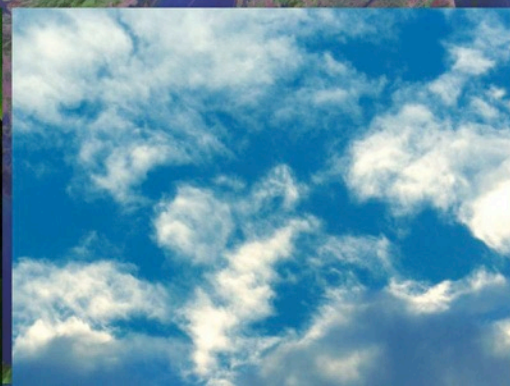




地球系統科學

EARTH SYSTEM

SCIENCE PROGRAMME



Earth System Science Programme

地球系統科學課程

Tel: 3943 9624

Fax: 3942 0970

Email: essc@cuhk.edu.hk

香港中文大學理學院
Faculty of Science, CUHK

如果你...

- 想瞭解地球系統如何運作
- 想擁有良好數理基礎，又可應用科學知識參與解決21世紀的一些重大環境問題（如全球環境變化、氣候轉變、空氣及水污染、自然與地質災害、能源開發等）

If you want to...

- Understand how the Earth system operates
- Acquire good quantitative skills and apply scientific principles to solve some of the most pressing environmental problems (e.g. global and environmental climate changes, air and water pollution, natural and geological hazards, energy/resources exploration...)

地球系統科學 Earth System Science

全球暖化與北極海冰融化



地球系統科學 Earth System Science

日本熊本地震 2016 年4月

Youtube "Kyodo News"



地球系統科學 Earth System Science

Super Typhoon Haima 颱風海馬 2016年10月



東網

香港天文台**21**年以來首次在**10**月
發出八號熱帶氣旋警告信號

地球系統科學 Earth System Science

Beijing 北京 2014 年11月



SERENH DONG/CNN



“APEC Blue”

Getty Images

(Photo credit to CNN)

全球環境變化 Global Environmental Change



氣候變化



空氣污染



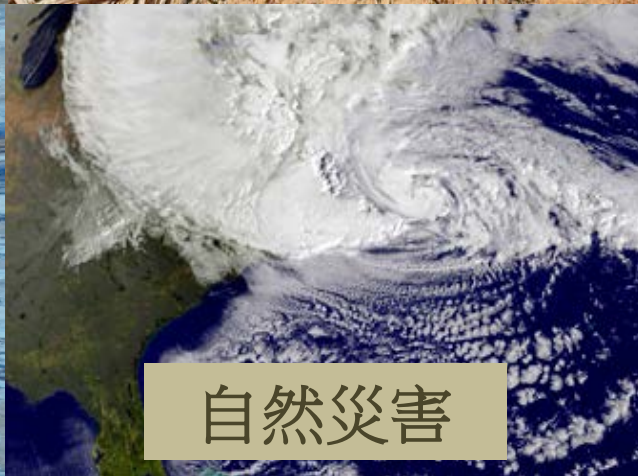
糧食危機



公共衛生



水污染



自然災害



生物多樣性

如果你...

- 想瞭解地球系統如何運作
- 想擁有良好數理基礎，又可應用科學知識參與解決21世紀的一些重大環境問題（如全球環境變化、氣候轉變、空氣及水污染、自然與地質災害、能源開發等）

地球系統科學就是對的選擇

If you want to...

- Understand how the Earth system operates
- Acquire good quantitative skills and apply scientific principles to solve the some of the most pressing environmental problems (e.g., global environmental and climate change, pollution, natural and geological hazards, energy / resources exploration...)

ESSC is the right choice for you!

