spirituality. It presents a compelling blueprint for humanity to achieve a bright and vibrant future.”

Dr Vikas P. Sukhatme, MD, ScD

Dean and Robert W. Woodruff Professor of Medicine,
Emory School of Medicine; Founding Director,
Morningside Centre for Innovative and Affordable Medicine;
Chief Academic Officer, Emory Healthcare;
former Faculty Dean for Academic Programs,
Beth Israel Deaconess Medical Centre,
Harvard Medical School, Boston, USA

“A brilliant treatise of science, philosophy, psychology, and spirituality. It explores the evolution of S&T towards a meta-scientific awareness of one’s Self. The authors take us on an intellectual journey into philosophical and spiritual aspects of existence, consciousness, and the nature of reality. They interweave inspiration from the Upanishads and the *Bhagavad Gita*. The journey in reading this work leads us to appreciate the potential of meta-science as a holistic approach to scientific inquiry, blending ethical, moral, intuitive, and spiritual insights. The book is a poetic and prophetic guide to lead us out of the chaos of today’s world toward a future of unity, tolerance, and understanding.”

Dr Julia T. Arnold, PhD, MS

Senior cancer researcher; former Program Director and
Special Volunteer, NCI Office of Cancer Complementary and
Alternative Medicine, National Institutes of Health,
Maryland, USA

“My dear friend Bhushan Patwardhan has been doing great work for many years. *Genome to Om* is another feather in his cap. This book, co-authored by him and Indu Ramchandani, is a call to embrace an innovative, inclusive, technologically advanced, yet spiritually enriched and ethically grounded future. It is closely aligned with my views and work. I wish this endeavour great success.”

B.M. Hegde, MD, FAMS, MRCP (UK), FRCP

(London, Edinburgh, Glasgow & Dublin), FACC (USA),
PhD (Hon. Causa), Padma Vibhushan
Former Vice Chancellor and Professor of Cardiology, Manipal Academy
of Higher Education, Manipal, India

“Modern science based on Cartesian thinking has produced an enormous amount of knowledge and incredible technological progress. Its focus is on the direct cause-effect principle, mechanistic details and experiments while the consciousness of humans as observers is often disregarded. There is an urgent need to develop new models of thinking based on ethical, moral and spiritual insights and respect the interconnectedness of all aspects of life. This multi-perspective thinking forms the basis for what the authors call meta-science. The wide variety of topics covered shows that this thinking can be applied to all areas of life and can lead to amazing insights. It is a courageous attempt resulting in an impressive outcome.”

Dr med. Georg Seifert, MD, PhD

Specialized physician for Integrative Medicine and Professor of Paediatric Oncology and Haematology, Berlin Center for Rare Diseases, Charité University, Berlin, Germany

“An insightful book exploring the intersection of science and spirituality, particularly how yoga, including meditation, can influence our genes and well-being. The book links the Ayurvedic concept of Prakriti with modern science, advocating for the evolution of science into a meta-science termed *Prajnana*. The book draws on the latest scientific research to highlight the significant impact of yoga on physical and mental health. Its engaging writing makes complex topics accessible to both those with a scientific background and those seeking deeper life understanding. The book emphasizes the importance of Yoga as a science of holistic living in daily life and presents practical techniques for integrating these practices. I highly recommend *Genome to Om* to anyone interested in the science of well-being and the power of mindful practices in cultivating peace and wholeness.”

Dr H.R. Nagendra, PhD, DSc, Padma Shri, Yoga Shri
Chancellor, Swami Vivekananda Yoga Anusandhana Samsthana University (S-VYASA University), Bengaluru, India;
Acclaimed Yoga guru and pioneer of cyclic meditation

“This compelling book delves into a broad spectrum of modern and contemporary scientific concepts, seamlessly intertwining them with meta-science, spirituality, and the notions of the microcosm and macrocosm. The exploration knows no bounds, like the diverse *darshanas* found in Indian philosophies. The discussion on genetics resonates deeply

with ancient Ayurvedic texts. The book portrays a historical narrative of how in the past, science, philosophy, culture, and spirituality were intricately interwoven, mutually enriching each other and evolving. It was great learning to read such a thought-provoking work and believe it would greatly benefit students of Ayurveda. The title, *Genome to Om*, encapsulates the essence of the book intriguingly!"

Vaidya Rajesh Kotecha, MD (Ayu), Padma Shri
Secretary to the Government of India, Ministry of AYUSH;
former Vice Chancellor, Gujarat Ayurveda University,
Jamnagar, India

"Ayurgenomics, which explores and synthesizes Ayurveda with genomics, is a budding discipline in social sciences. Through *Genome to Om*, the authors seek to blend technological marvels with the ancient Indian knowledge system and offer a roadmap for physical and spiritual peace and harmony for the diverse and often conflictual global community. My warm greetings and best wishes to Shri Patwardhan and Indu Ramchandani for this timely endeavour."

Dr Santishree Pandit, MSc, PhD
Vice Chancellor, Jawaharlal Nehru University, New Delhi;
Professor of Political Science,
Savitribai Phule Pune University, India

"*Genome to Om* delves deep into the basis of living, the meaning of life, and its origins. We haven't yet figured out how the whole process from the cell or the cosmos works. 'Om' is the primordial sound of the Cosmos, which pervades the universe. 'Om' allows us to explore the inner reality, which is important for the realization of self. The microcosm and macrocosm are explained very well in the book as one continuum. There is a quote in the *Bhagavad Gita* which says *Anoraneeyan Mahato Maheeyan* which means 'God exists everywhere and manifests as both the infinitesimal and the Infinite.' This book makes a wonderful reading and leads us to realize the purpose of life from science to meta-science."

Dr Carani B. Sanjeevi, MD, MSc, PhD
Professor of Molecular Medicine, Department of Medicine,
Karolinska Institute, Karolinska University Hospital,
Stockholm, Sweden; former Vice-Chancellor,
Sri Sathya Sai Institute of Higher Learning (Deemed University),
Andhra Pradesh, India

“The book, *Genome to Om*, is a journey of the mind of the authors who seek answers to the greater meaning of life. Om is in fact at the core of the genOMe! As scientists we are looking out for evidence-based answers to the questions of health and life, however we reach a dead end when it comes to the role of science in giving us answers to the bigger picture of life. This book raises a number of questions for which some answers are provided on the spiritual and philosophical level while remaining in contact with the reality of science. This book is a must-read for anyone looking for the deeper meaning of life and its connect with the reality of science.”

Lt Gen. Dr Madhuri Kanitkar, MD (Paediatrics),
PVSM AVSM VSM (Retd.)

Vice Chancellor, Maharashtra University of Health Sciences, India;
former Dean and Professor of Paediatrics,
Armed Forces Medical College, Pune, India

“If there is a single word that has the deepest meaning in Hindu Philosophy, it is ‘Om’. Recordings of the sounds of space, that reverberate through the universe, closely resemble the sound of ‘Aum’. *Genome to Om* covers spectacular advances in science and technology as also its perils. In the 21st century, the world will run more on intelligence than industry, and in the next century, the transformation will be complete. It isn’t that everyone will be working with AI and ML, but major changes in the world will depend upon the intelligence of machines and not human. To what extent the world will change, is difficult to forecast. Yet one thing shall remain constant, our study of the Genome and our philosophy of Om.”

Dr Ravindra Ghooi, MSc (Pharmacology), PhD (Medicine)

Director, Scientia Clinical Services; former Professor of Pharmacology,
Symbiosis International University; Chairman, Ethics Committee,
Sahyadri Clinical Research and
Development Centre, Pune, India

“This book links historical science and knowledge to the present time. *Genome to Om* certainly sheds light on the marvels of science, the perils, and the way forward, and forces all of us to think of a new paradigm that can herald a better future for the benefit of mankind.”

Dr Ikhlas Khan, MS, PhD

Director and Distinguished Professor,
National Centre for Natural Products Research;
Research Professor of Pharmacognosy,
University of Mississippi, Oxford, USA

“It is not easy to bridge the worlds of science and spirituality, but what sets this book apart is the care with which there is clearly demarcated reference to each. Like any good exploration, it raises more provocative questions than answers and invites a spiritual and ethical examination – a contemplative inquiry – of our very existence and a path leading to a more enlightened and harmonious future. It is difficult to encapsulate in a few words the content of a book so vast and head-spinning in scope, but I predict it will be an enjoyable and fruitful journey for anyone who embarks on it.”

Dr Suresh V. Garimella, MS, PhD

27th President of the University of Vermont; Distinguished Professor Emeritus, Purdue University, Indiana, USA

“*Genome to Om*, is an excellent exploration on evolution and convergence between modern science and meta-science. One is awestruck with the power of observation and deduction of our sages in ancient times that enabled them to understand ourselves and the nature around and their efforts to nurture schools of learning. That seems to have enabled them to conceptualise some of the deepest questions that modern science is still struggling to resolve. Authors deserve our deep appreciation for their efforts in unfolding this journey. My compliments to the authors for putting together this book, it makes a fascinating reading on discovery efforts from ancient to modern times.”

Dr Anil Kakodkar, Padma Vibhushan

Former Chairman, Atomic Energy Commission of India; former Secretary, Government of India; former Director, Bhabha Atomic Research Centre; Chancellor, Homi Bhabha National Institute (Deemed to be University), Mumbai, India

“*Genome to Om* by Dr Bhushan Patwardhan and Indu Ramchandani takes us from the cutting edge of modern science to the timeless Vedic sciences of Yoga and Ayurveda, which reflect a higher spiritual science of universal consciousness and *prana* rooted in prime *mantric* knowledge starting with ‘Om’. This can heal body and mind and unify society promoting world peace and prosperity. The book projects a new visionary approach of great relevance to all.”

Dr David Frawley, DLitt, Padma Bhushan

Acclaimed scholar in Yoga, Ayurveda and oriental philosophy; popular author and the founder of American Institute of Vedic Studies, Santa Fe, New Mexico, USA

“Various levels of knowledge arise from human experience and others are induced through critical observation and experimentation. *Genome to Om* attempts to answer, or at least raises for discussion and conversations to understand the value of Western rationalistic thinking to human existence and the richness that faith born out of human existence can bring to humanity. After all, perhaps the most profound experience of human existence, *Love*, can neither be measured nor even proven. This book is an exploration into the two world views.”

Dr Roy Upton, PhD

President, Executive Director and Editor,
American Herbal Pharmacopoeia; adjunct faculty member,
Ric Scalzo Botanical Research Institute; Director of Herbal Research,
Planetary Formulas, Scotts Valley, CA

“The book *Genome to Om: Evolving Journey of Modern Science to Meta-Science* makes an interesting reading. It is contemporary and modern given the background and understanding of DNA, genome sequencing, research in neuroscience, lifestyle changes, and AI and yet aligned to the ancient wisdom of spiritualism, yoga, meditation, minimalism, honesty, ethics, morality, and the goal to live a healthy and happy life. The text is beautifully interwoven with this complex subject and make us think of start to live the Om way, while enjoying the benefits of Science and Technology, save the planet from imminent disaster.”

