



Faculty of Science  
The University of Hong Kong  
香港大學理學院

Getting into the World of

# S cience

Science Enrichment Programmes and Talks  
for Secondary School Students

- *Junior Science Institute (JSI)*
- *Talk @ My School Programme*
- *HKU Campus Visit*



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# Enrichment Programmes for Secondary Schools

As part of our commitment to community involvement, the Faculty of Science is dedicated to promote science literacy and serve the wider society. The Faculty offers three science hands-on types of enrichment programmes for secondary schools in the academic year 2010-11:

- **Junior Science Institute**

13 science hands-on learning workshops in different science disciplines are offered to SS1, SS2, F.6 and F.7 students.

- **Talk@MySchool Programme**

Our teachers and Faculty members will deliver admission and Science talks at local secondary and international schools. 41 science talks on different science topics ranging from the recent scientific discoveries to thematic science issues related to our daily life are offered to SS1, SS2, F.6 and F.7 students.

- **HKU Campus Visit**

Secondary school groups and public are welcome to visit our campus and laboratories, and enjoy fun-filled science demonstrations.

# Junior Science Institute

*We offer fun-filled science workshops!*

Junior Science Institute (JSI) was introduced by the Faculty in 2009. It offers science-rich experience to scientifically inclined senior secondary school students. The Faculty has designed a series of hands-on learning programmes to offer participating students a wider exposure to different science disciplines all year round. Through a variety of inspiring workshops, laboratory exercises, field trips, public lectures and other interactive activities, participants are able to embark on a journey of science exploration.

13 JSI workshops in the areas of Physics, Chemistry, Mathematics, Biological Sciences, Statistics and Earth Sciences were offered in 2009-10. 323 secondary school students in SS1, Forms 5 and 6 completed the programmes successfully. Students had an opportunity to learn different science disciplines.

*Let's hear from our past JSI participants for their unique experience:*

"The programme provides us with an opportunity to have close contact with the nature, which helps to increase our awareness of environmental protection."

"We can learn something outside the school curriculum and that is really interesting and inspiring."

"JSI allows me to explore different disciplines in science that I am interested in."



# JSI Event Calendar for 2010-11

JSI Workshop	Course Code	Level	Date		Time	Medium of Instruction	Remarks
			Class A 1 <sup>st</sup> semester (Nov 6, 2010)	Class B 2 <sup>nd</sup> semester (Mar 5, 2011)			
<b>Biological Sciences</b>							
Biological Evolution and Conservation	JSI 0010	SS2, F, 6, F, 7		✓	9:30 am – 5:00 pm	English	Exact date to be confirmed
Hong Kong Amphibians & Reptiles – Night Safari at Tai Po Kau Nature Reserve	JSI 0011	SS1, SS2, F, 6, F, 7	✓	✓	3:00 pm – 9:00 pm	English	Includes a field trip to Tai Po Kau Nature Reserve
Molecular Analysis of Genetically Modified (GM) Plants	JSI 0002	SS1, SS2, F, 6, F, 7	✓	✓	9:30 am – 5:00 pm	English	
<b>Chemistry</b>							
Colourful Food	JSI 0003	SS1, SS2, F, 6, F, 7	✓	✓	9:30 am – 6:00 pm	English	
The Magic of Polymers	JSI 0004	F, 6, F, 7	✓	✓	9:30 am – 5:00 pm	English	
<b>Earth Sciences</b>							
Discovering the Earth	JSI 0005	SS1, SS2, F, 6, F, 7	✓	✓	9:30 am – 5:00 pm	English	
<b>Mathematics</b>							
Mathematics – An Octopus I	JSI 0012	F, 6, F, 7	✓	✓	9:30 am – 6:30 pm		This workshop is running for 3 meetings: Nov 6, 13 & 20, 2010
Mathematics – An Octopus II	JSI 0013	F, 6, F, 7	✓	✓	9:30 am – 6:30 pm	Mainly Cantonese supplemented by English terminologies	This workshop is running for 3 meetings: Nov 6, 13 & 20, 2010
Mathematics – An Octopus III	JSI 0014	SS1, SS2, F, 6, F, 7		✓	9:30 am – 6:30 pm		This workshop is running for 3 meetings: Mar 5, 12 & 19, 2011
Mathematics – An Octopus IV	JSI 0015	SS1, SS2, F, 6, F, 7		✓	9:30 am – 6:30 pm		This workshop is running for 3 meetings: Mar 5, 12 & 19, 2011
<b>Physics</b>							
Astronomy Workshop	JSI 0016	SS1, SS2, F, 6, F, 7	✓	✓	7:00 pm – 9:30 pm	English	This workshop is running for 3 meetings: 1 <sup>st</sup> semester - Nov 6, 12 & 19, 2010 Summer – July 12, 15 & 19, 2011
Solar Cells	JSI 0008	F, 6, F, 7	✓	✓	9:30 am – 5:00 pm	English	
<b>Statistics and Actuarial Science</b>							
Probabilities, Statistics & Surveys	JSI 0017	SS1, SS2, F, 6, F, 7		✓	9:30 am – 5:00 pm	English	