Two Paths to Join This New and Unique Programme

兩種途徑選讀這個嶄新獨特的本科主修課程：

- 2016年開始, 已有明確主修意向的同學, 可以直接透過『**地球系統科學**』收生計劃 (JS4633) 修讀ESSC→大氣科學/地球物理學
- 從2012年開始, 可透過『**理學**』大類收生計劃 (JS4601) 主修ESSC

Earth System Science Undergraduate Curricula @ CUHK

2016 Applicants could join us via

- ✓ **JUPAS 4633 *Earth System Science Programme* → Atmospheric Science / Geophysics**
- ✓ **JUPAS 4601 *CUHK Science Broad-based Admission Scheme* → ESSC Major**

● 學習和研究地球系統中各圈層的運作過程，以及它們之間的相互作用對地球環境所產生的影響。

● Study all “spheres” of the Earth system, and how their interactions shape the Earth’s environment



課程內容 Curriculum

- 這些系統部份包括大氣圈、水圈、冰雪圈、岩石圈和生物圈等。透過學習這些部份的運作情況，可以瞭解及參與減輕自然和人為的環境威脅。

- The system consists of the atmosphere, hydrosphere, cryosphere, geosphere and biosphere. Via studying their processes, we understand and help mitigate natural and man-made environmental threats.