Dr Anil Sahasrabudhe

Chairman, National Education Technology Forum,
National Assessment and Accreditation Council and
National Board of Accreditation; former Chairman,
All India Council for Technical Education, Government of India

“It is a joy to see this meaningful volume being published at a very opportune time when the entire world is in a very paradoxical situation. On the one hand, humanity is enjoying all the luxuries and comforts that emerging technology is providing, while on the other, we are at such a perilous stage that we do not even know whether we will see the end of the 21st century! India is a land of great saints, sages, seers, scientists and philosophers. They gave the world some of the greatest attributes, which include spirituality, Yoga, Aum, and nonduality. Swami Vivekananda had prophesied, “The union of science and spirituality alone will bring harmony and peace to mankind.”

I endorse and compliment the authors for their diligent effort to reveal the same through *Genome to Om*.”

Dr Vishwanath D. Karad

Founder President,
MAEER's MIT World Peace University, Pune, India;
former Professor of Mechanical Engineering,
COEP Technology University Pune

“*Genome to Om* is a rare and much-needed book bringing hope to the future of humanity and science. This book provides insights from science, meta-science, ethics, and spirituality, acknowledges the interconnectedness of all things, and emphasizes a holistic approach to scientific inquiry into understanding life and its pursuits. I feel this is a must-read for everyone.”

Dr Amarjeet Singh Bhamra

All-Party Parliamentary Group on Indian Traditional Sciences,
Houses of Parliament, London

“The book resonates deeply with the ground-breaking work of Prof. Brian Josephson. Just as his research has pushed the boundaries of our understanding of mind-matter unification, this exploration of the evolutionary journey from modern science to meta-science promises to challenge existing paradigms and inspire new ways of thinking. Authors have seamlessly weaved together themes of science, consciousness, and metaphysics embracing a holistic approach to knowledge. I am excited to see how these insights contribute to the ongoing dialogue surrounding the interconnectedness of science and spirituality. Congratulations to the authors on creating a work that forges new pathways for future scientific inquiry. It is sure to captivate readers and spark meaningful discussions in the realms of academia and beyond.”

Dr Madan Thangavelu

Genome biologist;
General Secretary and Research Director, EUAA
(European Ayurveda Association),
Cambridge, UK

“One of the most perplexing and profound approaches to the understanding of the world around as practiced over ages in India and associated cultures is fundamentally different from Western philosophy. The Indian approach does not consider human beings as separate

entities from nature. “Genome to Om” is a well-studied endeavour in which the readers will appreciate the integral approach of science and insightful thought process where the universe in totality is attempted to be understood. I congratulate the authors for putting together such a thoughtful text which makes a very interesting reading.”

Dr Shekhar C. Mande, FNA, FASc, FNASc
President, Vijnana Bharati; Distinguished Professor,
Bioinformatics Centre, Savitribai Phule Pune University, Pune, India;
JC Bose Fellow and Honorary Distinguished Scientist,
National Centre for Cell Science, Pune, India;
former Director General, Council for Scientific and Industrial Research;
Secretary S&T, Government of India

“*Genome to Om* is a profound exploration of our current scientific landscape and its potential evolution. This book is a visionary guide, urging us to transcend traditional boundaries of empirical science. It challenges us to consider how we understand the universe and our place within it. Through meticulous scholarship and compelling prose, the authors illuminate the path toward a meta-society that harmonizes technological advancement with timeless values. This book is a manifesto for the future, advocating a balanced integration of cutting-edge innovation and spiritual enlightenment.”

Dr Rajiv Kumar
Former Vice Chairman, NITI Aayog;
Chairman, Pahle India Foundation, Delhi, India

“*Genome to Om* is an insightful book that highlights the need for a holistic approach, including ethical, moral, and spiritual insights. It emphasizes the contemporary value of the Upanishads, Yoga, and other ancient knowledge sources in recalibrating our current development path towards a more sustainable environment, peace, and well-being. This motivates readers to think about how technological progress, combined with timeless values, can lead to a future that is not only innovative but also spiritually enriched and ethically grounded. I wholeheartedly endorse this book and believe it will serve as an inspiring guide for those committed to advancing knowledge while honouring the profound interconnectedness of all life.”

Dr Suresh Prabhu
Chancellor, Rishihood University;
former Cabinet Minister, Government of India,
with several portfolios including Environment & Forest,
Commerce & Industry, Civil Aviation & Railways

“Vast intimidating canvas reflecting ancient insights and modern discoveries.”

Drs Ashok and Rama Vaidya

Eminent physician scientists;
Alumni of Seth GS Medical College and Yale Medical School

“The book provides a path to integrating traditional wisdom with modern scientific discoveries, offering practical applications for personal and societal well-being by delving into the Om Way. This scholarly work is a valuable contribution to the ongoing dialogue between science and spirituality, and I highly recommend it to open-minded scientists and intellectually curious readers interested in exploring profound questions about our purpose and existence.”

Dr Vijay Bhatkar, Padma Bhushan

Founder, C-DAC; former Vice Chancellor,
Nalanda University

Foreword

The Sapiens' Crossroads of Redemption

It is with great pleasure that I write a few words about this remarkable volume by Bhushan Patwardhan and Indu Ramchandani. Bhushan and I have been discussing such a book for almost 10 years, and in his preface, Bhushan generously acknowledges my modest contribution in reorienting and strengthening the principal theme of the book, glimpsed in its very title. We have collaborated in the past in publishing *Integrative Approaches to Health* (Elsevier 2015), a well-received and widely read volume. I consider the present work Bhushan's magnum opus, a testament to his deep knowledge.

Genome to Om is an arrow shot in the right direction, one that will further stimulate a growing dialogue around urgent remedial actions required to confront and remedy the existential problems threatening human beings and our planet. In the intricate interphase between science and spirit (metascience as referenced by the authors), *Genome to Om* offers a compelling vision of humanity's potential evolution. The authors' meticulous exploration of the scientific landscape is firmly rooted in their dedication, perseverance, and expertise. Yet, as a student of both the empirical and the esoteric, I find myself wrestling with the nuances of the narrative. While I applaud this clarion call for a transition from Genome to Om – a shift from the dominance of scientific materialism to a world view embracing compassion, ethics, and equanimity – I cannot embrace the notion that this transformation will unfold as a natural progression. The forces of human ego, greed, and self-interest, along with the corruption of vital human institutions, are deeply entrenched in our society. Democracy, our one hope for equality and freedom, is in decline in many of the advanced nations. To transcend these limitations, we require not merely an evolution but

a revolution – a conscious, deliberate reorientation of our values and priorities.

Notwithstanding these reflections, the present volume serves as a crucial catalyst for deeper conversations and radical actions that our collective redemption demands. The human story, etched into our very genome, is a tale of astounding paradoxes. We have risen from primitive origins to touching the stars, wielding technologies that reshape reality. We have conquered diseases, built sprawling cities, and enfolded the globe in a digital embrace. Yet, our primal impulses remain, driving us toward conflict, inequality, and environmental devastation. This disconnect between our progress and our peril begs a haunting question: Are we the architects of our own demise?

The Illusion of Progress

The relentless pursuit of material wealth, fame, and fleeting comforts has blinded us to our true purpose. We have prioritized the “I” over the “we”, fracturing our communities and neglecting our planet. This blind focus on the individual, while fuelling the ambition necessary for innovation, has also sown the seeds of our discontent. Unbridled consumption and consumerism threaten our very survival, fuelling climate change, ecological collapse, and deepening social divides.

Meanwhile, amidst technological and scientific prowess, we have lost touch with the wisdom of our ancestors. The timeless concept of *Om*, a symbol of universal unity and consciousness, should remind us that we are not separate from the world around us; as our actions ripple outwards, they impact not only ourselves but also the entire web of life.

Genome to Om: A Path to Redemption

The journey from Genome to Om is a call for profound transformation. It is a recognition that our current trajectory is unsustainable both for ourselves and for the planet. It is a call to awaken from our spiritual amnesia and to remember our place in the grand tapestry of existence. This is not a retreat from progress, but a re-directing. We must reimagine our institutions, economies,

and educational systems to prioritize collaboration, compassion, and long-term well-being. We must elevate leaders who embody integrity and prioritize the collective good. Above all, we must cultivate a spiritual reorientation that transcends self-interest and embraces our shared humanity.

Each of us holds within us the power to ignite change. While institutions may falter, an individual spark of conscience and courage can inspire a monumental movement. We must amplify these sparks, empowering grassroots initiatives, transforming education, and fostering a new narrative that celebrates cooperation, empathy, and our connection to nature. The challenges we face are not merely technological or economic; they are deeply spiritual. True spirituality is not about dogma or ritual but a lived experience of interconnectedness, compassion, and service to others, recognizing the spark of the divine in every living being and acting accordingly. Each breath, each action, becomes an opportunity to cultivate kindness, wisdom, and reverence for all life. By embracing our spiritual nature, we tap into a wellspring of resilience, creativity, and collective power that can guide us through this perilous crossroads.

The Path Ahead

The path to redemption will not be easy. It demands courage, sacrifice, and a willingness to confront our own shadows. But within us burns the same spark that propelled us from the caves to the cosmos—a spark of ingenuity, resilience, and boundless potential. Let us remember the ancient wisdom that speaks of our shared purpose: to nurture the well-being of all. By integrating the lessons of our genome with the timeless wisdom of Om, we can forge a new path—one that leads to a flourishing planet and a truly awakened humanity. Chanting the *shanti mantras* (peace aphorisms) is one of the great traditions of India. A *mantra* is a verse, or a set of verses, an uplifting prayer dedicated to the Spirit of Om, the universality of all nature and humanity. Let me wish godspeed to this book's clarion call for the magic and power of the Om paradigm to usher in peace and enlightenment to all sentient beings on our planet.

*Om Sarve Bhavantu Sukhinah, Sarve Santu Niraamayaah, |
Sarve Bhadraanni Pashyantu, Maa Kashcid-Duhkha-Bhaag-Bhavet |
Om Shaantih Shaantih Shaantih ||*

By the power of *Om* may all sentient beings live in happiness,
may all enjoy good health,
may joyous events fill all our lives, may there be no suffering, may
peace reign over us.