Notes:

1. all workshops are held in HKU campus
2. classes A, B and C are identical. Students only need to enrol in one class
3. schedule of the workshops are subject to change; please check [www.hku.hk/science/hkujsi](http://www.hku.hk/science/hkujsi) for updates.

About the JSI Workshops

# Biological Sciences

JSI 0010

## Biological Evolution and Conservation

Teacher : Dr M SUN, School of Biological Sciences

Level : SS2, F. 6 , F. 7

How many species are there in the biological world? How did these species arise? Why is species diversity – as well as genetic diversity within each species – important to us? How can we protect biodiversity from further endangerment from human activities? This workshop aims to present scientific understanding of the origin of biodiversity and evolutionary processes, and refute various versions of creationism.

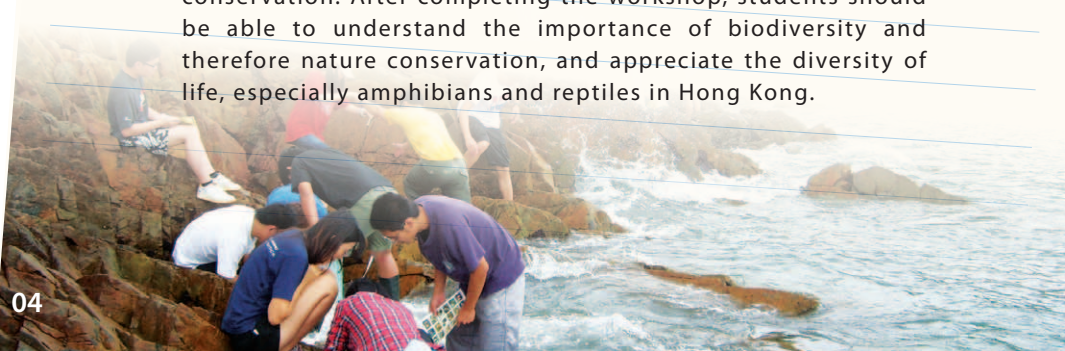
JSI 0011

## Hong Kong Amphibians & Reptiles – Night Safari at Tai Po Kau Nature Reserve

Teacher : Dr C H HAU, School of Biological Sciences

Level : SS1, SS2, F. 6 , F. 7

Night Safaris, especially for amphibians and reptiles, have become regular extra-curricular activities for Ecology & Biodiversity students in the last few years. Students found night safari amazing and have become much interested in biodiversity and nature conservation. The objectives of this workshop are to arouse students' interest in Hong Kong's amphibians and reptiles, and to enhance students' understanding of the importance of biodiversity and their conservation. After completing the workshop, students should be able to understand the importance of biodiversity and therefore nature conservation, and appreciate the diversity of life, especially amphibians and reptiles in Hong Kong.



JSI 0002

## Molecular Analysis of Genetically Modified (GM) Plants

Teacher : Dr C S C LO, School of Biological Sciences

Level : SS1, SS2, F. 6, F. 7

Genetically modified (GM) plants are successful examples of agricultural biotechnology. However, they are genetically indistinguishable from normal plants. Students will learn the concepts on GM plant production and will participate in a debate on their benefits and risks based on scientific arguments. They will also gain hands-on experience on the use of polymerase chain reaction (PCR) to detect modifications in plant materials.



# Chemistry

JSI 0003

## Colourful Food

Teacher : Dr A P L TONG, Department of Chemistry

Level : SS1, SS2, F. 6, F. 7

Colour is an important aspect in our enjoyment of food we eat. The objective of this workshop is to guide you to search the chemicals embedded in food and beverages that are responsible for colours. Through the understanding of a variety of molecular structures, chemical separations and analyses of some colourants in the project, you may get a taste of modern scientific research.

