

'Science Express' is a unique science exhibition on a 16-coach, fully air conditioned train traveling across the country. It showcases cutting edge research in different fields of Science. This Indo-German collaborative project is a modified version of the inaugural exhibition train that was flagged off on 30 October 2007 by Honorable Prime Minister of India Dr. Manmohan Singh and German Chancellor Dr. Angela Merkel. This innovative exhibition, which created four National Records, received unprecedented response at all the halts in the first two phases. Till date over 50 lakh people, majority of them students, have visited the Science Express. Now in its third phase, it has so far traveled to 150 cities across India where it halted during its three phases spread over 550 days, covering more than 45,000 km across India.

The state-of-the-art mobile science exhibition on the train attempts to develop scientific temper among the masses and encourages students to pursue careers in science. It hosts interactive exhibits developed by Max Planck Society, Germany, Department of Science & Technology (DST), Govt. of India and Vikram A Sarabhai Community Science Centre (VASCSC), Ahmedabad in 11 coaches. It also hosts an exhibition on Climate Change sponsored by HSBC in one coach. In another coach, Joy-of-Science hands-on lab of VASCSC has been put up for conducting over 60 interesting experiments & activities in Science & Mathematics along with an exhibition on India's heritage in Science & Technology. VASCSC has partnered with DST, for its management throughout the country. The Science Communicators aboard the train interpret the exhibits, solve queries of visitors and facilitate them.

More information on www.sciencexpress.in



Science Express exhibition coaches present cutting-edge research through audiovisuals, video clips, multimedia and interactive exhibits...



Coach 01 ON THE WAY TO THE BIG BANG

This coach is a representation of the universe according to inflationary cosmology. Here the smallest particle of matter and its energy, elementary particles, the fundamental forces, Higgs field, matter and antimatter are discussed thoroughly. More stress is upon the world's largest accelerator- Large Hadron Collider designed by CERN in Geneva which would unravel the mysteries of the universe. The coach has information on:

- ATLAS Detector • XFEL X-ray LASER • Filming a molecule
- Time microscope • Super cold atoms & ultra short light pulses



Coach 02 NANOCOSMOS

Nanotechnology is the technique of molecular manufacturing. The basic theme of the coach is how can we systematically influence the materials? Nano technology is the applied science which provides the physical and chemical foundations for better, more compact and less expensive future products. Nano cosmos is the point where the smallest man-made devices meet the atoms and molecules of the natural world. The coach has information on:

- Synchrotron • Optoelectronics • Milling machine
- Scanning Tunneling Microscope



Coach 03 BUILDING BLOCKS OF LIFE

This coach reveals the facts of life. The definition of life could be better understood in this section of the exhibition. Cells are the basic unit of life. They have different kinds of interactions within the body. These are all some molecular interactions. The structures of living organisms, whether macroscopic or microscopic, are very complicated. The exhibits of this coach clarify the molecular foundations of the various biological processes to develop new and efficient methods for study of such interactions and structures. The coach has information on:

- Artificial vesicle • Quantum Dots • Molecular motors
- Protein-protein interaction



Coach 04 FROM GENE TO ORGANISM

This coach reveals how gene interaction leads to the formation of an individual. The information of life is encoded in the genetic material i.e. DNA or RNA. How these genes and the genetic interaction are responsible for processes in the lifetime of an organism such as growth, development, aging, disease, etc. are well illustrated in the coach. New therapy such as Stem cell therapy is discussed in detail. The coach has information on:

- Genomics • Human genome project • Living Antibiotic
- Plants in Cancer research



Coach 05 ARCHITECTURE OF THE MIND

There are many things which still remain at the centre of interest of research workers like; How do we understand? What is memory? How to increase the memory? Why do we forget? What are the factors involved when messages are released. How the signals are released and how are they coordinated? How signal molecules activate the circuits present in a cell? These questions lay the foundations of neuroscience and the basic discussion in this coach is about the structure and function of the brain and nervous system. The coach has information on:

- Signal transmission • Multiple sclerosis • Parkinson's disease
- Complex communication • Neurological disorders



Coach 06 THE WORLD OF SENSES

We human beings are the unique creation of nature, having variety of skills like ability to speak, communicate with complex languages, well defined cultural as well cognitive skill. But where do we evolve to get these skills? How do we perceive things? How do we recognize different faces? Which part of our brain is active while we smell or listen to music? How the various activities and disorder of neurons are detected with the help of modern medical technology? Some of these aspects are discussed in the coach. The coach has information on:

- Human evolution • Speech gene • Window to the brain
- Tansen query by humming



Coach 07 TECHNOLOGIES OF THE FUTURE

Because we find complexity everywhere, the answer of the question can explore many other questions in our mind about complexity. Technologies are being used to measure the complexity in various ways. But are these technologies enough to provide us the solutions to our questions? How can we increase the potential of our technology? Research is being carried out to bring about future technology. This coach throws light on our advanced technology and what & how of it! The coach has information on:

- Supercomputer and teraflops • Quantum geometry
- Dielectric resonator • Sensors



Coach 08 CLIMATE CHANGE

Climate Change is the major, overriding environmental issue of our time and the single greatest challenge facing the modern civilization. It is a growing crisis with economic, health, safety, food production, security and other dimensions. The coach depicts how climate is changing, how mankind is contributing to this problem and how adaptation and mitigation of this global issue with people's initiative is possible. The exhibition, sponsored by HSBC, has information on:

- Global warming • How a tree gains weight
- Adaptation & Mitigation • Carbon foot print • Carbon hand print



Coach 09 GLOBAL CHALLENGES

The world is in search of optimum solutions for all the global challenges. To feed the global population of 6 billion, give them healthy environment and to provide them with energy are the real global challenges. The coach depicts the shift of conventional energy to non conventional energy resources, innovation in medical technology to mitigate global health problems and extensive use of biotechnology in the field of agriculture to meet the food requirement for people across the globe to sustain the development. The coach has information on:

- Fusion Energy • Fuel cell • Epidemics
- Recombinant DNA technology • Plant protection



SPACESHIP EARTH

Life is only possible on Earth because of the co-existence of various systems and their relationship among themselves. How is the energy flow maintained among the living beings through food chain to balance the nature? Earth has its own activity and its own protective layer. How does the Earth's protective layer get destroyed? What happens when Earth loses its resilient capacity? Why do natural calamities occur? What is the magnetosphere? The comprehensive study of the natural system has been put up in this coach. The coach has information on:

- Bacterial reef • Genetic diversity • Sulfur pearl
- Adaptation • Particle Imaging Detectors • Aerosol



OUR HOME IN THE COSMOS

Is life possible on any other planet in the solar system? Sun is the parent star of Solar system. How are highly charged particles heated and dispersed in powerful pulses? Which energy transformation results in the heating of sun's corona and emission of solar wind? What are the influences of Sun on Earth? Studying the Sun, however, also entails gaining knowledge about the planets, their atmosphere, moons and the formation and development of these bodies. This coach is answering these curious questions of mankind. The coach has information on:

- Orion Nebula • ALMA Radio telescope
- Weight on other planets • Solar flares • Sunspot



THE UNIVERSE

Beauty and the mystery of the universe fascinated the mankind. Let us explore the universe. How did the Universe originate and evolve? How did it come to have the order and structure we know today? How old is our Universe? To find answers to these questions, study of the cosmic process like the birth and death of stars, dark matter and dark energy and the creation of galaxies and black holes are discussed in the coach. The coach has information on:

- Supernova • Apex telescope • Gravitational lens
- Neutron star fusion • Milky Way



SCIENCE AND TECHNOLOGY IN INDIA

The coach number 13 is dedicated to science & technology development in India. The coach focuses on inventions and discoveries in India as well as Indian contribution to Science. India is now one of the most powerful knowledge hubs. Today India has all kinds of infrastructural assets in Science and Technology. This coach outlines the contribution of India in the field of Science and Technology, from the invention of "zero" to launch of Chandrayaan -1.

THE JOY OF SCIENCE

Joy of Science is fascinating part of this coach. "Joy of Science Hands-on Lab" is set up and managed by VASCSC. Children can perform practical experiments and hands-on activities in Physics, Chemistry, Biology, Electronics and Mathematics in this mobile lab. Over 50 exciting experiments and activities based on high school curriculum, facilitated by Science Communicators, are performed here.



Science Express, after two successful phases, is now on its third tour across India to nurture curiosity in our youth and rejuvenate scientific temper amongst people.



For more details, please contact:

Vikram A Sarabhai Community Science Centre, Navrangpura, Ahmedabad - 380 009, India
T: +91 79 26302914, 65242006 E: scienceexpress@gmail.com W: www.scienceexpress.in

www.scienceexpress.in

A unique
Science Exhibition
running on
Indian Rail tracks



The current phase

- 02 Oct 09 - 27 April 10
- 56 cities
- 208 days
- 18,000 kms
- 16 Coach AC Train

Science Express
QUESTION • EXPLORE • DISCOVER