Dr Gururaj Mutalik, MD (Internal Medicine), FAMS

Eminent physician scientist, Yoga and spiritual master active at the
age of 95 at Sun City, Florida, USA; formerly professor of medicine
and Dean, B.J. Medical College, Pune; former Director, WHO
Office at United Nations, New York; former CEO,
The International Physicians for the Prevention of Nuclear War
(recipient of Nobel Prize 1985)

PLATES

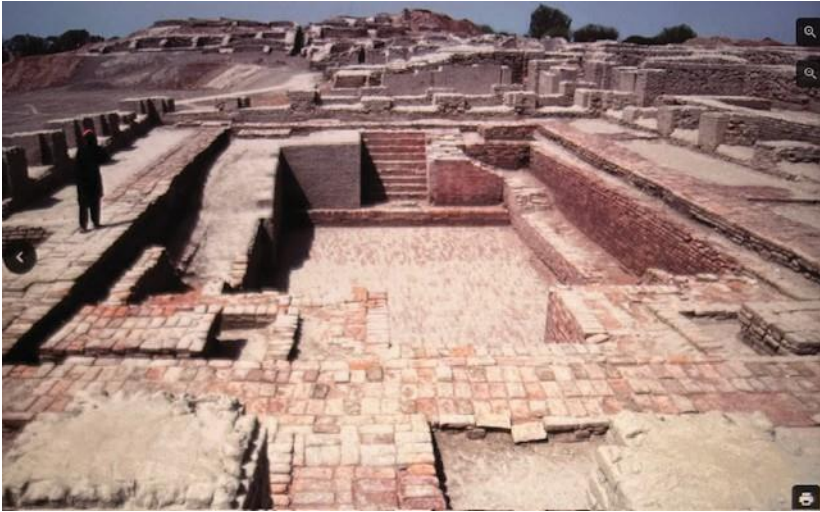


Plate 1. Great Bath at Mohenjo-daro. This structure dates to the 3rd century BCE and was believed to be used for ritual bathing.

Photograph: Frederick M. Asher. Courtesy: Alice Asher
<https://www.britannica.com/place/Great-Bath-Mohenjo-daro>.

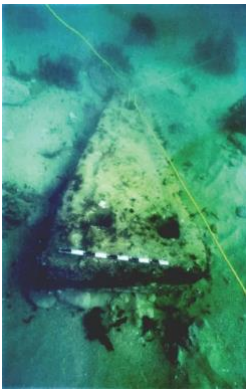


Plate 2. Underwater city Dwarka. During 1983–1990, the Marine Archaeology Unit of India's National Institute of Oceanography (NIO) carried out underwater excavations at Dwarka. The available archaeological evidence from the excavations confirms the existence of a city-state with a couple of satellite towns in 1500 BCE. Dr S.R. Rao (1991) considered it reasonable to conclude that this submerged city is the Dwarka as described in the Mahabharata.

<https://www.nio.res.in/galleries/show/dwarka>



Plate 3a. The Hubble Space Telescope (HST) floats gracefully above the blue Earth in December 1999 at the conclusion of HST servicing mission 3A.

<https://science.nasa.gov/image-detail/hubble-space-telescope-hst-4/><https://science.nasa.gov/image-detail/hubble-space-telescope-hst-4/>



Plate 3b. Hubble spots a stunning spiral. Hubble image of spiral galaxy, ngc 2985. ESA/Hubble & NASA, L. Ho

<https://science.nasa.gov/missions/hubble/hubble-spots-a-stunning-spiral/>



Plate 3c. Hubble Telescope: The Butterfly Nebula shows what happens to a star at the end of its life, when it loses all of its gas and dust to its surroundings. Not only is this a reminder to the eventual fate of our own Sun and solar system, but Hubble's unique ability to witness this event in a star's long lifecycle sheds light on how stars evolve.

https://www.nasa.gov/wp-content/uploads/2023/03/754349main_butterfly_nebula_full_full.jpg

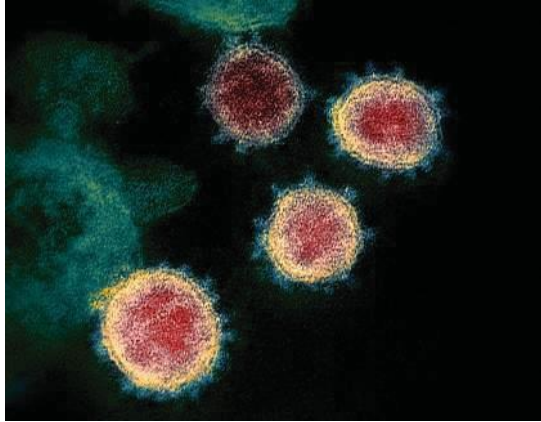


Plate 4. Transmission Electron Microscope and Corona Virus. Transmission electron microscope image shows SARS-CoV-2, the virus that causes COVID-19, isolated from a patient in the US. Virus particles are emerging from the surface of cells cultured in the lab. The spikes on the outer edge of the virus particles give coronaviruses their name, crown-like. *NIAID-RML*

<https://www.nih.gov/news-events/nih-research-matters/novel-coronavirus-structure-reveals-targets-vaccines-treatments>

https://commons.wikimedia.org/wiki/File:TEM_of_avian_infectious_bronchitis_virus_rotated_cropped.jpg



Plate 5. Dolly with Mother. Dolly, the first successfully cloned mammal, and her surrogate mother at the Roslin Institute, Edinburgh.

Photo courtesy of The Roslin Institute, The University of Edinburgh

<https://www.ed.ac.uk/roslin/about/dolly/facts/life-of-dolly>

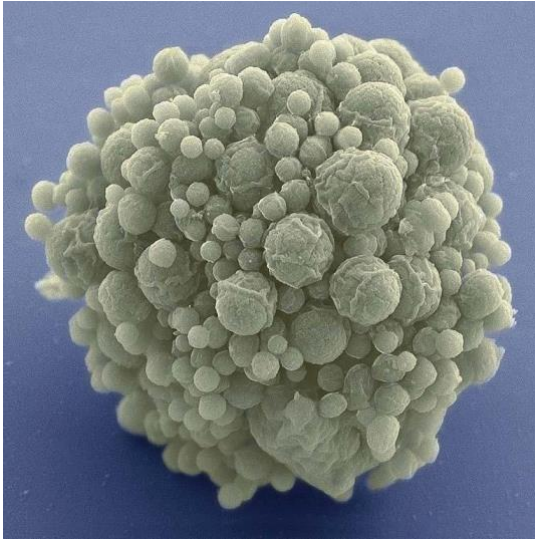


Plate 6. A cluster of synthetic cells. Electron micrograph of a cluster of minimal cells magnified 15,000 times.

Credit: Tom Deerinck and Mark Ellisman of the National Center for Imaging and Microscopy Research at the University of California at San Diego.
<https://www.jcvi.org/media-center#media-resources>



Plate 7. Six-legged mouse. A typical mouse embryo (*left*) has four limbs. Genetic engineered mouse (*right*) has six limbs (Lozovska et al. 2024).

Courtesy: Moises Mallo, MD, PhD, Instituto Gulbenkian de Ciencia, Portugal.



Plate 8. Mythological chimaera. The image of Narasimha, Lord Vishnu's avatara. Carving of Narasimha located in Hoysaleswara Temple, Halebidu, Karnataka, India.

https://commons.wikimedia.org/wiki/File:Relief_depicting_Narasimha_avatar_of_the_god_Vishnu_in_Hoysaleswara_temple_at_Halebidu.jpg



Plate 9. The three surviving re-clones at two months of age. They were derived by SCNT of adipose-derived mesenchymal stem cells (ASCs) taken from Snuppy at five years of age (Kim et al. 2017).

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5681657/>

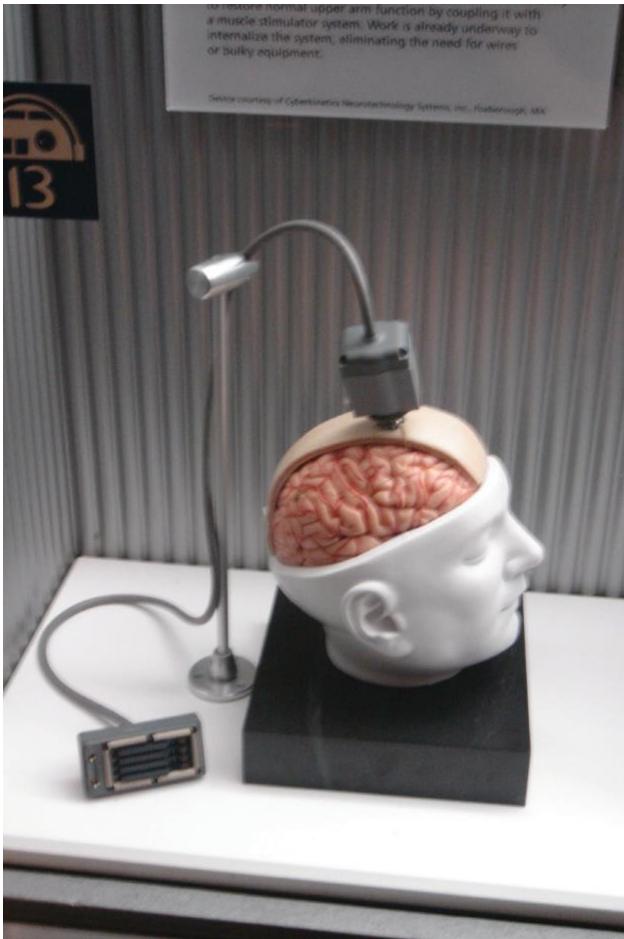


Plate 10. Dummy unit illustrating the design of a BrainGate interface.

BrainGate (2024, February 1). In Wikipedia. <https://en.wikipedia.org/wiki/BrainGate>
PaulWicks at English Wikipedia

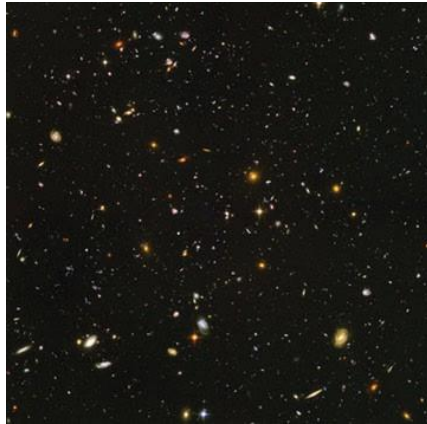


Plate 11. Hubble Ultra Deep Field (UDF) of the Milky Way. The UDF is one of the deepest views of the visible universe to date; Certainly, it was the deepest when it was originally created in 2003–2004. There are approximately 10,000 galaxies in this view. A picture of the real Milky Way taken by the satellite COBE. The COBE Project, DIRBE, NASA.