JSI 0004

## The Magic of Polymers

Teacher : Professor W K CHAN, Department of Chemistry

Level : F. 6, F. 7

It has been known for a long time that organic polymers are good insulators. In the 1970s, it was discovered that some organic polymers could exhibit electrical conductivity comparable to metallic conductors. The polymers contain conjugated systems on the polymer main chain in which electrons can be transported freely. In this workshop, the synthesis and of two common conducting polymers, polypyrrole and polyaniline will be demonstrated, and the conductivity of polymers will be tested by using a simple method. In addition, the applications of polymers in different aspects of our daily life will also be introduced.



# Earth Sciences

JSI 0005

## Discovering the Earth

**Teacher : Dr Z LIU, Department of Earth Sciences**

**Level : SS1, SS2, F. 6, F. 7**

Just about everything we use in our daily life comes from the Earth. The hands-on laboratory exercise gives an overview of the Earth Systems and its major geological processes. Students will learn about the properties of rocks and build their own mineral collection. The topic of global climate change will be covered too. A tour of Stephen Hui Geological Museum, the first geological museum in Hong Kong with a world-class collection of minerals will be arranged.



# Mathematics

JSI 0012

## Mathematics – An Octopus I

**Teachers :** multi-teachers, Department of Mathematics

**Level :** F. 6, F. 7

This is one of the two enrichment courses in mathematics offered to students of Forms 6 and 7. There will be 3 meetings and participants are expected to have some knowledge in Calculus. In this course, we intend to uncover the mathematics buried in our daily life: from the HK ID numbers, to the broccolis on your dinner plates, to the stock price movements in the stock market and many more. It would be quite a surprise how so many things are related to mathematics. Students are encouraged to tap into our interactive games to discover the mathematical world of their own. Three topics will be selected for this course from the following:

Games, Nash's Game Theory, Number Theory, Fractals, Graph Theory, Stock and Stock and Stock Options, Auction, Voting

**Remarks:**

*The teaching medium is Cantonese supplemented by English terminologies.*

JSI 0013

## Mathematics – An Octopus II

**Teachers :** multi-teachers, Department of Mathematics

**Level :** F. 6, F. 7

This is the second enrichment course in mathematics offered to students of Forms 6 and 7. Same as Mathematics – An Octopus I, there will be 3 meetings and participants are expected to have some knowledge in Calculus. Please refer to the abstract of Mathematics – An Octopus I for more details. Another three topics will be selected for this course from the following:

Games, Nash's Game Theory, Number Theory, Fractals, Graph Theory, Stock and Stock and Stock Options, Auction, Voting

**Remarks:**

*The teaching medium is Cantonese supplemented by English terminologies.*



**JSI 0014**

## Mathematics – An Octopus III

**Teachers : multi-teachers, Department of Mathematics**

**Level : SS1, SS2, F. 6, F. 7**

This is the one of the two enrichment courses in mathematics offered to students of SS1 or above. Knowledge in Calculus is not required and interactive participations are emphasized. There will be 3 meetings covering three topics from the following:

Games, Origami and Geometry, Probability, Group and Symmetry, Fibonacci Numbers, Recursive Relations, Number Theory, Puzzles and Paradoxes.

**Remarks:**

*The teaching medium is Cantonese supplemented by English terminologies.*

**JSI 0015**

## Mathematics – An Octopus IV

**Teachers : multi-teachers, Department of Mathematics**

**Level : SS1, SS2, F. 6, F. 7**

This is second enrichment course in mathematics offered to students of SS1 or above. Same as Mathematics – An Octopus III, there are 3 meetings and knowledge in Calculus is not required. This course will cover another three topics from the following:

Games, Origami and Geometry, Probability, Group and Symmetry, Fibonacci Numbers, Recursive Relations, Number Theory, Puzzles and Paradoxes.

**Remarks:**

*The teaching medium is Cantonese supplemented by English terminologies.*

# Physics



**JSI 0016**

## Astronomy Workshop

**Teacher : Mr S L CHEUNG, Faculty of Science**

**Level : SS1, SS2, F. 6, F. 7**

400 years ago, Galileo used a simple telescope but made revolutionary discoveries. Telescopes become much bigger nowadays, but small telescopes can still perform valuable scientific measurements. In this workshop, students will learn some basic astronomical observation techniques. The amount of practical observation will depend on the weather condition.