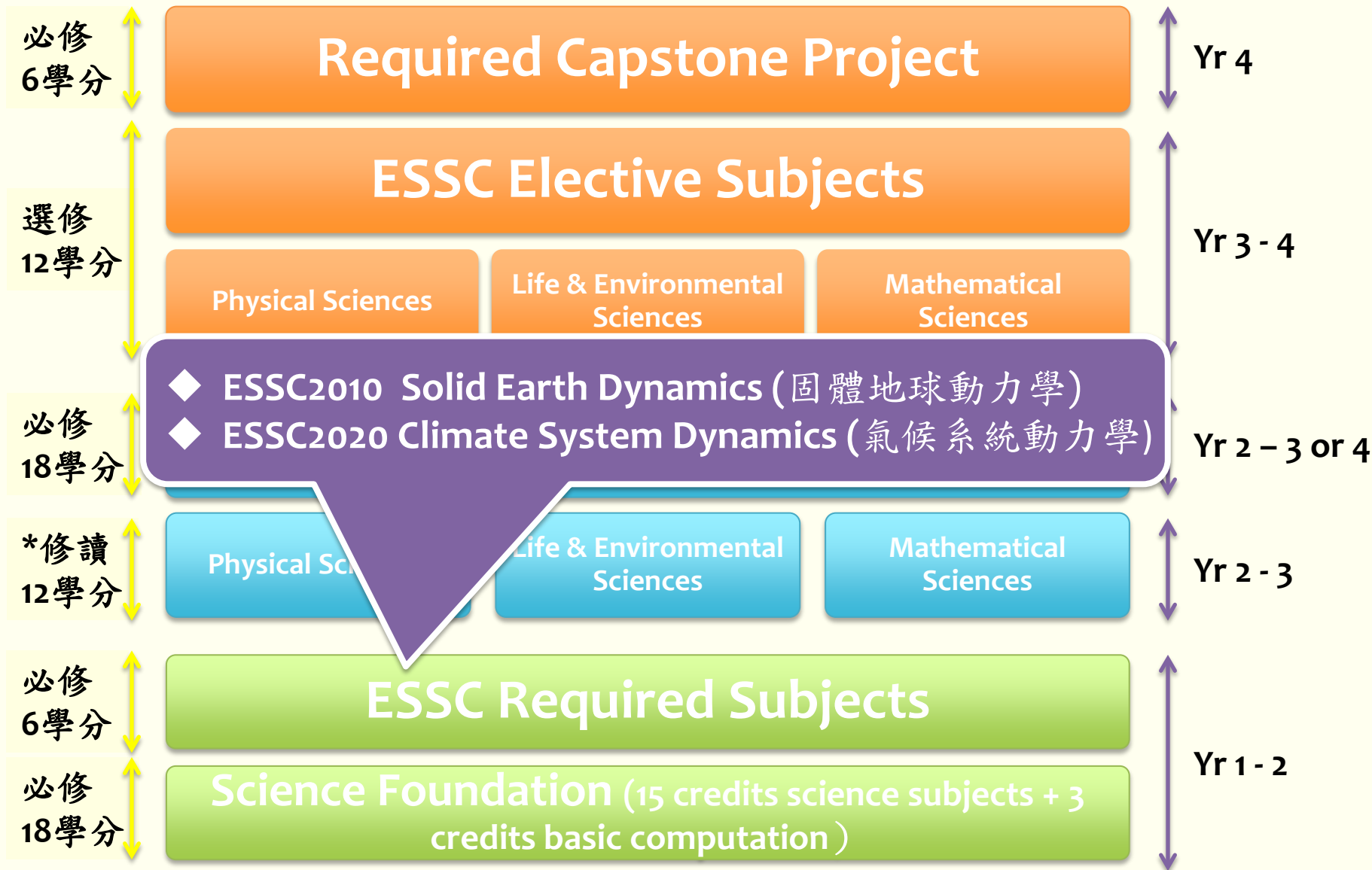


Curriculum Design

- ✓ Building upon traditional science disciplines, including, e.g., **geology** (地質學), **meteorology** (氣象學), and **oceanography** (海洋學), we aim to establish an exciting **interdisciplinary** programme in Earth System Science (地球系統科學是一個橫跨傳統學科的嶄新課程).
- ✓ We aim to equip students with a solid foundation in **basic sciences** (physics, chemistry, biology), **quantitative skills** (statistics, computation), and **practical knowledge** of the Earth System, so that they are prepared to participate in tackling the various **environmental challenges** facing us today.

地球系統科學 Earth System Science

注：修畢以下72學分就可完成地球系統科學主修課程，修畢共123學分就可從本科畢業



A Stimulating Way to Start Your Journey

ESSC2010 Solid Earth Dynamics (固體地球動力學)

- ✓ Under the scientific framework of plate tectonics theory, this course explores the physics and chemistry of the Earth, and a diversity of geologic phenomena over a broad spectrum of temporal and spatial scales.
- ✓ Exciting topics include: earthquakes and volcanoes, mysteries of minerals and rocks, use of earthquake waves to probe interior of the earth.

ESSC2020 Climate System Dynamics (氣候系統動力學)

- ✓ An integrated introduction to the climate system, emphasizing the dynamics of the atmosphere and its physical and chemical interactions with other Earth system components.
- ✓ Applies basic scientific and mathematical principles to explain the history, current state and future of weather and climate, natural hazards, and climate change under natural variability and anthropogenic influences.

注：修

必修
6學分

選修
12學分

- ◆ ESSC3100 Structural Geology (構造地質學)
- ◆ ESSC3120 Physics of the Earth (地球物理)
- ◆ ESSC3200 Atmospheric Dynamics (大氣動力學)
- ◆ ESSC3220 Atmospheric Chemistry (大氣化學)
- ◆ ESSC3300 Ocean and Climate (海洋與氣候)
- ◆ ESSC3320 Hydrogeology (水文地質學)
- ◆ ESSC3600 Understanding Our Biosphere (認識我們的生物圈)
- ◆ ESSC3800 Global Environmental Change (全球環境變化)

必修
18學分

*修讀
12學分

必修
6學分

必修
18學分

ESSC Required Subjects

Physical Sciences

Life & Environmental Sciences

Mathematical Sciences

ESSC Required Subjects

Science Foundation (15 credits science subjects + 3 credits basic computation)

Yr 2 - 3 or 4

Yr 2 - 3

Yr 1 - 2

- **Continuum Mechanics (連續介質力學)**
- **Geoscience Field Course (野外地質實習)**
- **Engineering Geology (工程地質學)**
- **Petrology (岩石學)**
- **Geomorphology (地貌學)**
- **Seismology (地震學)**
- **Land-Atmosphere Interaction and Boundary Layer Dynamics (邊界層動力學及地氣相互作用)**
- **Tropical Meteorology (熱帶氣象學)**
- **Aerosol Physics and Chemistry (氣溶膠物理與化學)**
- **Statistical Methods and Modeling (統計方法與模型)**
- **Geospatial Information Management and Analysis (地球空間信息管理與分析)**
- **Remote Sensing (遙感)**
- **Numerical Methods and Modeling for Earth System Science (地球系統科學的數值方法與模型)**

兩個專修組別 Two Specialized Streams

ESSC students can choose a specialized stream for more in-depth studies in one of two sub-disciplines.