The Isaac Newton Group of Telescopes, La Palma, and Simon Dye (Cardiff University)

NASA, ESA, and S. Beckwith (STScI) and the HUDF Team

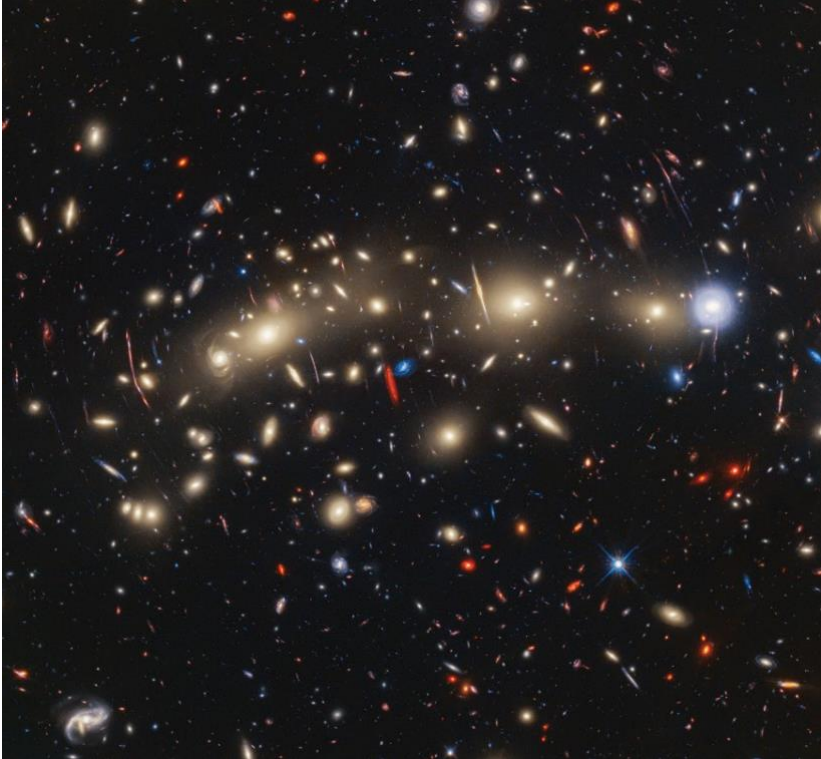


Plate 12. Hubble-Webb view of the galaxy cluster. NASA's James Webb Space Telescope and Hubble Space Telescope have united to study an expansive galaxy cluster. This is one of the most comprehensive views of the universe ever taken. Located about 4.3 billion light-years from Earth, MACS0416 is a pair of colliding galaxy clusters that will eventually combine to form an even bigger cluster. 9 November 2023 10:00AM (EST) Release ID: 2023-146

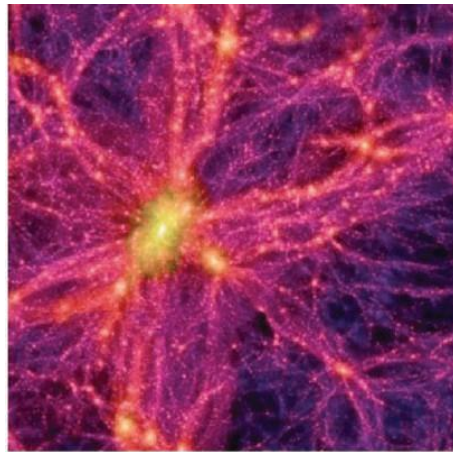
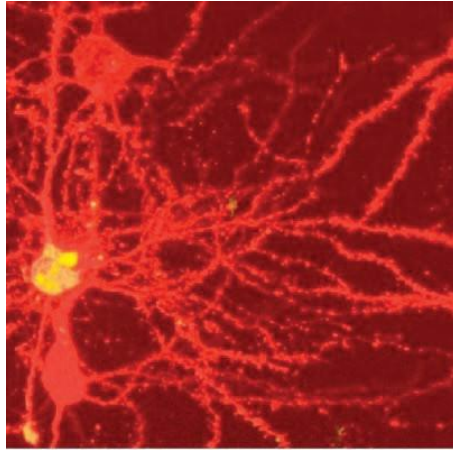


Plate 13. Galaxy and neurons. It's your guess, which is the galaxy and which are the neurons! (Top: Neurons; bottom: galaxy)



Plate 14. Nataraja at CERN Switzerland. The statue of the dancing Lord Shiva known as the Nataraja symbolizes Shakti, or life force. The statue is on permanent display at the European Organization for Nuclear Research (CERN).

Courtesy: Dr Anil Kakodkar
<https://cds.cern.ch/record/745737?ln=en>



Plate 15. Trimurti at Elephanta Caves (5th to 6th century CE), Mumbai, India, depicts Shiva in his triple role as the creator, preserver, and destroyer.

By Ronak Shah, 1990 - own work, CC BY-SA 4.0,
<https://commons.wikimedia.org/w/index.php?curid=51947717>

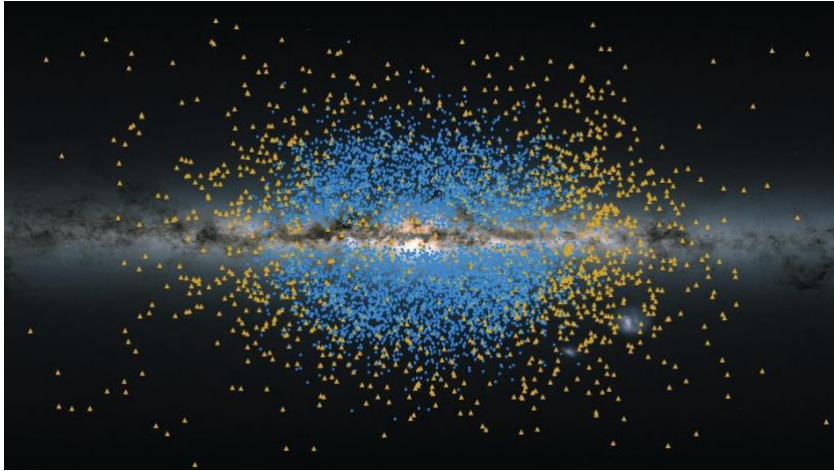


Plate 16. Shiva and Shakti, two ancient streams of stars in the Milky Way. ESA's Gaia space telescope has discovered two streams of stars named Shakti and Shiva, helped form the infant Milky Way. This image shows the location and distribution of Shakti (yellow) and Shiva (blue) stars throughout the Milky Way.

https://www.esa.int/ESA_Multimedia/Images/2024/03/Gaia_unravels_two_ancient_streams_of_stars_in_the_Milky_Way#

Credit: ESA/Gaia/DPAC/K. Malhan. LICENCE CC BY-SA 3.0 IGO or ESA Standard Licence



Plate 17. Human zygote formation: egg cell after fertilization with a sperm.

By Nina Sesina - File:Zygote.tif, CC BY-SA 4.0,

<https://commons.wikimedia.org/w/index.php?curid=67459911>

<https://en.wikipedia.org/wiki/Zygote>

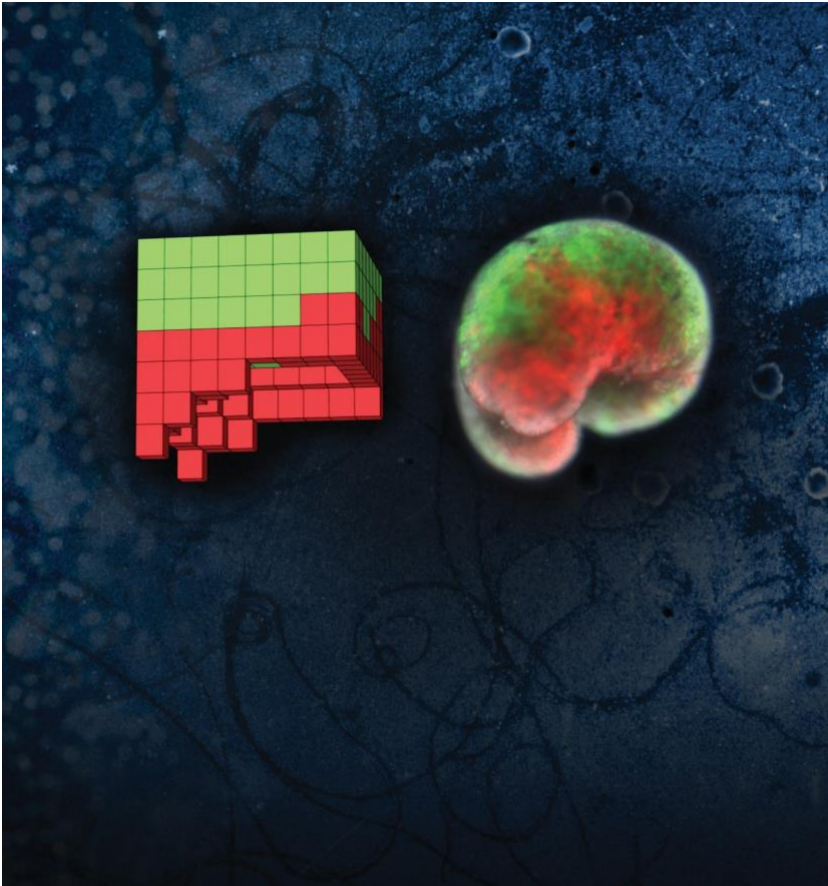


Plate 18. Xenobots. One of the over 100 computer-designed organisms. *Left:* the design discovered by the computational search method in simulation. *Right:* the deployed physical organism, built completely from biological tissue [frog skin (green) and heart muscle (red)]. The background displays traces carved by a swarm of these organisms as they move through a field of particulate matter.

Courtesy: Douglas Blackiston and Sam Kriegman.

Courtesy: Professor Joshua Bongard, University of Vermont,

<https://drive.google.com/drive/folders/1m2ZnuFK0BUGeozVG5K4NKPVOKoDVSmaAy>

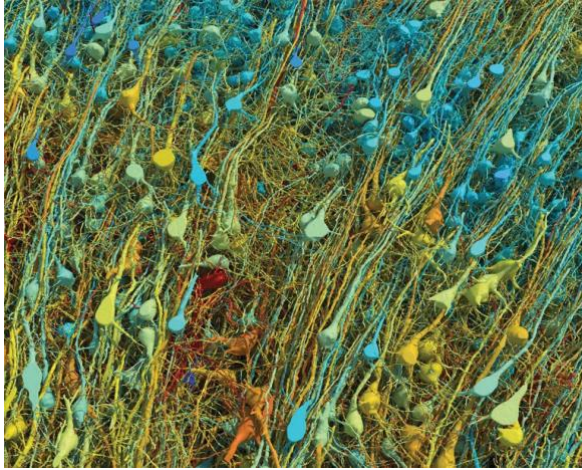
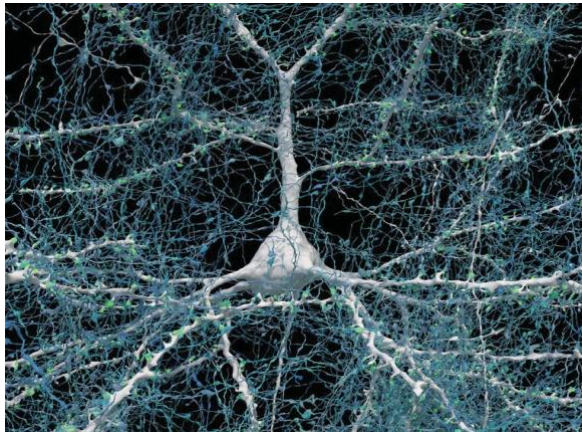


Plate 19. Amazing neural network.

(a) Rendering based on electron-microscope data, showing the positions of neurons in a fragment of the brain cortex. Neurons are coloured according to size.

Credit: Google Research & Lichtman Lab (Harvard University). Renderings by D. Berger (Harvard University)



(b) A single neuron (white) shown with 5,600 of the axons (blue) that connect to it. The synapses that make these connections are shown in green.

Credit: Google Research & Lichtman Lab (Harvard University). Renderings by D. Berger (Harvard University)

Courtesy: Dr Jay Lenon



Plate 20. Samudra Manthan. A huge mural at Suvarnabhumi International Airport, Bangkok shows the legend of the churning of the ocean with the mountain Mandara and the giant Vasuki snake.

