2005 Einstein Exhibition

Association for Advancement of Scientific Culture

“2005 Einstein Exhibition“

※ Time : **July 1, 2005 ~ Feb. 28, 2006**

※ Venue : **Seoul Science Museum (Next to Chang Gyung Palace)**

※ Description :

Young Albert Einstein at age of 26 had published 4 papers, each one of them could made the reputation even a career for a young man.

The exhibition is designed to explore his works of 1905, i.e. special relativity, Brownian motion, photoelectric effect, $E=mc^2$ and his other major achievement.

The exhibition is divided in four parts;

1. **Einstein and his life**
2. **Einstein and arts**
3. **Einstein’s science**
4. **Edutainment**

The scientific parts, 3) are again divided in three different categories. The first part introduce scientific understanding by experience, the second parts shows it's application and the third part consists of everyday Einstein.

The followings are a brief examples of each parts.

1. Einstein and his life

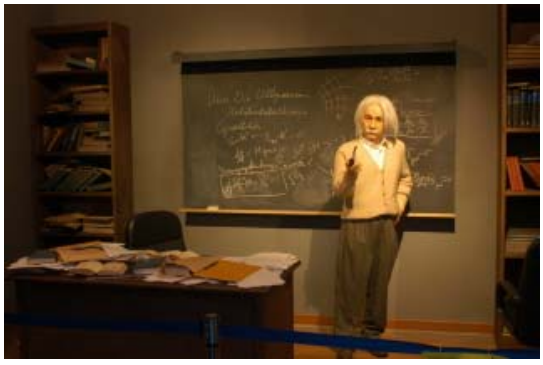
His various photos from childhood to later years will be displayed in LCD panels. High light of this section is a replica of his study. Going through time tunnel, you meet Einstein of 1940's. Kids can sit in his study for few minutes and enjoy being an Einstein.

We also exhibit part of his brain.

■ Entrance

■ Time tunnel

■ Vice Premier Oh,
minister of MOST going through
Time tunnel



■ Einstein's study room

■ Einstein's hand written draft of relativity paper

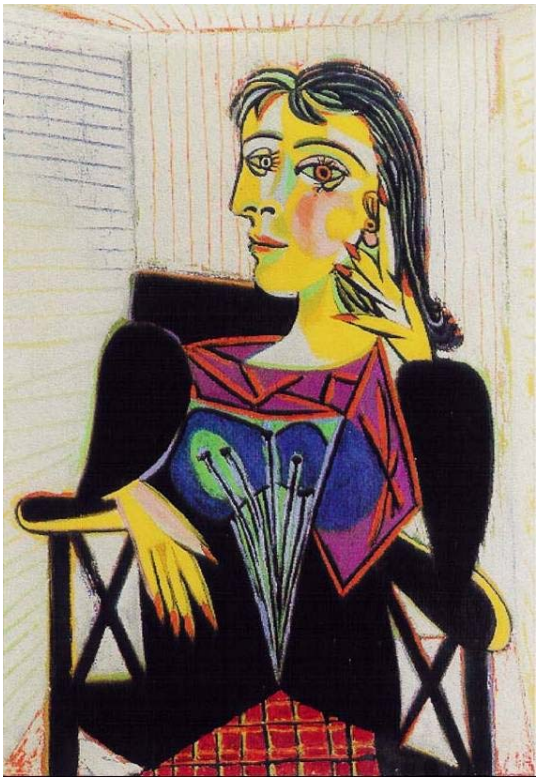
■ Letter to President Roosevelt

■ Einstein's brain piece

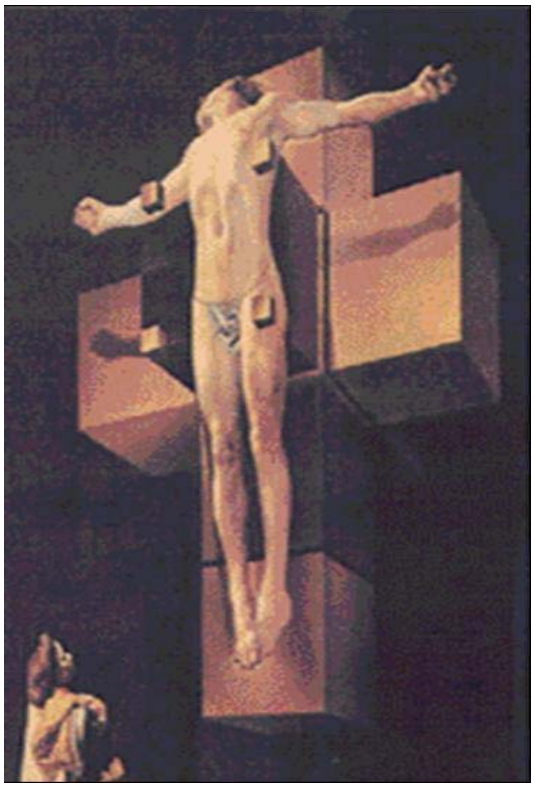
2. Einstein and arts

The influence of four dimension is evident in the works of Picasso and Dali. As Dali's "Christ in hypercube" represent christ in three dimensional projection of 4 cube which can be interpreted as hyper cross.