❖ **Atmospheric Science Stream (大氣科學組)**

- ✓ **Students in this stream undertake in-depth studies related to Atmospheric Sciences.**
- ✓ **They will take advanced undergraduate level courses such as atmospheric dynamics and chemistry, meteorology, oceanography, air pollution, numerical/statistical methods and other related courses.**

❖ **Geophysics Stream (地球物理組)**

- ✓ **Geophysics focuses on studying the Earth using gravity, magnetic, electrical and seismic methods.**
- ✓ **Students will acquire solid physical and mathematical foundations and quantitative understanding of the solid Earth: surface and internal structures, dynamics, geohazards and mitigation, exploration of mineral and natural resources.**

野外工作及校外實習 Field Work and Internship

To enhance the student's experience beyond a campus setting, internships and field trips are integral components of the curriculum.



Mannie Kam,
HKO Placement Programme, 2014



2016年浙江大学—香港中文大学暑期联合课程合影留念

2016.8.9



ESSC4160 Field Course, Hangzhou, 2016 Summer

O-Night, Sep 16, 2015



野外考察 Field Trips

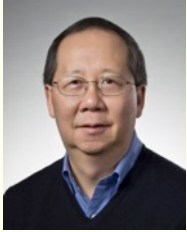
ESSC3110 Geoscience Field Course (地球科學野外課程)

- ✓ Study structural geology and petrology in the field. In 2014-2016 we collaborated with Peking University to conduct field course at Wutaishan, Shanxi.



地球系統科學 Earth System Science

Current Teaching Staff



Teng-fong WONG (黃庭芳), Professor & Programme Director
Ph.D., MIT; Former Chair, Dept. of Geosciences, Stony Brook University
Areas: Earthquake mechanics, rock physics applied to natural resources, environmental hydrogeology.



Lin LIU (劉琳), Assistant Professor
Ph.D., U. of Colorado, Boulder; George Thomson Postdoctoral Fellow, Stanford
Areas: Remote sensing applied to earth system science, evolution of cryosphere, global environmental change



Hongfeng YANG (楊宏峰), Assistant Professor
Ph.D., Seismology, Saint Louis University
Areas: Subduction zone dynamics and megathrust earthquakes, High-resolution imaging of crustal fault zones and subsurface structure, Earthquake detection and location, Earthquake source mechanics



Tammy Pui Yuk TAM (譚佩玉), Lecturer
Ph.D., HKU; Postdoctoral Fellow, Assistant Lecturer, HKU
Areas: Metamorphic Petrology and Geochronology, Structural Geology

■中大教授劉琳遠赴位於北極的格陵蘭島，考察冰川融化情況。

港專家冰川考察

拆解北極 氣候炸彈



新聞故事 極地救兵

高溫屢創新高，全球暖化危機加深。

中大教授劉琳聯同一班科學家化身「氣候戰士」，傾盡六年的時光，研究世界最大的島嶼、北極圈的格陵蘭島冰川融化的危機。透過觀察衛星圖像變化，他發現格陵蘭島最後一片穩定的東北冰川，十年來以驚人速度大量消融，更有「崩塌危機」，隨時全部崩落海中成為「氣候炸彈」。

記者 麥凱淇

位於北極圈內的格陵蘭，是全球最大的島嶼，亦是繼南極洲後，全球第二大冰川，一直以來被視為全球暖化的指標。格陵蘭冰川出現融化危機，「過去二十年，全球海平面過去上升了三點二毫米，其中約六分一的海水是來自格陵蘭冰川。假如格陵蘭冰川全部消融，全球海平面會上升六米。我們首次發現，格陵蘭最後一片穩定的東北冰川，可能隨時崩塌。」中大教授劉琳說。

劉琳與來自五個國家的十三位科學家，六年來用不同的方式觀察格陵蘭冰川的變化，他主力透過衛星雷達的影像，觀察冰川的流動，「我每月都會拍攝格陵蘭冰川的衛星照片，仔細比較冰川的流動距離，發現冰川在的流速在過去十年，從五百米加速至六百米。換言之，冰片正在不斷消失。另一方面，十幾公里厚的冰川，從二〇〇三年每年遞減一米，現加速至二〇〇六年起，每年遞減五米。」