THE SUSTAINABLE DEVELOPMENT GOALS



Plate 21. United Nations Sustainable Development Goals 2030.

Glossary of Vedic Terms

Ahimsa, the principle of non-violence that applies to action towards all living beings. In the deepest sense, it is about the intent more than the action itself. It is an attitude of universal benevolence.

Ajiva, non-living matter; inanimate, lifeless.

Anahata, also *anahat*, the unstruck, timeless sound of the universe expressed as Om.

Anubhava, the “experiential knowledge”, direct perception or cognition, similar to the concept in modern science, emphasizes observation, experimentation, and analysis. *Anubhava* is experiencing through the senses and the mind. What we perceive through our sense organs and the experience of the perceptions is *anubhava*. It also refers to knowledge or skills gained through doing a job or activity. In Vedanta, it is intuition, or experience of an individual’s awareness of knowledge of Brahman, the Absolute. It is the knowledge gained or apprehended through experience, as opposed to that as recalled by memory or *smriti*.

Anubhuti, the “sensory and emotional response”, knowledge based on direct perception, inference, and comparison. *Anubhuti* is a subjective or emotional feeling. It is a feeling, an independent phenomenal experience. It is a general insight caused by a particular experience, a realization or a mental experience.

Apara Vidya, knowledge focused on the finite world based on the intellect and senses.

Ashtanga Yoga, the practice of Yoga, as divided into “eight limbs”; each limb is developed to bring the body and mental energy under control. The core of the eight limbs is *ahimsa*, non-harming, which can be considered the foundation of the eight limbs. *Yama* and *Niyama* focus on ethical principles and self-discipline. *Asana*, a range of physical postures that improve

strength, flexibility, resilience, and mind-body connection. *Pranayama*, the yogic art of breath control, refines the flow of energy and sharpens focus to link the body and mind. Using specific breathing patterns such as inhaling, exhaling, and holding the breath in regimented ways, the practice improves the flow of *Prana*, the life force in the body, and gives a range of other wellness benefits. *Pratyahara*, the withdrawal of the senses, directs attention inwards, while *Dharana*, concentration, holds that focus on a single point. *Dhyana*, the seventh limb signifies a state of deep meditative absorption, where the mind transcends focus on a single point and becomes effortlessly one with the object of contemplation. It deepens the state of inner awareness. Finally, *Samadhi* is the culmination, a state of complete absorption and liberation.

Astika, from the Sanskrit word, *asti*, meaning there is or there exists; theist, one who accepts the authority of the sacred scriptures. There are six *astika* schools (*darshanas*) of Hindu philosophy: Nyaya, Vaisheshika, Sankhya, Yoga, Mimamsa, and Vedanta.

Atman, a very basic concept in Hinduism, and in the Vedanta philosophy. It refers to the inner and real Self, the core of the living being, the very essence. The Atman is indestructible and inseparable from the Universal Self, Brahman. It is the underlying essence of the individual being, identical to the eternal core of the personality that after death either transmigrates to a new life and a new body-mind complex, or is freed from the cycle of *samsara*, by attaining *moksha*, or liberation from the bondage of existence, merging eternally into Brahman.

Avatara, incarnation, or material appearance. In Indian philosophy, it specifically refers to the reincarnation of a deity or realized soul, as a messenger to help humanity. In Hinduism, it refers to the ten reincarnations of Lord Vishnu.

Bhakti Yoga, the path of devotion. The devotee surrenders completely to God, to his or her chosen ideal and with complete faith and surrender takes everything that comes in life as "God's will". This kind of faith does not question, nor doubt. But it is not blind faith driven by fears or superstitions. This is the path of pure love, and the follower attains *moksha*

or 'merges' with his or her chosen ideal and is freed from the bondage of *samsara*.

Brahman, the supreme, unchanging, omniscient, omnipresent, universal reality. It is the eternal principle irreducible core of existence-consciousness-bliss, *sat-chit-ananda*. Brahman is nondifferent from its manifestation or projection, the universe, the world. It is the cause of all creation, maintenance, and destruction. The 'Om' symbol represents the essence of Brahman.

Chakra, the centre of energy in the subtle body as indicated in Yoga. The seven centres, from the *Mooladhara* (at the base of the spine), *Swadhisthana* (in the sacral bone), *Manipura* (at the navel), *Anahata* (in the chest or heart region), *Vishuddha* (in the throat), *Adnya* (the forehead), and *Sahasrara* (top of head) are connected by several *nadis*, the channels through which the life force or vital energy moves.

Chitta, mind, state of mind or mindset, or to be conscious. In Vedanta, the subconscious and unconscious mind is called *Chitta*. It is considered the unconscious storehouse or reservoir of all impressions. Recognizing the movements of thoughts is imperative to control the flow of random or uncontrolled thoughts in the mind.

Chitta vritti nirodhah, the cessation of the fluctuations of the mind. This is emphasized in the second aphorism of the Yoga Sutras by Patanjali. It points out that Yoga ensures the control of the movements of the mind, and stresses the importance of keeping the mind in control

Darshana, literal meaning, a glimpse of a view. In Hindu philosophy, school or principal system of philosophy: Nyaya, Vaisheshika, Sankhya, Yoga, Mimamsa, and Vedanta.

Dosha, the three fundamental principles or humors in Ayurveda, Kapha, (phlegm) Pitta (bile), and Vata (wind). They correspond to the elements of nature, of water, fire and air, respectively. These *doshas* are said to be responsible for the physiological, mental and emotional health of human beings.

Ekam Sat Vipra Bahudha Vadanti, the truth is one, the wise give it different names. This statement from the Rig Veda rings all the truer today, as unity in diversity is the goal.

Garbha samskara, derived from the two Sanskrit words, *garbha* (meaning the womb, and thus foetus in the womb) and *samskara*, is educating the mind, dealing with the imprints and impressions. Traditionally, it is believed that a child's mental development starts at conception because it already has brought forward past impressions.

Guna, a tendency of the mind, body, and consciousness; the individual attributes and qualities. There are three *gunas* that are present in every human being in different ratios or proportions, and they indicate behavioural and thinking patterns; they are also connected to mental and physical health. *Satva guna* manifests as purity and goodness; calm and harmonious; *Raja guna* manifests as passion, hectic activity, and restlessness; *Tama guna* displays as inertia, ignorance, laziness, and tardiness. All these attributes of energy are present in every person in different proportions, often with one *guna* predominating at a time. The mental state of a human being can vary as well between the three states of energy. Foods are also identified as being either *sattvic*, *rajasic*, or *tamasic*, and a prudent choice of appropriate foods is always recommended for good health and well-being.

Jeevo Jeevasya Jeevanam, the life of one being is dependent on that of another living being. All living beings are connected. The link of the food chain has a deep significance and must not be ignored. The web of life concept is rooted in this Vedic concept.

Jiva, a living sentient being. Most *jivas* are bound to the cycle of *samsara*, to the cycle of birth and death, based on their karmic cycle.

Jivatma, an individual soul, the "self", which identifies itself as a *jiva*, the embodied being, connected as it is to the psychophysical system.

Jiva-mukta, the realized soul or being, the atman, who lives in the world as a realized perfected being, finishing off the final karmic deeds before giving up the physical body to attain final liberation, never to be born again.

Jnana, (also *gyan*) knowledge. In the realm of Indian philosophy, *jnana* is spiritual knowledge or wisdom, the kind of knowledge that is a total experience or awareness of its object.

Jnana Yoga, the path or discipline of knowledge or self-realization, through intellectual inquiry and study of the true Self.

Kaivalya, a state of aloneness, isolation, and solitude. The person who attains this state is completely detached from the material world. This is the prime goal of those practising Raja Yoga. The individual is free of all relationships, devoid of ego and arrogance; and is free from the karmic cycle of birth and death. To achieve this state the disciple performs austerities and follows the practice of yoga very earnestly. He or she must isolate himself or herself from the external world. The person who attains this state of pure consciousness is in a state of *kaivalya*.

Kapha, one of the *doshas*, characterized by the qualities of earth and water. People with a predominant *Kapha* constitution are calm, compassionate, and nurturing. They have a sturdy build, smooth skin, and slow digestion. Balanced *Kapha* provides stability, strength, and immunity.

Karma, action, deed, also the result of action. The word originates from the Sanskrit verb, *kri*, which means "to do". *Karma* is also driven by the law of cause and effect. Every action has an effect. Whatever actions we perform, with whatever intent, the kind of mental motivation we have while performing any action, and the impressions they leave on our lives and on the lives of those around us contribute to the results of *karma*. Good, selfless deeds generate good *karma*; self-centred, actions motivated by personal benefit, especially with disregard of the impact on the world around us, generate a negative balance in the *karma* count! Nature gives back to us what we give to it.

Karma Yoga, one of the paths of four Yogas, Karma Yoga, is the yoga of selfless action or dedicated work. We perform actions all the time. The work done to benefit others, without any desire for the fruits thereof for oneself, is the path of this yoga. We can break the bondage of the chain of cause and effect by performing *nishkaam karma* (selfless action). It is essential to disengage the ego and the individual self and offer the results of all our actions either to a higher being, to self-realization, or in the service of the divine in other beings.

Kosha, sheath or covering. According to Vedanta philosophy, the explanation given for the human framework is that it is encased in five sheaths that cover the real inner Self, the Atman. It is through these five layers that one goes through all experiences. The first is the *Annamaya kosha*, comprising the physical body, which is entirely matter and is nourished by food. *Pranamaya kosha* is the vital energy or life force, but it is not the real identity of the human being. *Manomaya kosha* is the level of the mind and all its activities. *Vijnanamaya kosha* is the fourth layer of reality, cognition, intellect, and wisdom. That again is the activities of the human being, not the true Self. The fifth, the *Anandamaya kosha*, is the innermost layer, or the level of bliss. The person is in a state of harmony and health without the vacillations of thoughts and emotions.

Kundalini, said to be the cosmic power in individual human beings. It is a vital life force, an energy, a spiritual potential of a dynamic energy, that is concentrated as a dormant force, 'located' at the base of the spine. It is visualized as a sleeping serpent lying coiled up there. It is awakened and raised through yogic methods of meditation as specified in Raja Yoga. This energy rises through the spine in a channel called the *Sushumna*, in the subtle body and it activates the seven centres of energy in the body, the *chakras*.

Mahavakya, Great Statement, a declaration found in the Upanishads. The great sayings or aphorisms of Vedanta convey the same thought of the oneness of all, and that the Atman and Brahman are the same. The self-realized individual being, in its pure essence, is the same as the universal reality. The four primary *mahavakyas* are:

Tat Tvam Asi – That Thou Art, from the Chandogya Upanishad of the Sama Veda.

Aham Brahmasmi – I am Brahman, from the Brihadaranyaka Upanishad of the Yajur Veda.

Prajnanam Brahma – Consciousness is Brahman, from the Aitareya Upanishad of the Rig Veda.

Ayam Atma Brahma – This Self, the Atman, is Brahman, from the Mandukya Upanishad of the Atharva Veda.