In the exhibition hall, video tape shall explain development of space-time by prospect from both Science and Arts.



■ Portrait of Mara



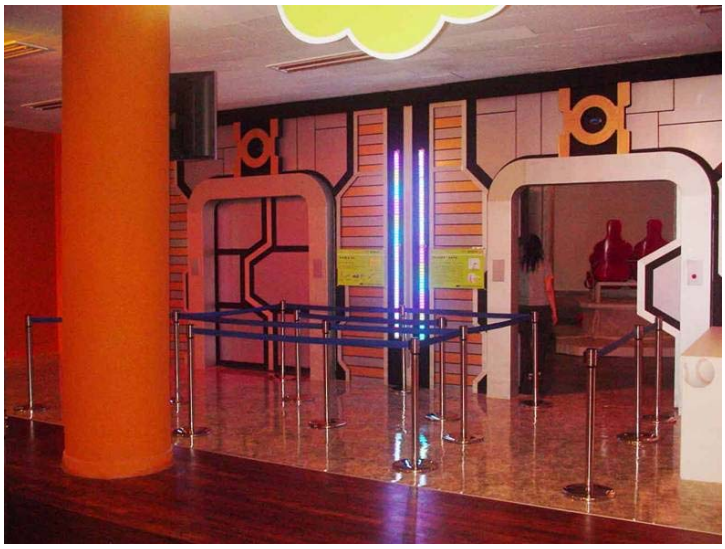
■ Christ in hypercube

3. Einstein's science

(1) Space-time

The effects of special relativity will be exhibited. A typical one would be time delay (Lorentz Contraction).

Kids steps into spaceship like device as shown below. By vibration of floor and approaching seen from front, kids feels as if he is speeding. He or she then look at the side windows of his spaceship. One then finds worm holes etc. as he travel through outer space.

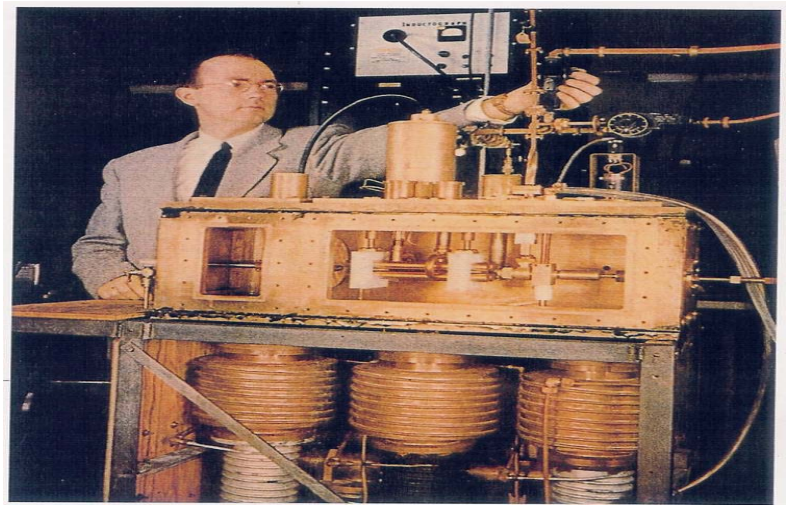


■ Entrance of Space travel hall

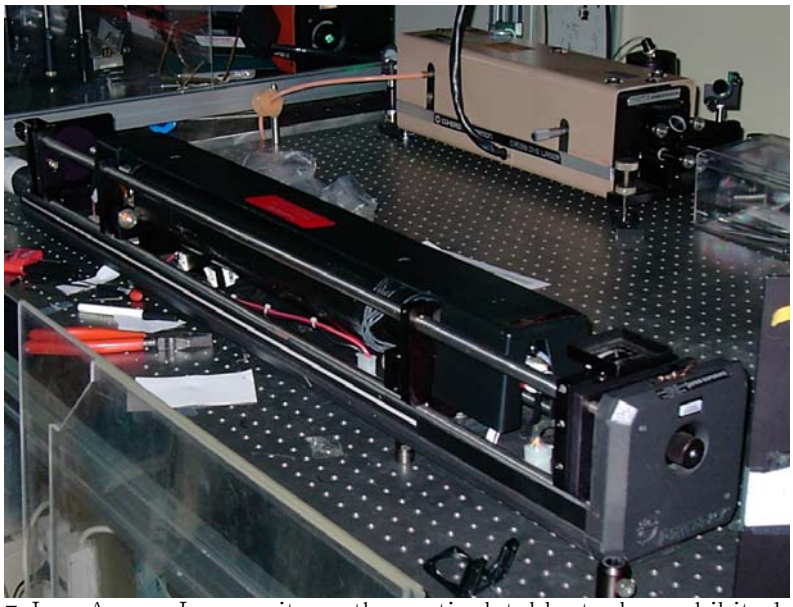
■ Inside of Space travel hall

(2) Light, Wave and Matter

Einstein is the first one to propose the existence of stimulated emission of light. We use an Ion-Argon laser of 8watts to show how laser works. The cover of Ion-Argon laser will be removed to show inner parts of laser. Kids can adjust the mirrors by stepping motor. When it aligns perfectly laser light will comes out and float the smiling Einstein in the fog.