冰川不但按年遞減，更有可能一瞬間內全部崩落瓦解，「冰川底部開始消融，大

量的海水存於冰川之下，令冰川前端浮在水面，整個冰川變得不穩定，有可能整塊崩塌，誰也不知道這情況會否在短時間內出現，這是個未知的問題，令人擔憂。」

劉琳說，過去五十年，北極暖化加劇，不但加速冰川融化，亦令北極生態大受影響，「原本冰可以反射太陽的輻射，但冰川融化後，原來冰的位置變成海水，直接吸收太陽的熱力，海水受熱膨脹後，水平面上升，加劇北極暖化，北極熊無可避免受影響。我們科學家都很驚訝北極的氣候及生態正快速地改變。」

監察青藏冰川變化

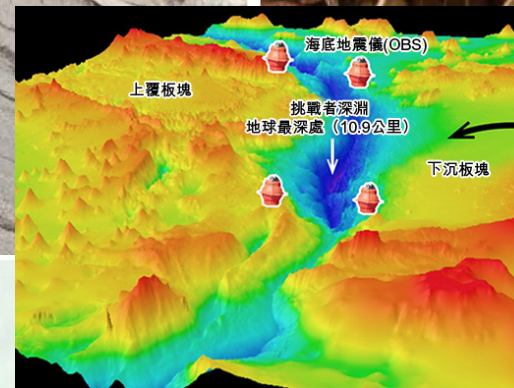
從事冰川研究多年的劉琳，有科學家的使命感，希望科學的方法有助解決氣候問題，「全球暖化的問題嚴重，身為科學家，我也想透過研究去尋找解決的方法。近年，不同的科學家正努力試驗，想出不同的方法。」除了繼續留意格陵蘭冰川，他正致力研究青藏高原上五萬塊冰川的變化，他說：「冰川的研究非常有意思，對人類有作用。近年青藏高原的冰川亦有顯著的變化，而這五萬塊冰川，每個的變化不一，很多未知的因素包含其中。」

劉琳指，格陵蘭島的氣候近年顯著變化，東北冰川更有可能隨時全部崩塌及消融。

Professor LIU Lin
Earth System Science Programme

上帝發怒時：地震的科學

When God's Wrath Visits: The Science of Earthquakes



Professor Yang Hongfeng & Professor Wong Teng Fong
Earth System Science Programme

解開地震和深海之謎

地震會造成重大破壞和人命傷亡，有時候還會引發巨大海嘯，2004年蘇門答臘和2011年日本東北的地震就是明證。要減少地震帶來的損失，就要對這種自然災害的物理學有根本的了解。

ESSC is the only programme in Hong Kong that offers courses in **seismology** (地震學).

地球系統科學 Earth System Science

Current Teaching Staff



Gabriel N. C. LAU (劉雅章), Director, CUHK Institute of Environment, Energy and Sustainability; Professor by Courtesy

Ph.D., U. of Washington; Professor, GFDL/Princeton

Areas: Dynamics of atmospheric circulation, atmosphere-ocean interactions, model simulations of atmospheric variability, impacts of climate change



Amos P. K. TAI (戴沛權), Assistant Professor

Ph.D., Harvard; Croucher Postdoctoral Fellow, MIT

Areas: Atmospheric chemistry & physics, climate-chemistry-biosphere interactions, impacts of global environmental change



Man-nin CHAN (陳文年), Assistant Professor

Ph.D., Caltech; Postdoctoral Fellow, Lawrence Berkeley Nat. Lab.

