REPORT ON THE ASIAN SCIENCE CAMP 2016

PREPARED BY:

NURLIYANA

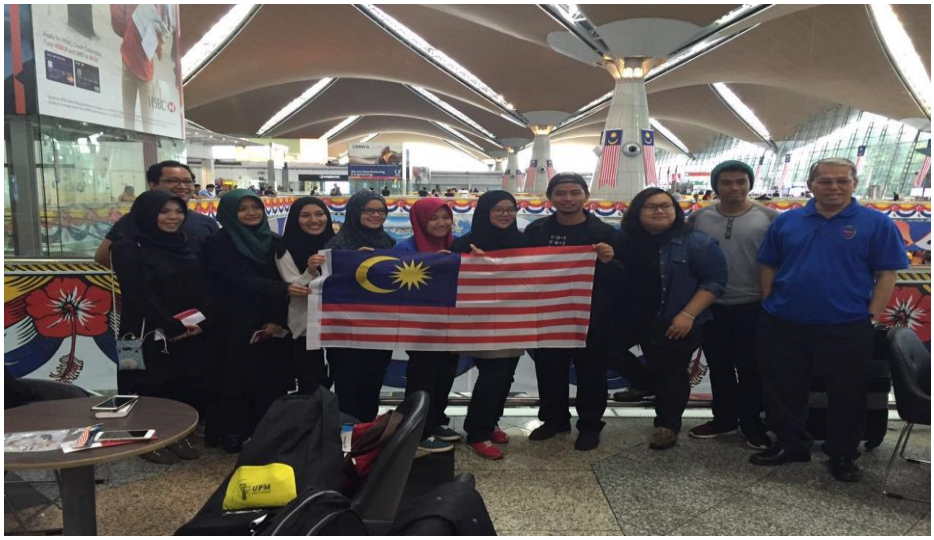
MOHD AMIN

B. SC. (BIOLOGY)

UNIVERSITI PUTRA MALAYSIA

INTRODUCTION

The 10th Asian Science Camp was held on the 21st August (Sunday) until the 27th August (Saturday) 2016 in Bangalore, India. This camp was attended by 6 Nobel Laureates and world-distinguished scientist as well as 240 students from different countries. 9 of the participants from Malaysia attended this camp.



The Malaysian delegation and leaders (From left: Syara, Dr Yusrizam Sharifuddin, Nurliyana, Maheran, Nazihah, Evi, Diyan, Amir, Ili, Annur and Dr Mohd Jamil)

ABOUT INDIAN INSTITUTE OF SCIENCE (IIsc)

The Indian Institute of Science was founded in 1909 as a result of the joint efforts Jamsetji Nusserwanji Tata, the Government of India, and the Maharaja of Mysore. Over the 105 years since its establishment, IISc has become the premier institute for advanced scientific and technology research and education in India. Most of the activities that are held there include plenaries session, dialogue session, camp session, cultural activities, excursions and poster presentation.

ORIENTATION AND BRIEFING (21ST AUG 2016)

This session is introduced to give a slight briefing on the programs of the entire camp. It is started off with a welcoming speech by Arabinda Mitra. The members of a group were given randomly and they came from 23 different countries. In my group there were from

Nepal, Indonesia, South Korea and Taiwan. After the briefing session ended, a photography session also took placed near the IIsc.

Participant from different countries

PLENARIES

Six plenary lectures were given by the Nobel Laureates and the Distinguished Scientist. Each lectures last 90 minutes, including time for questions and answers.

PLENARY 1- CELEBRATION OF SCIENCE IN THE YEAR OF CHEMICAL BONDING.