■ Professor Towns adjusting his MASEAR.

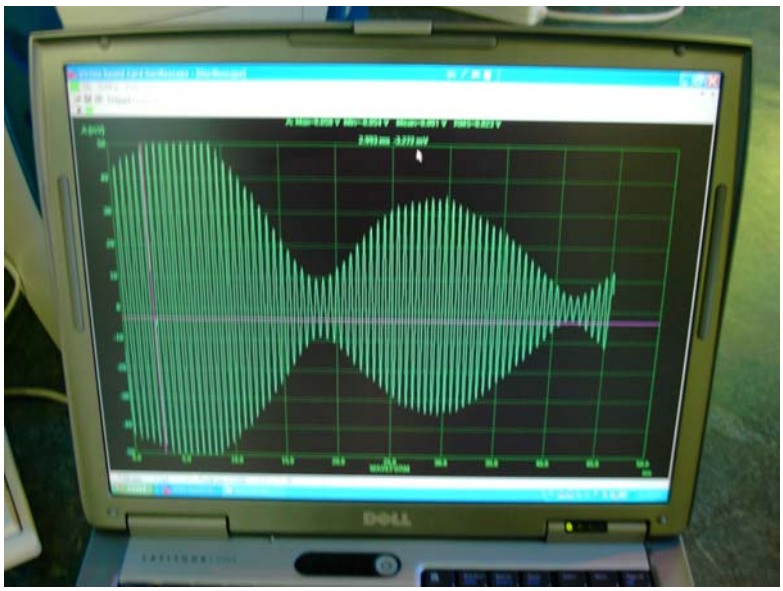


■ Ion-Argon Laser sit on the optical table to be exhibited. (supervised by Prof. K. H. Ahn of S. N. U.)

(3) Einstein's Universe

According to Einstein, space-time is wrapped by matter. Just like moving charge radiate the electromagnetic wave, a heavy object accelerating must emit the gravitational wave. We install a replica of Weber detector, first gravitational detector in the world built by Dr. Weber.

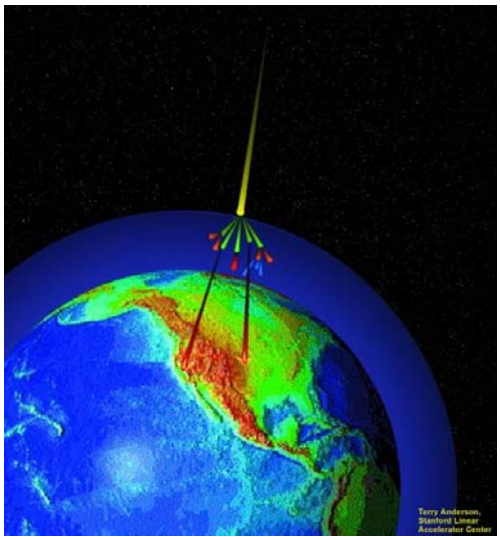
■ A replica of Weber detector from University of Maryland. (supervised by Prof. H. J. Paik)



■ Signal output from detector.

(4) Spark Chamber ; Time Dilation

The intensive cosmic ray, high energy particles coming from outer space, bombard upper atmosphere of earth constantly. It makes the shower of secondary particles.



■ A cosmic ray (yellow) hits the upper atmosphere and produces a shower of other particles (green). Some of these, red one called muon, comes down to earth.

■ The muon going through spark chamber leaves the trace of spark.

One kind of them, called Muon which is heavy brother of electron, is produced abundantly there. The Muon lives only 2.2 microsecond and hence can travel 660 meters even if it travels with the velocity of light. Therefore it can not reach the surface of earth because the upper atmosphere where it is produced is more than 50 kilometers above if no time dilation by relativistic effect. Because of relativistic time delay of more than hundred fold relative to stationary time on earth, the muon can reach the surface of earth.

The spark chamber detect these muon by showing the spark along it's track as shown in figure.

4. Edutainment

Audience can enjoy while they learn physics by touching and playing.

We will just show few examples.

(1) Planetary motion and the bending of light

A curved surface around the Sun is set up as shown in the figure below. The kids can roll the metal ball. If it released with a big speed it will bent just a little bit like light ray would. However, if you roll the ball near the fake Sun with very slow speed it will be momentary traped and move on an elliptic orbit like Planets do. You can also check that it will make a parabola with an adequate speed like a comet does.

■ Curved space

(2) Magic and show

To attract the interest of audience. We will have magic including black hole and also solicit the question. In the variety show some of the idea of Einstein's work will be incoporated.