Areas: Atmospheric chemistry, composition and chemistry of organic aerosols, aerosol instrument techniques



Francis C. Y. TAM (譚志勇), Assistant Professor

Ph.D., Atmospheric and Oceanic Sciences, Princeton University

Areas: Climate dynamics, tropical meteorology, Seasonal climate prediction, Impact of climate change, Statistical and dynamical downscaling

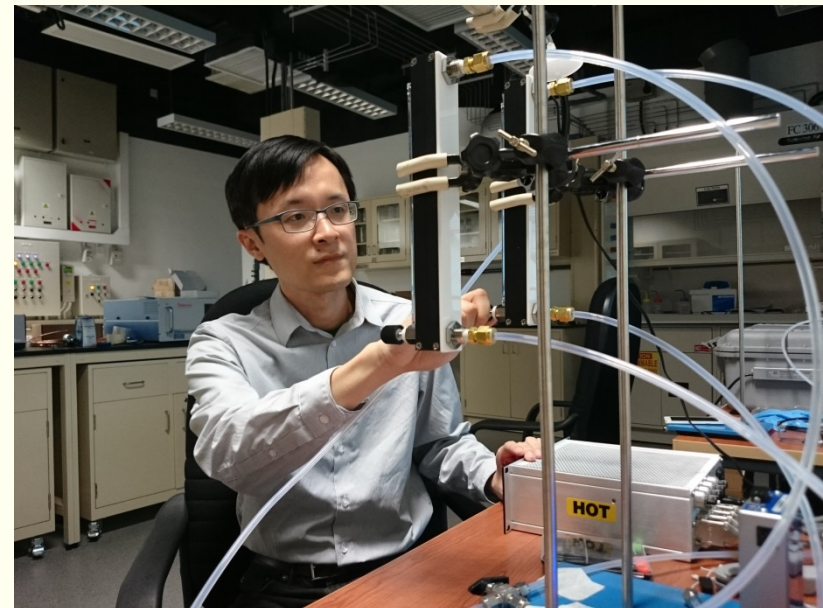
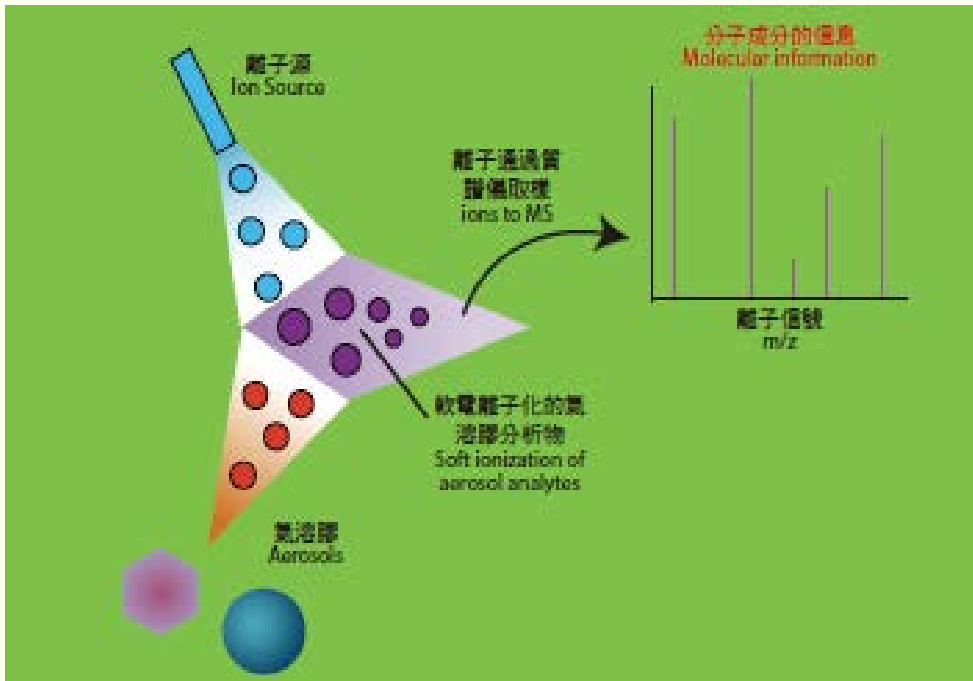
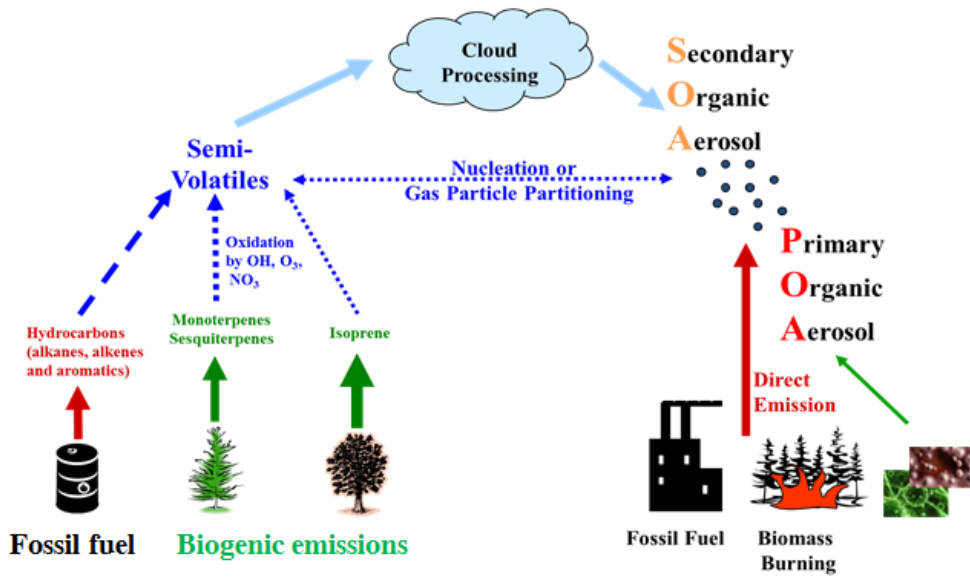