The first plenary was given by CNR Rao, an Indian chemist. He started off with some beneficial quotes from himself. He stated that we must pursue our dream with passion, observe leaders closely, learn as much as we can and love science in order to be a successful person as a well-known scientist such as Linus Pauling. He then continued with the history of the discovery of atoms such as Rutherford discovered the atomic structure and J.J Thomson discovered the electrons. He also informed about Linus Pauling, an American chemist. He published the first book on Quantum Mechanics since he is the founder. Artificial photosynthesis- water splitting was also explained thoroughly by CNR Rao. Artificial photosynthesis is commonly used to refer to any scheme for capturing and storing the energy from sunlight in the chemical bonds of a fuel (a solar fuel). Photocatalytic water splitting

converts water into hydrogen ions and oxygen, and is a main research area in artificial photosynthesis.

PLENARY 2- ON PARTICLES, STARS AND ETERNITY.

For the second plenary, Cedric Villani, a mathematician gave a talk about stars, particles and eternity. He started off by declaring that the best job in the world is mathematician and the use of mathematic is vast. Mathematic are used in animation as well as in building construction. Cedric Villani has given fundamental contributions to the understanding of the Boltzmann equation and Landau damping. He stated that the stability of solar system will be triggered and end up crashing after some years. It was a fascinating talks because many mathematic and physic theory were well explained by him.

PLENARY 3- SUPERCONDUCTIVITY- FROM A 20TH CENTURY DISCOVERY TO A 21ST CENTURY TECHNOLOGY.

After the plenary 2 has ended, J. George Bednorz, a German physicist proceeds with the next talk on his discovery of high-temperature superconductivity which leads to the new perspective for the creation of energy-efficient technology. A superconductor is a material that has no resistance of electricity. Unfortunately the novel copper-oxide superconductors brought challenges for technology. As the result of a worldwide science and engineering effort over the past two decades, major obstacles have been removed. The applications of the superconductivity give many benefits to the human kind. Example of the application that is being used today is transport vehicle.

PLENARY 4- DISCOVERY OF NEUTRINO OSCILLATIONS

On the third day of the camp, we were given an opportunity to hear talk from Takaaki Kajita. He discussed his experimental studies that led to the discovery of neutrino oscillations. The discovery of atmospheric neutrino was in the year 1965. It was discovered by detectors located deep underground in South Africa and India. Kamiokande was built in 1983 and it has diameter of 60m and a height of 60m. It was built to calculate atmospheric neutrino. Later, Super Kamiokande was built to test oscillation hypothesis for solar and

atmospheric neutrinos. I, myself am amazed to see the project became success. Even though it took several years of studies, they managed to complete it as a team.

PLENARY 5- FUN EXPERIMENTS WITH INANIMATE AND LIVING BACTERIA

Ajay Sood, a professor in Department of Physics at Indian Institute of Science, Bangalore will be conducting a lecture for the next slot. He tried to understand the beautiful phenomenon such as flocking, a self-organized motion of vast numbers individuals of same species in a common direction in his laboratory by working with inanimate polar granular objects made active by placing them on rapidly vibrating surface amongst spherical beads. They discovered that a small motile particles can coherently transport a large passive cargo which is suspected is potentially relevant to the understanding of flocking and other biological phenomena. The 3 rules could be seen through the movement of inanimate and living bacteria are separation, coherence, and alignment. He also added that the higher the number of species, the higher the competition and the flocking state. Biological phenomena are surprisingly able to apply in his studies of the inanimate and living bacteria.

PLENARY 6- CAN WE UNDERSTAND ANIMAL?

In his talk, he described some classic experiments in animal behaviour to illustrate their attempts to understand animal behaviour, the difficulties involved and how to overcome them. All the experiments were tested on insects such as bees and ants. For the first experiment, it involved the bees. How the bees find their way home and they concluded that bees use vision to identify their nest. The next experiment, he concluded that bees can distinguish different shade of colours. He then later continues with the other fascinating experiments.

CAMP SESSIONS (23-25 OCTOBER)

The aim for this session is to provide opportunity for further discussion or general discussion between Plenary Lectures or Eminent Scientists and smaller groups of students. This camp will last for 90 minute. In every camp, the Plenary Lecture started off with a short presentation.