### **Remarks:**

*The workshop will be held in the evening of 3 separate days.*

**JSI 0008**

## Solar Cells

**Teacher : Dr A B DJURIŠIĆ, Department of Physics**

**Level : F. 6, F. 7**

There is an increasing interest in developing renewable, clean alternatives to traditional energy sources. Among different renewable energy technologies, solar energy is a very promising one. In this workshop, students will become familiar with low-cost alternatives to conventional silicon solar cells. Experiments in this workshop include making of dye solar cells with the use of natural dyes and characterization of those cells under white light illumination.

# Statistics and Actuarial Science

JSI 0017

## Probabilities, Statistics & Surveys

**Teacher : Dr K F LAM, Department of Statistics and Actuarial Science**

**Level: SS1, SS2, F. 6, F. 7**

This workshop will briefly introduce and explain some basic concepts of probability and statistics, with the use of daily life examples and illustration of experiments and games. Given an interesting real life example, participants will be asked to design an experiment or sample survey to collect relevant data, which will be explored, presented graphically and analyzed during the workshop.





## Recognition of Participation

Students who have successfully completed the HKUJSI workshops with satisfactory attendance will be awarded a certificate of attendance. Credits may also be given to participants of selected HKUJSI workshops for consideration of admission to the 6901 Bachelor of Science programme. Secondary School teachers may consider the HKUJSI activities to fulfill the Other Learning Experience (OLE) requirements in the new Senior Secondary School curriculum.

## Application

The programme is open for application online at [www.hku.hk/science/hkujsi](http://www.hku.hk/science/hkujsi). Students who are interested to apply should obtain endorsement from their teachers.

## Commitment Fee

All workshops are offered free of charge. However, a commitment fee of \$200 would be imposed when students accept the offer and the commitment fee will be fully refunded to students upon their successful completion of the workshops.

## Application period:

1<sup>st</sup> semester: September 1, 2010 - September 30, 2010

2<sup>nd</sup> semester: December 1, 2010 - January 15, 2011\*

Summer: May 1, 2011 - May 31, 2011\*

\* subject to change



# Talk @ My School Programme

*We deliver Admission and Science Talks at your school!*

**To** keep secondary school teachers and students informed of the Bachelor of Science programme and to promote science literacy, Faculty members will deliver admission talks and science talks at local secondary and international schools. Six departments/ school under the Faculty and the Department of Biochemistry in the Li Ka Shing Faculty of Medicine have devised a series of science talks for secondary school students. The topics range from subject knowledge to thematic science issues related to our daily life. Some of the science topics can also be considered as Other Learning Experience (OLE) in the New Senior Secondary curriculum.

70 admission and science talks were delivered in the academic year 2009-10. Science teachers of the secondary schools requested topics in different science disciplines enable students to explore their interest in science. The talks have reached out to more than 5,000 secondary school students.



# List of Science Talks 2010-11

Discipline	Science Talk Topics	Code	Level
<b>Biochemistry</b>	Changing the Genetic Blue Print of a Cell	ST0001	SS1, SS2, F.6, F.7
	From Basic Research to Drug Discovery	ST0002	F.6
	How We Are Using Evolution in the Test Tube at HKU to Solve Major Medical Problems	ST0003	F.6, F.7
	Understanding Cancer	ST0004	F.6
<b>Biological Sciences</b>	An Introduction to Ecology and Biodiversity	ST0005	SS1, SS2, F.6, F.7
	Environmental Risk Assessment: A Major Paradigm Shift in Environmental Management	ST0006	SS1, SS2, F.6, F.7
	Good Bugs for Clean Environment	ST0007	SS2, F.6, F.7
	Microbes Who Rule the World	ST0008	SS2, F.6, F.7
	What Doesn't Kill Them Makes Them Stronger: How Antibiotic Resistance is Developed in Bacteria?	ST0009	SS1, SS2, F.6, F.7
	When Boys Become Girls: Ecological Impacts of Endocrine Disrupting Chemicals	ST0010	SS1, SS2, F.6, F.7
<b>Chemistry</b>	Chemistry of Metals in Medicine	ST0011	F.6, F.7
	How Aspirin, Morphine and Other molecules Changed the World	ST0012	F.6, F.7
	Magnets in Action: Principles and Application of Nuclear Magnetic Resonance and Magnetic Resonance Imaging	ST0013	F.6, F.7
	Molecules for Liquid Crystal Displays	ST0014	F.6, F.7
<b>Earth Sciences</b>	Are We Alone: The Search for Planets around Other Stars	ST0015	SS1, SS2, F.6, F.7
	Climate Change	ST0016	SS1, SS2, F.6, F.7
	Early Life on Earth	ST0017	SS1, SS2, F.6, F.7
	Earthquakes	ST0018	SS2, F.6, F.7
	Geology and Landscapes of Hong Kong	ST0019	SS2, F.6, F.7
	Plate Tectonics	ST0020	SS2, F.6, F.7