Maya, in the Advaita Vedanta school of Indian philosophy, is a fundamental concept that means ‘appearance’ or ‘ignorance’. It’s a powerful ‘veiling’ force of Nature, that creates the illusion that the phenomenal world is real. At the individual level, Maya’s veiling power is the *jiva*’s lack of knowledge of the real Self, Atman-Brahman, and its identification with the body-mind complex. Maya is a simple statement of facts – what we are and what we see around us. Maya’s revealing power gives absolute reality to what we perceive, which is at best the seeming reality. The delusion that clouds our understanding of reality is Maya.

Moksha, freedom or liberation from *samsara*, the cycle of birth and death. Psychologically, *moksha* means being free from ignorance of our identity, knowing who we are, being clear about the purpose of life, and moving towards the state of self-realization. *Moksha* is the final goal as we progress in the four paths of life; it is the goal to move towards, even as we work our way through the world and all our commitments.

Nadi, channel or pathway of *prana*, vital energy, in the subtle body. There are three main *nadis* within the spinal cord, through which the vital force of energy, the *Kundalini* rises: *Ida* (right) and *Pingala* (left) and they run parallel to the *Sushumna nadi*. The *Kundalini*, the supreme energy, rises from the *mooladhara* through the *Sushumna nadi*. When it reaches the *sahasrara*, then the Yogi gets detached from the body and mind. There are said to be 72,000 *nadis* in the human system that work as channels or pathways of energy in the system.

Nastika, atheist, the one who does not believe in God; non-acceptance of the “Self”. There are three *nastika* schools of philosophy: Charvaka, Buddhism, and Jainism.

Nirvana is the supreme goal, the same as *moksha* and *kaivalya*. The Sanskrit term *nirvana* is associated with Buddhism. Gautama Buddha sat under the Bodhi tree in deep meditation till he could understand and realize the purpose of life. He attained *nirvana*, which means the complete wiping out of desires, of

all emotions, and of all suffering. It is the ultimate state of self-realization and ends the cycle of birth and death. In his sermons, the Buddha talked of the cessation of suffering and that leads to *nirvana*. The concept of cessation of suffering is explained by the Buddha in his tale of the two arrows. We get pierced by two arrows in life. One that the world or nature throws at us, of physical suffering, ageing, what people cause, and ultimately death. The results of that arrow cannot be avoided. But the second arrow is our response or reaction to the impact of the first arrow. That is in our control. With the cessation of emotional reactions and all negative emotions we overcome everything and thus are free.

Pancha Mahabhoota, the five basic, fundamental elements, of the universe: earth, water, fire, air, and ether. Knowing of the five elements, the practitioners of Yoga try to understand the laws of nature and focus on assuring greater health, power, knowledge, wisdom, and happiness.

Para Vidya, the higher or spiritual knowledge essential for understanding the universe, our lives on Earth, and ourselves.

Pitta is a *dosha* associated with the qualities of fire. *Pitta*-dominant individuals are ambitious, focused, and passionate. They tend to have a medium build, fair or ruddy complexion, and strong appetite. *Pitta* governs the digestion, metabolism, and regulation of the body temperature.

Prajnana, meta-science; the term stands for higher order, inner profound knowledge, wisdom, ultimate reality, or Brahman.

Prajnanam Brahma, a *mahavakya*, Great Statement, meaning "consciousness is supreme".

Prakriti, nature, the basic cosmic material, the root of all beings. The general meaning of *Prakriti* is nature, constitution, and general characteristics. In Sankhya philosophy, *Prakriti* is the root of all beings and combines with *Purusha*, to create the universe. *Prakriti* is also seen as the First Cause, all aspects of the reality of the manifested material world. It is the principle of matter.

Prana, in Sanskrit, literally means "life force" or "life energy", and that which connects all beings, suggesting an underlying unity

in the diversity of life. *Prana* is the subtle energy that permeates all forms of life. It is the principle of vitality that flows through living beings. It is often associated with breathing but is considered more than just the physical aspect of breathing.

Pranayama, the technique of controlling the vital flow of energy, through breathing.

Prayopavesha, the resolve to die through fasting. Those persons who have completed their responsibilities and have no desires left, opt to leave the body. This finds approval in cases of terminally ill people.

Preyas, that which brings immediate gratification. It is that which gratifies the senses and is instantly pleasurable. This is taken in contrast to *Shreyas*.

Purusha, the cosmic entity or Being, exists beyond the realms of time and space, the pure consciousness or conscious energy that governs life and reality. The Self, the universal principle, is synonymous with Brahman. It is the eternal, indestructible formless and all-pervasive Universal Principle. In Sankhya philosophy, *Purusha* is the principle of consciousness, the conscious witness, the cosmic principle that manifests and unites with *Prakriti* and projects nature and the material world with which all human beings relate.

Raja Yoga, a scientific approach of controlling thought waves, with a focus to transforming mental and physical energy into spiritual energy. The main practice of *Raja Yoga* is meditation. According to *Raja yoga*, *kaivalya*, *moksha*, or *nirvana* is the final stage of enlightenment that a yogi can reach. In this state, the yogi becomes completely fearless and free. Although sometimes wrongly perceived as negation or annihilation, these are the ideal states of total awareness.

Samadhi, a state of body-mind stillness, attained in deep meditation, when the individual is completely absorbed in contemplation or in an undisturbed state of 'thoughtless-ness'. With attention focused on the Absolute, the mind is undisturbed and remains single-pointed. It is also a state of joyfulness, calmness, but remaining in full mental alertness.

Samsara, (also *sansara*), is central to the concept of reincarnation, metempsychosis; it represents the cycle of birth, death, and rebirth, which is dependent on the individual's past and present deeds (*karma*). The goal of every *jiva* is to get out of the bondage of *samsara* and attain *moksha*.

Samskara, (also *sanskara*), impression or imprint left on the mind-body by education, upbringing, nurturing, and experiences. The imprints on the mind can be positive or negative and they shape predispositions, behaviour, and even the future life paths. *Samskara* also involves a more metaphysical transmission through *karma* and rebirth.

Santhara, a tradition in Jainism of fasting until death.

Shiva-Shakti, the concept is that Shiva represents the masculine energy and is associated with consciousness, while Shakti represents the feminine energy and is associated with energy and power. Together, they create the dynamic interplay of opposites that is essential for spiritual growth and self-realization. Shiva represents the basic elements of the universe, and Shakti makes the elements come to life and act

Shreyas, that which brings long-term joy, happiness, and well-being. This is taken in contrast to *Preyas*.

Shunya, or *shunyata*, the concept of empty, nothingness, or void. The Buddha pointed to the emptiness of the world, that it was momentary, transitory and that it was full of *dukkha*, sorrow.

Siddhi, extraordinary and extrasensory power or ability that can arise from deep spiritual and yogic practice. The Sanskrit word *siddhi* means "perfection", or to attain. These powers are said to be the natural consequence of very austere and sincere yogic practices and are acquired in the advanced stages of concentrated yoga practices. These powers can range from telepathy and clairvoyance to more "magical" profound abilities like changing the physical form, or levitation, reading other minds, and divine vision. However, within the yogic tradition, *siddhis* are addressed with strong words of caution, as they can become distracting powers that take the yogi away from the path of self-realization and *moksha*, if they become focal points in boosting the individual ego.

Sushumna, the central *nadi*, channel, connects the seven *chakras* starting from the *mooladhara* (at the base of the spine) to the *sahasrara chakra* (the top of the head) in the subtle human body. With the concentrated practice of Ashtanga Yoga, meditation, and psychic control, the practitioners can raise the vital force of the *Kundalini* through the *Sushumna* and open up the *chakras*, to be able to go beyond the limitations of the psychophysical system and attain *moksha*.

Swasthya, good health and well-being, or a state of “balanced within the self”. To stay in good health, all the *doshas*, the energies that *define* the individual’s physical makeup, must be balanced. The digestive system, the body tissues and waste must function normally, the sensory and motor organs must be in harmony and the mind must be in a tranquil state.

Upanishad, the philosophical teachings of the Vedas. These are a collection of Hindu scriptures, the knowledge sections of the Vedas, the core of the Vedanta Philosophy, and the texts found at the end of the Vedas (Ved-anta). Literally, it means, “being seated next to the teacher”, indicating the *guru-shishya parampara*, the method of teacher-student tradition, following the mentoring, which was originally an oral teaching tradition, with the student staying near the teacher. There are said to be 108 or even more Upanishads but among the primary ten are: Brihadaranyaka, Chandogya, Katha, Kena, Aitareya, Taittiriya, Prashna, Isha, Mundaka, and Mandukya.

Vasudhaiva Kutumbakam, an Upanishadic phrase, which means the world is one family. It emphasizes the global perspective of universal well-being.

Vata, a *dosha* characterized by qualities of air and ether (space). Those with a dominant *Vata* constitution tend to be lively, creative, and enthusiastic. Typically, they have a light build, dry skin, and irregular digestion. *Vata* governs movement in the body, including circulation, breathing, and elimination.

Veda, ancient and sacred Hindu scripture, said to be the oldest in the world, written in Sanskrit. Even today, no definite date is ascribed to these scriptures. The classic dating is of about 1500–1200 BCE. While several scholars today are increasingly dating

Glossary of Vedic Terms

these scriptures as 8,000 years old. There are four Vedas: Rig Veda, Sama Veda, Yajur Veda, and Atharva Veda, each Veda consists of four parts: Samhitas (hymns), Brahmanas (rituals), Aranyakas (meditations), and Upanishads (philosophical teachings). The Rig Veda is said to be the knowledge of the verses; Yajur Veda is the knowledge of the sacrifice; Sama Veda is the knowledge of the chants. These three Vedas are collectively known as the *trai-vidya*, or the threefold knowledge system. The fourth Veda, Atharva Veda is a collection of hymns, incantations, and even magic spells.

Vidya stands for information and knowledge.

Vijnana, (also *Vigyan*), the specialized worldly knowledge, empirical science.

Yoga, the theory and practice based on the concept of the union of the body-mind, a series of physical, mental and spiritual practices. The focus is to still the mind and ensure inner balance and detachment.

Yoga Sutras, a collection of 195 aphorisms focused on the theory and practice of Yoga, compiled by Sage Patanjali, in the early centuries of the Common Era.

