



Coach

01

### On the way to the Big Bang

Why are the laws of nature the way they are? Are all the forces descended from one elemental force? Why did the world not disperse as light during the Big Bang, instead of forming stable matter? How did the universe expand to its current size? What holds the world together? What determines its speed? What factors define the universal constants that determine our universe?



Coach

02

### Nanocosmos

The Nanocosmos is providing the physical, chemical and material science-related foundations for better, more compact and less-expensive future products. Technical applications are born from the micro-milling machine and ideal catalytic converter. How can we specifically influence the properties of materials? Can we build computers that work with light? Which laws govern the quantum world?



Coach

03

### Building Blocks of Life

The cells are the building blocks of life and they develop into tissues and organs in our body. How are the form and function of life's building blocks connected? How can we technically put nature's structural principles to use? Which cellular defects lead to disease? The macromolecules are important in cellular functions of our body and are carriers of information. The processes in living cells can be understood through the interaction of macromolecules.



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04

### From Gene to Organism

Which programs control the development of life? How did the diversity of life's forms arise? How does the cell use the information encoded in the genome to fulfill its function? How DNA controls the gene expression? How do genes interact in networks, and what influence do external factors exert? How can the natural control system be used for new therapy forms? Can we reprogram body cells? Why do we age?



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05

### Architecture of the Mind

How does the brain function? How the interaction of the neurons controls each of the body's functions, allows thoughts, perceptions, memories, feelings, and also movement and communication through transmitting signals? The cause of many neurological diseases lies in defects in genes that play a role in development. How most of the genetic diseases affect the nervous system? Can we repair our brain?



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06

### The World of Senses

When we smell, speak, hear, feel, think, make plans, move or learn, extremely complex processes-'neurons and their interaction' are at work in our brain. How does the brain use the different information to produce an image of the world and the insights into brain? What is consciousness? What individual differences determine our self?



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07

### Technologies of the Future

Sensors help to understanding what holds the world together and how processes occur in space or in living cells. They are of molecular proportions, can be made of polymers, coated ionic conductors or proteins, are accurate and function on the basis of atomic and quantum phenomena. Only 'Mathematical methods', the basis for the measured data, help in understanding the organizational principles of nature and complex networks, like irregularities during heart attacks and mobile networks. How to cope with the increasing volumes of data and complexities of science? How to use computers to recognize patterns effectively?



Coach

08

### From Data to Knowledge

Scientists use models as the foundation for simulations, to imitate specific changes in individual parameters. Visual images help to make the results more comprehensible. The behaviour of atoms and molecules can be described on the computer and their basic chemical reactions calculated. Scale adjustment and integrating quantum mechanics in computer models help in calculating the 'macroscopic properties of solids'. Biologists, physicists, statisticians, computer scientists and astrophysicists work together and analyze astronomical data and conduct acceleration experiments. Are there limits to our perception of the world?



Coach

09

### Global Challenges

Feeding people, keeping them healthy and providing them with energy are true global challenges. Research focuses on finding the molecular causes of diseases and developing targeted therapies and tailored medicines. The new ideas for generating energy have started research in nuclear fusion of  $H_2$  into He, development of new technologies for generating, transporting and storing  $H_2$ , Plasma, artificial photosynthesis, as well as the development of innovative materials for robust and powerful fuel and solar cells. Can ageing be delayed and can we secure sustained development?





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## Spaceship Earth

Life on earth is only possible because of the complex coexistence among land ecosystems, oceans, atmosphere and the substances that circulate among them. How can we preserve earth's protective systems? Micro-organisms help in sustenance of the biosphere and the earth as a whole. They control the circulation of life's most important raw materials C, N<sub>2</sub>, O<sub>2</sub>, P, S, Fe, Mn and H<sub>2</sub>O and have effective role in communication within the body. How can we better predict natural disasters and ensure the balance of eco-systems?



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## Our Home in the Cosmos

How the sun works: what does its magnetic activities look like? How are the highly-charged particles heated and dispersed in powerful pulses? Which energy transformations result in the heating of the sun's corona and emission of the solar wind? How and what is the influence of sun on the Earth? How has the formation and development of stars and planets taken shape to its present state? The researchers are trying to trace life on other planets.



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## The Universe

The origin of universe-how and when did the universe take shape and its evolution to present state? Scientists and researchers are trying to understand the cosmic processes and what happens behind the horizon of black holes and galaxies and features on Milky Way. How "dark matter" and "dark energy" is dispersed throughout the universe?



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## Department of Science & Technology

Divided into sections; it shows the glorious legacy of India, India Today and Tomorrow in Science & Technology. Other major attractions are India's achievements in IT, Biotech, Space and Nanotechnology, besides film shows on topical issues.



## BASF Kids' Lab

(World of Chemistry)

The hands-on experiments in the BASF Kids' Lab introduce young minds to the fascinating world of chemistry. BASF also shows how chemicals touch our lives daily from sunrise to moonrise and the career paths in chemistry through a series of short films, displays and hands-on simple experiments.



## Partners



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