Discipline	Science Talk Topics	Code	Level
<b>Mathematics</b>	Can You Distinguish a Doughnut from a Coffee Cup?	ST0021	SS1, SS2, F.6, F.7
	Dynamic Optimization and Complexity	ST0022	F.6, F.7
	Game Theory: The Winning Strategy	ST0023	SS1, SS2, F.6, F.7
	Stock and Stock Options	ST0024	SS2, F.6, F.7
	The Wonderful World of 0 and 1	ST0025	SS1, SS2, F.6, F.7
	Thinking Recursively/ Iteratively	ST0026	SS2, F.6, F.7
<b>Physics</b>	400 Years of Telescope	ST0027	SS1, SS2, F.6, F.7
	A New Light Source for the 21 <sup>st</sup> Century : Solid State Lighting	ST0028	F.6, F.7
	Deep Sky Objects	ST0029	SS1, SS2, F.6, F.7
	Einstein's Biggest Blunder?	ST0030	F.6, F.7
	Hubble Space Telescope	ST0031	SS1, SS2, F.6, F.7
	Mars Exploration	ST0032	SS1, SS2, F.6, F.7
	Planets around Other Stars	ST0033	F.6, F.7
	Recent Discoveries in the Solar System	ST0034	SS1, SS2, F.6, F.7
	Renewable Energy	ST0035	F.6, F.7
	Solar Energy	ST0036	F.6, F.7
	The Sun : Our Nearest Star	ST0037	F.6, F.7
	White Dwarfs, Neutron Stars and Black Holes	ST0038	F.6, F.7
<b>Statistics and Actuarial Science</b>	Interesting Things about Interest Rates	ST0039	SS2, F.6, F.7
	Seeing Tomorrow: Decision Making under Risk	ST0040	SS2, F.6, F.7
	Statistics: The Art of Scientific Reasoning	ST0041	SS2, F.6, F.7

# About the Science Talks

# Biochemistry



ST0001

## ★ Changing the Genetic Blue Print of a Cell

Level: SS1, SS2, F. 6, F. 7

The genetic information in all of us is encoded in the DNA in each cell. In this workshop, you will learn how a cell is regulated through the information in the DNA and the ways in which we can manipulate DNA in test tube or in a cell, and its impact in life.

ST0002

## ★ From Basic Research to Drug Discovery

Level: F. 6

The talk will cover Biological Universality – the importance of using model organism; illustrations using several Nobel prize-awarded studies; and approaches for drug discovery – small molecules secreted proteins: cell therapy.

ST0003

## ★ How We are Using Evolution in the Test Tube at HKU to Solve Major Medical Problems

Level: F. 6, F. 7

We are evolving nucleic acids to help diagnose malaria and to develop potential therapy of several diseases. Here, we show that evolution is not just a theory but an experimental fact.

ST0004

## ★ Understanding Cancer

Level: F. 6

The talk will cover the discovery of oncogenes, how a normal gene might become oncogene, and finally how anti-cancer drugs can be developed to target oncogenes.

# Biological Sciences

ST0005

## ★ An Introduction to Ecology and Biodiversity

Level: SS1, SS2, F. 6 , F. 7

The United Nations has declared 2010 as the International Year of Biodiversity to raise people's awareness on the importance of biodiversity. In this talk, basic concepts of ecology and biodiversity, especially in relation to conservation, and the importance of biodiversity such as offering us ecosystem goods and services will be introduced. The status of the world's biodiversity, conservation efforts are needed to sustain biodiversity, and the world's life supporting systems will also be discussed.