Bibliography

- Alexander, Eben. *Proof of Heaven: A Neurosurgeon's Journey into the Afterlife*. UK: Piatkus, 2012.
- Aristotle. *De Anima*. Kindle edition. Penguin, 2004.
- Bakshi, G.D. *The Sarasvati Civilisation*. New Delhi, India: Garuda Prakashan Pvt. Ltd, 2019.
- Bodeker, Gerard and Chi-Keong Ong. *WHO Global Atlas of Traditional, Complementary and Alternative Medicine*. Vol. 1. World Health Organization, 2005.
- Bostrom, Nick. *Superintelligence: Paths, Dangers, Strategies*. Oxford, UK: Oxford University Press, 2016.
- Bronowski, Jacob. *The Ascent of Man*. Paperback edition. London: BBC Books, 201. <https://www.bbc.co.uk/programmes/b00wms4m>
- Capra, Fritjof. *The Tao of Physics*. India: HarperCollins, 2007.
- Chalmers, David J. *The Conscious Mind: In Search of a Fundamental Theory*. New York, USA: Oxford University Press, 1996.
- Chalmers, David J. *The Character of Consciousness (Philosophy of Mind)*. Illustrated Edition. USA: Oxford University Press, 2010.
- Clynes, Manfred and Nathan S. Kline. "Cyborgs and Space," 1960. [Cyborgs-manfredclynes-nathan s-kline-in-astronautics.pdf](#)
- Cronin, Lee. *Future Life*. University of Glasgow. <https://www.gla.ac.uk/research/beacons/futurelife/professorleecronin/>
- Danino, Michael. *Lost River: On the Trail of the Sarasvati*. India: Penguin, 2010.
- Darwin, Charles. *On the Origin of Species*. 1859.
- Dawkins, Richard. *The Selfish Gene*. 4th edition. UK: Oxford University Press, 2016

Bibliography

- Descartes, Rene. *The Complete Works of Rene Descartes*. Kindle edition.
- Divyanandaprana, Pravrajika. *The Science of Happiness*. New Delhi, India: Ramakrishna Sarada Mission, 2020.
- Eagleman, David. *Incognito: The Secret Lives of the Brain*. Reprint edition. New York, USA: Vintage Books, 2012.
- Einstein, Albert. *The World as I See It*. New York, USA: Citadel, 2006.
- Erikson, Erik, H. *Identity, Youth and Crisis*. New edition. New York, USA: W.W. Norton & Company, 1995.
- Freud, Sigmund. *The Unconscious*. UK edition. UK: Penguin Classics, 2005.
- Freud, Sigmund. *Beyond the Pleasure Principle*. The standard edition. New York, USA: W.W. Norton & Company, 1990.
- Ganesan, A., Gauthaman, J., and Kumar, G. "The Impact of Mindfulness Meditation on the Psychosomatic Spectrum of Oral Diseases: Mapping the Evidence." *Journal of Lifestyle Medicine* 12, 1 (2021), 1–8. <https://doi.org/10.15280/jlm.2022.12.1.1>
- Hancock, Graham. *Fingerprints of the Gods: The Evidence of Earth's Lost Civilization*. Canada: Anchor, 1998.
- Hawking, Stephen and Leonard Mlodinow. *The Grand Design*. UK: Bantam Books, 2011.
- Holt, Jim. *Why Does the World Exist?* London: Profile Books Ltd, 2012.
- Hegde, B.M. *What Doctors Don't Get to Study in Medical School*. 4th edition. New Delhi: Paras Medical Publisher, 2019.
- Infurna, F.J., et al. "Loneliness in midlife: Historical increases and elevated levels in the United States compared with Europe." American Psychological Association, 2024. <https://psycnet.apa.org/record/2024-59761-001?doi=1>
- Jung, Carl, G. *Man and His Symbols*. 12th edition. Kathmandu, Nepal: Rhus Publishers, 1968.
- Jung, Carl. G. *Memories, Dreams, Reflections*. Re-issue edition. Kathmandu, Nepal: Rhus Publishers, 1989.
- Koch, Christof. *Biophysics of Computation: Information Process in Single Neurons*. Computational Neuroscience Series. Oxford University Press, 2004.

Bibliography

- Koch, Christof. *The Feeling of Life Itself: Why Consciousness Is Widespread but Can't Be Computed*. Audiobook. 2020.
- Kurzweil, Ray. *The Singularity Is Near: When Humans Transcend Biology*. London: Penguin Books, 2006.
- Maharishi, Sri Ramana. *Who Am I?* CreateSpace Independent Publishing Platform, 2016.
- Mashelkar, R.A. and R. Pandit. *From Leapfrogging to Pole-vaulting*. Gurugram, India: Penguin Viking, 2019.
- Miki, Keira. *Ikigai: Japanese Art of Staying Young, While Growing Old*. New Delhi, India: Diamond Books, 2022.
- Nagel, Thomas. "What Is It Like to Be a Bat?" *The Philosophical Review* 83, 4 (Oct. 1974), pp. 435–450.
- Nagel, Thomas. *Mind and Cosmos: Why the Materialist Neo-Darwinian Conception of Nature Is Almost Certainly False*. New York, USA: Oxford University Press, 2012.
- Oparin, A.I. *Origin of Life*. New York: Dover Publications, Inc., 1953.
- Patwardhan, Bhushan, Gururaj Mutalik, and Girish Tillu. *Integrative Approaches for Health: Biomedical Research, Ayurveda and Yoga*. Netherlands: Academic Press, Elsevier Science, 2015. <https://www.sciencedirect.com/book/9780128012826/integrative-approaches-for-health#book-info>
- Penrose, Roger. *Cycles of Time: An Extraordinary New View of the Universe*. London, UK: Vintage, 2011.
- Pert, Candace B. *Molecules of Emotions: Why You Feel the Way You Do*. New York: Scribner, 1997.
- Prabhakar, V.H. *Vedic Astronomy (Vedaanga Jotisha)*. Nagpur: Shri Babasaheb Apte Samarak Samiti, 1989. <https://archive.org/details/VedangaJyotisha/page/n5/mode/2up>
- Prigogine, Ilya. *Being to Becoming: Time and Complexity in the Physical Sciences*. New York: W.H. Freeman & Co, 1980.
- Prigogine, Ilya. *The End of Certainty. Time, Chaos and the New Laws of Nature*. New York: Free Press, 1996.
- Rajaram, N.S. *Sarasvati River and the Vedic Civilization*. Aditya Prakashan, 2007.
- Reich, David. *Who We Are and How We Got Here: Ancient DNA and the New Science of the Human Past?* Oxford: Oxford University Press, 2018.

Bibliography

- Ridley, Matt. *Genome: The Autobiography of a Species in 23 Chapters*. HarperCollins, 2006.
- Riehl, John. "The Roots of Human Awareness." *Iowa Now*, 22 August 2012. <https://now.uiowa.edu/news/2012/08/roots-human-self-awareness>
- Sagan, Carl. *Cosmos*. London: Abacus, 1995.
- Sagan, Carl. *Pale Blue Dot: A Vision of the Human Future in Space*. Balantyne Books, Inc., 1997.
- Samples, Bob. *The Metaphoric Mind*. 2nd edition. Fawskin, USA: Jalmar Press, 1993.
- Saradananda, Swami, ed. *Sri Ramakrishna the Great Master*. Trans. Swami Jagadananda. Chennai: Sri Ramakrishna Math, 2004, p. 385.
- Sarkar, Dr Jaladikumar. *Dr Mahendralal Sarkar His Life and Thoughts*. Trans. M. Sivaramkrishna. Kolkata: Advaita Ashrama, 2007, p. 56.
- Schrodinger, Erwin. *What Is Life? With Mind and Matter and Autobiographical Sketches*. UK: Cambridge University Press, 1992.
- Séralini, Gilles-Éric and Jérôme Douzelet. *The Monsanto Papers: Corruption of Science and Grievous Harm to Public Health*. Simon and Schuster, 2021.
- Sharma, Kavita A. and Indu Ramchandani. *Life Is as Is: Teachings from the Mahabharata*. New Delhi, India: Wisdom Tree, 2018.
- Skinner, B.F. *Verbal Behavior*. Kindle edition. Barakaldo Books.
- Skloot, Rebecca. *The Immortal Life of Henrietta Lacks*. London, UK: Picador, 2011.
- Tandan, Madhu. *The Logic of Dreams*. New Delhi: Speaking Tiger, 2022.
- Vachani, S. and J. Usmani, eds. *Adaptation to Climate Change in Asia*. Cheltenham, UK: Edward Elgar Publishing, 2014.
- Valiathan, M.S. *The Legacy of Caraka*. Hyderabad, India: Orient Blackswan, 2003.
- Vivekananda, Swami. *The Complete Works*. 25th impression. Volumes 1-9. Kolkata, India: Advaita Ashrama, 2005.
- Warmington, Eric H. and W.H.D. Rouse, trs & eds. *Great Dialogues of Plato*. New York, USA: Signet Classics, Reprint 2015.

Bibliography

Watson, John B. *Behaviorism*. Kindle edition. New York: Routledge, 2017.

Scientific Papers, Reports, and Relevant Websites

American Museum of Natural History. "Georges Lemaître, Father of the Big Bang." <https://www.amnh.org/learn-teach/curriculum-collections/cosmic-horizons-book/georges-lemaître-big-bang>

American Museum of Natural History. "Cosmic Microwave Background Discovered 50 Years Ago Today." 2014. <https://www.amnh.org/explore/news-blogs/news-posts/cosmic-microwave-background-discovered-50-years-ago-today>

American Museum of Natural History. "How Has the Earth Evolved?" <https://www.amnh.org/exhibitions/permanent/planet-earth/how-has-the-earth-evolved>

Archaeological Survey of India (ASI). "Dwarka." Ministry of Culture, Government of India. <https://asi.nic.in/pages/Underwater-archaeology/HQ>

Carney Institute for Brain Science. "BrainGate Research Program." Brown University. <https://www.brown.edu/carney/research-project/braingate>

CBC Radio. "Stephen Hawking's Final Theory Could Prove the Existence of the Multiverse." *As It Happens* with Carol Off. 20 March 2018.

CERN. "A Short History of the Web." <https://home.cern/science/computing/birth-web/short-history-web>

CERN. "Untangling the Origin of String Theory." <https://home.cern/news/news/physics/untangling-origin-string-theory>

Chakravarti, Ankita. "Robot Commits Suicide in South Korea Because It Was Made to Do a Lot of Work." *India Today*, 5 July 2024. <https://www.indiatoday.in/technology/news/story/robot-commits-suicide-in-south-korea-because-he-was-made-to-do-a-lot-of-work-2562775-2024-07-05>

Clynes, Manfred E. and Nathan S. Kline. "Cyborgs and Space." *Astronautics*, September 1960. <https://web.mit.edu/digitalapollo/Documents/Chapter1/cyborgs.pdf>