CAMP 1- SHEAR THICKENING AND THINNING

This talk was about shear thickening and shear thinning. Some liquids behave differently when stress is applied (application of force). Shear thickening liquids increase in viscosity as stress increases. Shear thinning liquids decrease in viscosity as stress increases. During shearing, the structure and the flow of a matter will change. Daily life applications that are using the shear thinning concept are paints, cosmetic such as toothpaste and shampoo and food such as milkshake. For shear thickening, the application is liquid body armour which functions as bullet proof jacket.

CAMP 2- CAN WE UNDERSTAND ANIMALS?

This camp was conducted by Raghavendra Gadagkar, a full professor at the Centre for Ecological Sciences, Indian Institute of Science in Bangalore, India, He focused on small animals which is insects. To understand the animal behaviour, several classical and recent experiments had been performed. One of the experiments that had captivated me was on how an ant knows to choose the shortest path. What can they concluded was, the factors that affect the behaviour are the concentration of pheromone and they tend to follow the trails of others.

CAMP 3- CHEMISTRY IS FUN!

Uday Maitra, a chemist from department of organic chemistry Indian Institute of Science, Bengalore. The main purpose of his sessions is to let the young students know that learning and teaching chemistry can be a lot of fun. Several fun and thrilling experiment were conducted by him. One of them was chemiluminescence, the emission of light during a chemical reaction that does not produce significant quantities of heat. It was a colourful experiment. The properties of the matter that were used in the experiments were well explained by him

DIALOGUE SESSIONS

Dialogue session is a discussion between students and a successful Mid-Career Indian Scientist, to provide examples of how to be successful in scientific research under conditions. About 30 minutes will be given to the Mid-Career.

DIALOGUE 1- SPINTRONICS:PRESENT AND PRESPECTIVES

The first dialogue was conducted by P.S Anil Kumar from department of physics. He informed and explained about spintronic. Spintronic is the manipulation of electron using their spin to process information. Electronics is the manipulation of electron using their spin to process information. He showed how the spintronic work in an interactive way so the students are able to understand easily.

DIALOGUE 2- SUHAS GOPINATH'S BIOGRAPHY

During Suhas Gopinath session, he shared about his success as a professional web developer. When he was only 14, he was recognized as the world's youngest certified Professional web developer through his project coolhidustan.com. He also shared some tips on how to be a successful entrepreneurship like him. It was an inspiring talk as I able to understand the importance of entrepreneurship especially during this era.

EXCURSIONS

During excursion, we were divided into groups and for our bus there were Malaysian, Australian and Nepali. In each bus there will be a tour guide who will be explaining about the ancient history of the places in Mysore or Mysuru. Mysuru is the third most populous city in the state of Karnataka, India. It is located at the base of the Chamundi Hills about 146km southwest of the state capital Bangalore.

Palace of Mysuru was our first destination. It is a historical place in the state of Mysuru. It is a massive building with amazing and unique sculptures. The palace was commissioned in 1897, and its construction was completed in 1912. Only 25% of the palace is available for tourist and unfortunately photographs are prohibited in the palace. While walking through the palace, oil painting could be seen on every walls and each symbolizes a venerable history. Most of the paintings are still in perfect shapes.

The second stop was the zoo. Mysore zoo is located near the Mysore Palace and it is one of the city's most popular attractions. The zoo is currently home to ten elephants, and has more elephants than any other zoo in India. A total of 34 elephants have lived at this zoo, many of which were eventually transferred to other zoos. The zoo also has five green anacondas, contributed by Colombo Zoo. It also has giraffes, zebras, lions, tigers, white rhinoceroses, and baboons.