ST0006

## ★ Environmental Risk Assessment: a Major Paradigm Shift in Environmental Management

Level: SS1, SS2, F. 6 , F. 7

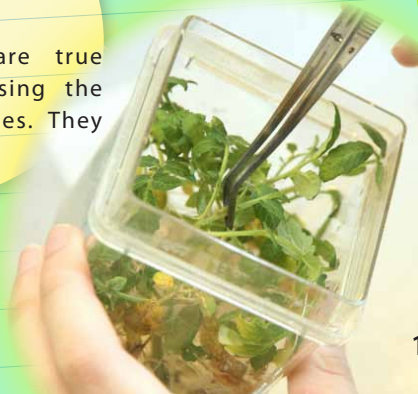
This talk will introduce the fundamental concepts of environmental risk assessment of toxic chemical pollutants, and explore various ways to characterize and manage their risks with examples.

ST0007

## ★ Good Bugs for Clean Environment

Level: SS2, F. 6, F. 7

Though tiny to our eyes, microbes are true environmental engineers actively processing the waste from human and industrial activities. They also help us to recycle useful nutrients.



**ST0008**

## ★ **Microbes Who Rule the World**

**Level: SS2, F. 6, F. 7**

Micro-organisms were the first colonizers of the Earth and they subsequently change the planet in many different ways, including the initial oxygen produced and consumption of green-house gas methane.

**ST0009**

## ★ **What Doesn't Kill Them Makes Them Stronger – How Antibiotic Resistance is Developed in Bacteria**

**Level: SS1, SS2, F. 6, F. 7**

The emergence and prevalence of antibiotic resistance has imposed serious problems to modern society. This talk focuses on explaining how antibiotic resistance is developed in bacteria and raising public attention to reduce, prevent and combat this serious problem.

**ST0010**

## ★ **When Boys Become Girls: Ecological Impacts of Endocrine Disrupting Chemicals**

**Level: SS1, SS2, F. 6, F. 7**

This talk will introduce the basic biological mechanisms to determine sexes in animals and explain why chemical pollutants can influence the hormonal systems and lead to sex changes in wildlife.



# Chemistry



ST0011

## ★ Chemistry of Metals in Medicine

Level: F.6, F.7

This talk is about the important roles that metals have played in the history of medicine.

ST0012

## ★ How Aspirin, Morphine and Other Molecules Changed the World

Level: F.6, F.7

The historical roles of Aspirin, Morphine and other molecules will be discussed and the stories about their discoveries will also be told.

ST0013

## ★ Magnets in Action: Principles and Applications of Nuclear Magnetic Resonance and Magnetic Resonance Imaging

Level: F.6, F.7

The principles of nuclear magnetic resonance will be discussed briefly and its applications, in particular magnetic resonance imaging, will be covered in this talk.

ST0014

## ★ Molecules for Liquid Crystal Displays

Level: F.6, F.7

Principles of liquid crystal display and the molecules used will be discussed.

# Earth Sciences

ST0015

## ★ Are We Alone: The Search for Planets around Other Stars

Level: SS1, SS2, F.6, F.7

Recent advances in astronomy have revealed the existence of many planetary bodies in other stellar systems. What do these planets look like? How do scientists detect their presence? Are they habitable?

ST0016

## ★ Climate Change

Level: SS1, SS2, F.6, F.7

This is a pictorial presentation on the greenhouse effects, current debate on global climate change, and the methods scientists used to reconstruct climatic variations.

ST0017

## ★ Early Life on Earth

Level: SS1, SS2, F.6, F.7

The talk describes recent findings on how life appeared and evolved during Earth's early days, and how telltale signs from some peculiar ancient rocks bear information on Earth's early environment.

ST0018

## ★ Earthquakes

Level: SS2, F.6, F.7

Why are there earthquakes? How are they measured? Are there earthquakes in Hong Kong? Can they be predicted? The talk uses recent earthquake events to address these questions.



ST0019

## ★ Geology and Landscapes of Hong Kong

Level: SS2, F.6, F.7

This talk is a virtual tour to fascinating localities of geologic interest around Hong Kong, and discusses issues pertaining to preservation of geological heritage.

ST0020

## ★ Plate Tectonics

Level: SS2, F.6, F.7

The presentation gives an overview of Plate Tectonics Theory, the driving mechanism of plate motion, and major geological processes in the Earth history.



# Mathematics



ST0021

## ★ Can You Distinguish a Doughnut from a Coffee Cup?

Level: SS1, SS2, F. 6, F. 7

This is an introduction to Topology by examples. No rigorous mathematics is involved.