Bibliography

- Danino, Michael. "The Aryan Invasion: Myth or Fact." Archaeological Sciences Centre, IIT Gandhinagar. https://asc.iitgn.ac.in/assets/publications/popular_articles/The_Aryan_Invasion_Myth_or_Fact-Michel-Danino.pdf
- Elhacham, E., et al. "Global Human-made Mass Exceeds All Living Biomass." *Nature* 588, 442–444 (2020). <https://doi.org/10.1038/s41586-020-3010-5>
- European Environment Agency. *Late Lessons from Early Warnings: Science, Precaution, Innovation*. Summary EEA Report No 1/2013. <https://www.eea.europa.eu/publications/late-lessons-2>
- European Space Agency. "Cosmic Microwave Background (CMB) Radiation." Science & Exploration. https://www.esa.int/Science_Exploration/Space_Science/Herschel/Cosmic_Microwave_Background_CMB_radiation
- European Space Agency. 2024. https://www.esa.int/ESA_Multimedia/Images/2024/03/Gaia
- Goodreads. "Carl Sagan." Quotable Quotes. <https://www.goodreads.com/quotes/601581-the-hindu-religion-is-the-only-one-of-the-world-s>
- Harvard Kenneth C. Griffin Graduate School of Arts and Science. "Human-made Materials Outweigh All Living Beings on Earth." Science in the News, Blog, 23 December 2020. <https://sitn.hms.harvard.edu/flash/2020/human-made-materials-outweigh-all-living-beings-on-earth/#>
- Indian University Bloomington. "Artificial Cells Demonstrate that "Life Finds a Way." Department of Biology, 5 July 2023. <https://biology.indiana.edu/news-events/news/2023/lennon-minimal-cells.html>.
- Institute of Human Origins. "Lucy's Story." Arizona State University. <https://iho.asu.edu/about/lucys-story>
- Internet Encyclopedia of Philosophy. "Charles Darwin." <https://iep.utm.edu/darwin/>
- Josephson, Brian. "The Challenge of Consciousness Research." 1992. https://www.academia.edu/67202522/The_challenge_of_consciousness_research?uc-sb-sw=10424024

Bibliography

- J. Craig Venter Institute. "First Self-Replicating Synthetic Bacterial Cell." <https://www.jcvi.org/research/first-self-replicating-synthetic-bacterial-cell>
- Khan Academy. "Hypotheses of the Origin of Life." <https://www.khanacademy.org/science/ap-biology/natural-selection/origins-of-life-on-earth/a/hypotheses-about-the-origins-of-life>
- Kim, M.J., et al. "Birth of Clones of the World's First Cloned Dog." *Scientific Reports* 7, 15235 (2017). <https://doi.org/10.1038/s41598-017-15328-2>
- Lane, N. "The Unseen World: Reflections on Leeuwenhoek (1677) 'Concerning Little Animals'." *Philosophical Transactions of the Royal Society B: Biological Sciences* 370, 1666 (2015). <https://doi.org/10.1098/rstb.2014.0344>
- Lozovska, A., et al. "Tgfb1 Controls Developmental Plasticity between the Hindlimb and External Genitalia by Re-modeling Their Regulatory Landscape." *Nature Communications* 15, 2509 (2024). <https://doi.org/10.1038/s41467-024-46870-z>
- Michaelsen, M. M., et al. "Mindfulness-based and Mindfulness-informed Interventions at the Workplace: A Systematic Review and Meta-Regression Analysis of RCTs." *Mindfulness*, 1–34. <https://doi.org/10.1007/s12671-023-02130-7>
- Moger-Reischer, R.Z., et al. "Evolution of a Minimal Cell." *Nature* 620, 122–127 (2023). <https://doi.org/10.1038/s41586-023-06288-x>
- Nagel, Thomas. "What Is It Like to Be a Bat?" *The Philosophical Review* 83, 4 (October 1974), pp. 435–450.
- NANOGrav. "An International Collaboration Dedicated to Exploring the Low-frequency Gravitational Wave Universe through Radio Pulsar Timing." 21 June 2024. <https://nanograv.org/>
- NASA. "Big Bang Cosmology." Universe 101. https://map.gsfc.nasa.gov/universe/bb_theory.html
- NASA. "Edwin Hubble." <https://science.nasa.gov/people/edwin-hubble/>
- NASA. "Large Scale Structures." <https://science.nasa.gov/universe/galaxies/large-scale-structures/>

Bibliography

- NASA. "Origin of Everything: Hot Bang or Ageless Universe?" <https://imagine.gsfc.nasa.gov/educators/programs/cosmictimes/educators/guide/1955/origin.html>
- NASA. "Superstrings." <https://imagine.gsfc.nasa.gov/science/questions/superstring.html>
- NASA. "Webb, Hubble Combine to Create Most Colorful View of Universe." <https://www.nasa.gov/missions/webb/nasas-webb-hubble-combine-to-create-most-colorful-view-of-universe/#>
- National Geographic. "HMS *Beagle*: Darwin's Trip around the World." <https://education.nationalgeographic.org/resource/hms-beagle-darwins-trip-around-world/>
- National Human Genome Research Institute. "The Human Genome Project." <https://www.genome.gov/human-genome-project>
- National Institute of Health. "The Human Microbiome Project." <https://commonfund.nih.gov/hmp>.
- National Institute of Oceanography. "Dwarka." <https://www.nio.res.in/galleries/show/dwarka>
- Neuralink Corporation. "Brain-Computer Interface (BCI): Prime Study Progress Update." <https://neuralink.com/blog/prime-study-progress-update/>
- North Arizona University. "Islam Creation Story." <https://www2.nau.edu/~gaud/bio301/content/iscrst.htm>
- PBS. "Jean Baptiste Lamarck." Evolution. https://www.pbs.org/wgbh/evolution/library/02/3/1_023_01.html
- Perrigo, Billy. "Why Timnit Gebru Isn't Waiting for Big Tech to Fix AI's Problems." *Time*, 18 January 2022. <https://time.com/6132399/timnit-gebru-ai-google/>
- Physics World. "String-theory Calculations Describe 'Birth of the Universe'." 6 December 2011. <https://physicsworld.com/a/string-theory-calculations-describe-birth-of-the-universe/>
- Plato. "Allegory of the Cave." Trans. by Shawn Eyer. https://scholar.harvard.edu/files/seyer/files/plato_republic_514b-518d_allegory-of-the-cave.pdf

Bibliography

- Rincon, Paul. "Stephen Hawking's Warnings: What He Predicted for the Future." BBC, 15 March 2018. <https://bbc.com/news/science-environment-43408961>
- Roslin Institute of Scotland. "Dolly the Sheep." The University of Edinburgh. <https://www.ed.ac.uk/roslin/about/dolly>
- Science Daily. "Einstein's Conversion from a Belief in a Static to an Expanding Universe." Science News, 17 February 2014. <https://www.sciencedaily.com/releases/2014/02/140217102545.htm>
- Stanford Institute for Theoretical Physics. "Cosmology." Stanford University, School of Humanities and Sciences. <https://sitp.stanford.edu/research/cosmology>.
- Stanford Encyclopedia of Philosophy. "Identity." <https://plato.stanford.edu/entries/identity/>
- Stanford Encyclopedia of Philosophy. "Kant's Moral Philosophy." <https://plato.stanford.edu/entries/kant-moral/>
- The International Genome Sample Resource. "The 1000 Genome Project." <https://www.internationalgenome.org/>
- The Nobel Prize. "The Nobel Prize in Physics 1903: Henry Becquerel" <https://www.nobelprize.org/prizes/physics/1903/becquerel/facts/>
- The University of Arizona. "Orch OR." Center for Consciousness Studies. <https://consciousness.arizona.edu/orch-or>
- United Nations. "The 17 Goals." Department of Economic and Social Affairs. <https://sdgs.un.org/goals>.
- Yong, Ed. "Out-of-body Experience: Master of Illusion." *Nature* 480, 168–170 (7 December 2011). <https://doi.org/10.1038/480168a>

Acknowledgements

The idea of this book emerged almost two decades ago. Since then, this was a topic of conversations with many. Over the years new concepts emerged, genome research advanced, and understanding of omics and epigenetics became more evident. Several colleagues, students, teachers, and friends offered valuable critique and suggestions for further improvements in the approach and content. It is very difficult to name everyone who helped us in this process. However, we wish to mention a few who made substantial contributions for this book.

In the initial phases, Alex Hankey and I (Bhushan) closely worked on this concept. We discussed this idea with Professor Brian Josephson at University of Cambridge. During this period, Girish Tillu, Kalpana Joshi, and colleagues from the CSIR NMITLI team and AyuGenomics project helped enrich the Om and genome interlinking. Later, the idea and structure of the book started taking shape during engaging discussions with Avinash Patwardhan, Gururaj Mutalik, Ashok and Rama Vaidya, Darshan Shankar, Sharad and Medha Deshpande.

By now Indu Ramchandani had come in and both of us took the book forward. After we drafted a brief about the book and prospective table of contents, we bounced this concept off a wider and diverse group of experts to receive comments and critique. The Brainstorming Meeting organized at the Interdisciplinary School of Health Sciences was very useful in revising the initial structure. This was attended by over 15 curious individuals representing different generations and disciplines. We requested participants to share their comments. Akash Saggam, Sanchita Sangle, Kalindi Kale, Rahul Shidhaye, Sarika Chaturvedi, Anagha Lavalekar, Eha Kulkarni, Chandan Chatterjee, Sham Diwanay, and Vishnu Joglekar offered valuable comments and support.

Acknowledgements

We then shared a revised concept note, table of content, and a sample chapter with a few experts to receive broad comments. In this phase, Julia Arnold, Santhosshi Narayanan, Renee Mehrra, Indu Kering, Sujata Kelkar, Ajit Kulkarni, Sanjay Nagarkar, Mukund Chorghade, Anil Deshpande, and K.P. Mohanan offered valuable comments. Based on this exercise, we created the first draft of the full book. Again, we invited diverse experts to review the draft manuscript. In these semi-final and final rounds, the following experts offered valuable comments and constructive critique: G. Jagadeesh, Mahadevan Seetharaman, Ravi Ghooi, Anuradha Shah, Raju Kelkar, R.L. Deopurkar, Supriya Kulkarni, Sumeet Goyal, Rathnam Chaguturu, Sachin Chaturvedi, Madhav Deo, and Pravrajika Divyanandaprana. This final book in its present form was possible only because of valuable inputs received formally and informally from countless friends and well-wishers. In addition to names mentioned here, several others have helped us in this endeavour. We remain grateful to all of them.

We especially thank Gururaj Mutalik and R.A. Mashelkar for continuous mentorship and for writing inspiring forewords. We are grateful to K. Kasturirangan, Gerard Bodeker, Vikas Sukhatme, Julia Arnold, B.M. Hegde, Georg Seifert, H.R. Nagendra, Rajesh Kotecha, Madhuri Kanitkar, Suresh Garimella, Santishree Pandit, Carani.B. Sanjeevi, Ikhlas Khan, Ravindra Ghooi, Roy Upton, Anil Sahasrabuddhe, Vishvanath Karad, Anil Kakodkar, David Frawley, Amarjeet Bhamra, Madan Thangavelu, Rajiv Kumar, Shekhar Mande, Suresh Prabhu, and Vijay Bhatkar, who have graciously written endorsements for the book.

We thank all scientists who have extended kind permissions to cite their work and reproduce some interesting images. We acknowledge key resources such as Wikipedia and Encyclopaedia Britannica and search engines such as Google and Bing. We have sparingly used large language models mainly for consolidating data.

We thank Shalaka and the team of Urmi Designs, Gautam and the team of MyAmCorp, and Advisory Pvt. Ltd for all the graphics and artwork. Last but not the least, we would like to thank our respective families who very silently supported our efforts and

Acknowledgements

endured the months, days, and all odd hours when we remained lost behind the computer screens with total disregard to their share of our time!

We thank the publisher, BluOne Ink, for bringing out this work in a quick time frame keeping in mind the evolving dynamics of the subjects covered.