Visiting the Mysuru Palace during excursion session

CULTURAL ACTIVITIES

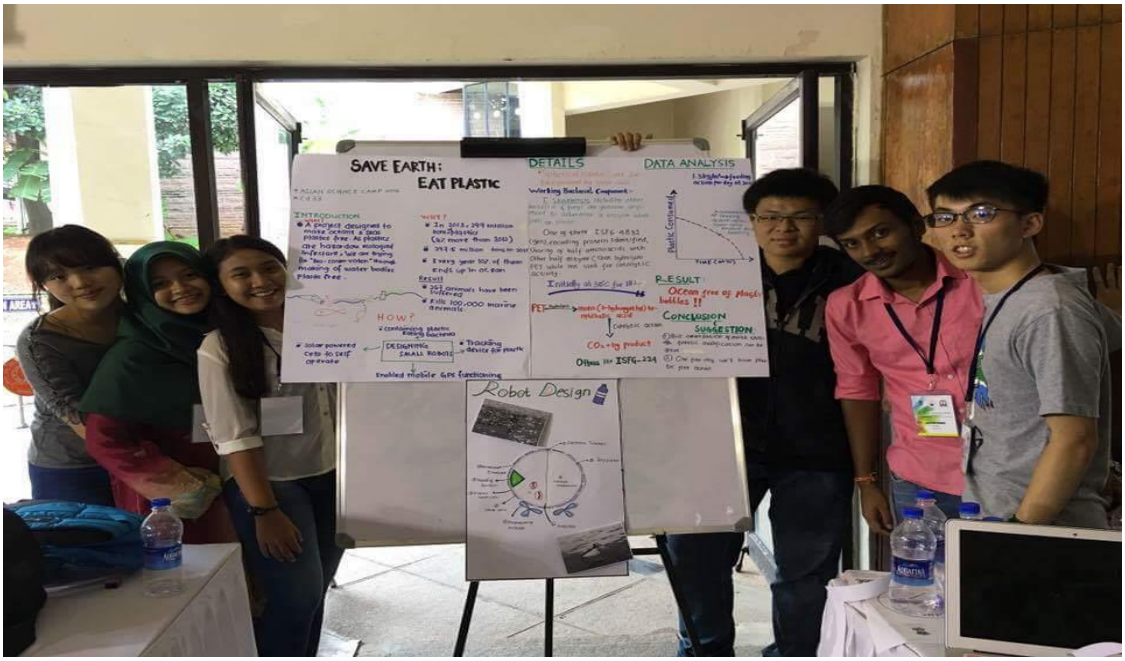
Four different styles of Indian classical dance were performed in the Tata Auditorium in IIsc. There were Bharatananatyam, Kathak, Kuchipidi and Odissiand. The duration for the performance was approximately about 1 hour. Different types and colour of clothes were worn during the performance. It was a great and thrilling experience as I was able to learn about the Indian cultures.

Every country also performed their traditional performance. For Malaysia, we dance ‘Tarian Endang’ which is originated from negeri Sembilan. The entire 9 participants from Malaysia wore red clothes and most of the steps of dance uses only hand movement. It was a great experience and we had lot of fun. Surprisingly, most of the spectators in the auditorium dance along joyfully.

After cultural performance

POSTER PRESENTATION

In my group, there were 6 members who originated from Indonesia, Nepal, Taiwan and South Korea. There were 3 themes to be chosen- Biology, Chemistry and physic. Our group, group number 33, chose Bio Conservation for our poster presentation. Basically our idea is to demolish plastics in the ocean by inventing a machine that takes up the wastes. The machine was sketched and all the information was written on a big paper. We waited for some time for the panel or judges to judge our presentation. Even though we waited for some time, it really paid off as we were selected to win the first price for the best poster presentation for biology.



My team- (from left Seohui, Nurliyana, Ayu Nanami, Jaseon, Ashish Poudel and Huang Yu-min)

Our group won the first place for poster presentation for biology (Bio Conservation)

FINAL REMARKS

Overall, this program manage to achieve its objectives which areto make new friends from all part of the countries and ask creative questions as well as learn to work as a team. I personally think that this camp help me to enhance my communication skill in English and to speak confidently in front of the crowd. I would like to thank Asasi Sains Pertanian(UPM), Dr Mohd Jamil(UM), Dr Yusrizam(UM) and to those who are responsible in giving me this chance to join this thrilling Asian Sciance Camp.

PREPARED BY,

NURLIYANA BINTI MOHD AMIN