ST0022

## ★ Dynamic Optimization and Complexity

Level: F. 6, F. 7

It is a brief sketch of an optimization technique termed Dynamic Programming and its assertive implication on the required computation effort decision problems.

ST0023

## ★ Game Theory – The Winning Strategy

Level: SS1, SS2, F. 6, F. 7

In this talk, students will play a number of interesting games and learn the mathematics related to them. In particular, students will learn how to apply Zermelo's theorem in game theory to study these games.

ST0024

## ★ Stock and Stock Options

Level: SS2, F. 6, F. 7

In this talk, we will describe how mathematics are involved in the trading of stocks and stock options. Our goal is to display the key concept of arbitrage and risk-neutral.



ST0025

## ★ The Wonderful World of 0 and 1

Level: SS1, SS2, F. 6, F. 7

The digital world, the wonderful world of 0 and 1, you are probably familiar with one of her faces through surfing the Internet using netbook, playing music with iPod, chatting through MSN, etc. This talk, however, would like to show you another face of this wonderful world. It turns out that mathematics provides solid underlying principle for this world, and nearly all branches in mathematics, such as, algebra, geometry, analysis, and so on, can find their application in this world.

ST0026

## ★ Thinking Recursively/ Iteratively

Level: SS2, F. 6, F. 7

Recursive/ Iterative problem solving approaches are popular scientific computing methods. In this talk, students will be guided to compute the square root of 500 (without using the square root operation) approximately by recursive/ iterative ideas. Students are expected to experience the power of numerical computing.



# Physics

ST0027

## ★ 400 Years of Telescope

Level: SS1, SS2, F. 6, F. 7

In 1609, Galileo pointed the telescope to the sky and made a scientific revolution. Not only that the physical vision was widened, but the human understanding of the cosmos was also totally changed. Larger telescopes were built, and nowadays telescopes come in different fashions and some of them are even placed in space. Using telescopes, astronomers discovered planets, the Big Bang, accelerating universe, etc.

ST0028

## ★ A New Light Source for the 21<sup>st</sup> Century – Solid State Lighting

Level: F. 6, F. 7

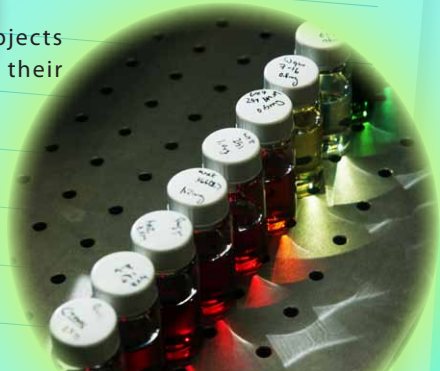
Throw away conventional light bulbs and fluorescence lamps! This talk will introduce new ways to light up your room by solid state devices. Give you a hint: some have already been used in Hong Kong.

ST0029

## ★ Deep Sky Objects

Level: SS1, SS2, F. 6, F. 7

This talk will introduce several interesting objects in the sky – nebulae, star clusters, galaxies, their properties and how they can be observed.



**ST0030**

## ★ Einstein's Biggest Blunder?

**Level: F. 6, F. 7**

Do you know that Einstein made a big mistake in his view of the universe? This talk will tell you the recent observational results that show how wrong Einstein was on this issue. The implications of these findings are also highlighted.

**ST0031**

## ★ Hubble Space Telescope

**Level: SS1, SS2, F. 6, F. 7**

Hubble Space Telescope is the most advanced and successful scientific project in human history. It drove astronomy into a new era, it witnessed collision of comet into Jupiter, monitored lives of stars, captured galaxy collisions, glimpsed space monsters – supermassive black holes, and revealed mystery of the biggest explosion since Big Bang - the Gamma Ray Burst events etc...

**ST0032**

## ★ Mars Exploration

**Level: SS1, SS2, F. 6, F. 7**

In recent years, Mars has become the hottest place for planetary exploration. Under the global network of Mars missions, spacecrafts discovered water ice on Mars, provided high resolution mapping. Rovers discovered the ancient sedimentary rocks that directly proved existence of water on the red planet.

**ST0033**

## ★ Planets around Other Stars

**Level: F. 6, F. 7**

We all know of the eight major planets in our Solar System, but do you know that astronomers have observed many planets outside our Solar System? This talk will tell how these planets are found and the implications of the findings.

ST0034

## ★ Recent Discoveries in the Solar System

Level: SS1, SS2, F. 6, F. 7

This talk will summarise recent discoveries in our Solar System through the observational results of a few space probes.

ST0035

## ★ Renewable Energy

Level: F. 6, F. 7

The talk will introduce several sources of renewal energy and evaluate their potentials from a scientific perspective.

ST0036

## ★ Solar Energy

Level: F. 6, F. 7

This talk will cover the making and usage of solar cells and how this can be used to solve part of our sustainable energy problem.

ST0037

## ★ The Sun: Our Nearest Star

Level: F. 6, F. 7

This talk will introduce the properties and recent observational results on the Sun – our nearest star. The focus is on how astronomers find them rather than simply a talk on “known facts”.

ST0038

## ★ White Dwarfs, Neutron Stars and Black Holes

Level: F. 6, F. 7

This talk is about three types of “dead” astronomical objects – white dwarfs, neuron stars and black holes. The talk will cover some of their interesting properties and why astronomers are so interested in them.



# Statistics and Actuarial Science

ST0039

## ★ Interesting Things About Interest Rates

Level: SS2, F. 6, F. 7

This talk will introduce some basic concepts and characteristics about the operation of interest rates. We will also briefly look at some relationships between interest rates and other economic variables.

ST0040

## ★ Seeing Tomorrow: Decision Making Under Risk

Level: SS2, F. 6, F. 7

The world is uncertain and success or failure largely depends on how well you make decision under risk. The key to success is not to rely on yesterday's news, but to ask what could happen tomorrow. This talk will describe the principles of risk management with intriguing examples from recent financial crises.

ST0041

## ★ Statistics: The Art of Scientific Reasoning

Level: SS2, F. 6, F. 7

For over a century statistics has provided scientists, and practitioners alike, with an important tool for data analysis, for reasoning and for drawing inference. This talk will explore the wide range of applications of statistics through real-life examples.



# About the Admission Talk

The Faculty of Science has introduced a *Single Admission Policy* for its **6901 Bachelor of Science Programme** since September 2007. This policy provides students with a choice of science majors using one degree programme choice 6901 Bachelor of Science in the application. The following science majors will be available for students admitted in September 2011:

Astronomy

Biochemistry

Biology

Biotechnology

Chemistry

Earth Sciences

Ecology & Biodiversity

Environmental Science

Food & Nutritional Science

Mathematics

Mathematics/Physics

Microbiology

Physics

Risk Management

Statistics

In order to keep secondary school teachers and students informed of our 6901 Bachelor of Science Programme, the admission policy and also the curriculum, our Faculty members are pleased to deliver an Admission Talk in your school at a time requested by you.

## Request for Science Talk or Admission Talk

Schools interested in a Science Talk or an Admission Talk can apply online at <http://www.hku.hk/science/community/>

### NOTE:

- 1 Please make your request at least 1-month in advance
- 2 A minimum of 30 students is required for a Science Talk and an Admission Talk to be arranged
- 3 The Faculty of Science will try to arrange the admission talk or the Science talk at the date/ time for the preferred topic requested. However, there might be circumstances that the talks cannot be arranged due to the commitment of the teachers.

The background of the page is a collage of images from the HKU campus. At the top, there is a large, ornate, light-colored stone building with a prominent tower and arched windows, partially framed by dark green leaves. Below this, the text 'HKU Campus Visit' is written in a large, bold, blue font. Underneath the title, a red cursive-style text reads 'We welcome you to visit our campus and facilities!'. The lower half of the page features a photograph of a brick building with a white entrance. In the foreground, a young man and woman are sitting on a wooden bench, looking at a large blue folder or map. The man is wearing a blue shirt and dark pants, and the woman is wearing a white top and dark skirt with brown boots. In the background, another person is sitting on a ledge of the brick building, reading a book. The overall scene is bright and sunny, with shadows cast on the ground.

# HKU Campus Visit

*We welcome you to visit our campus and facilities!*

The Faculty welcomes secondary school groups and public to visit our campus and facilities. Laboratory tours, science-rich and fun-filled demonstrations are designed to arouse visitors' interest and appreciation of science.

Secondary Schools interested in the Campus Visit can contact the Faculty direct at [ssst@hku.hk](mailto:ssst@hku.hk) to make a request.



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