Andie Y.M. Au-Yeung (歐陽綺雯), Assistant Lecturer

Ph.D., City University of Hong Kong

Areas: tropical meteorology, seasonal climate prediction, tropical cyclone activities

陳文年教授主力研究大氣懸浮粒子的來源、其形成方式和化學成份，並探究浮質結構的改變。他的實驗室除了運用不同的光譜技術來分析氣溶膠的成份外，也會利用科學分析技術去即時偵測它們的成份。簡單來說，就是先把氣溶膠轉化為氣態，經離子化後就可以分析它的成份。知道氣溶膠的成份後就可以對症下藥，作針對性的減排了！



戴沛權獲世界氣象組織青研獎

香港文匯報訊（記者 歐陽文倩）中文大學地球系統科學課程助理教授戴沛權昨日獲頒發聯合國2015年度「世界氣象組織青年科學家研究獎」，是香港首位奪得這個獎項的科學家。他獲獎的研究題目為「暖化問題及空氣污染的結合嚴重威脅全球糧食安全」，有關研究結果曾於《自然—氣候變化》期刊發表。

研測暖化令農作物在2050年前減產逾10%

戴沛權獲獎的研究預測，在2050年前，氣候暖化將令全球農作物的生產量減少逾10%，再加上空氣污染的問題，農作物產量將進一步降低，或會令發展中國家的營養不足率增加約50%。不過，嚴格管制空氣污染，可部分抵銷氣候暖化對農作物的影響。他的研究揭示，氣候變化及空氣污染的相互作用嚴重威脅全球農作物生產量，建議政策制定者在解決全球糧食危機時，須將這兩種因素一併考慮。

負責頒獎的香港天文台台長及世界氣象組織中國香港常駐代表岑智明表示，戴沛權是次獲獎是香港氣象界的光榮，大讚其研究對大眾有提醒作用，亦讓政策決定者可取得以科學為基礎的氣候資訊，以制訂措施。

戴沛權亦對是次獲獎感到榮幸，並感謝其研究團隊和合作夥伴一直以來的努力和支持，以及香港天文台提名他參加是次獎項，「我和我的研究團隊會繼續研究全球環境改變所帶來的後果，讓政策決定者能為我們的可持續發展未來制訂最適合的策略。」



Tackling Food Security

A Hong Kong academic's environmental impact study on global food supply has garnered international kudos.

10 September 2015



Director of the Observatory presented the Research Award for Young Scientists 2015 on behalf of the World Meteorological Organization

Tuesday, 1st September 2015

Professor Amos Tai
Earth System
Science Programme

Hong Kong has been recognised for its work on global food security with Professor Amos PK Tai being awarded the United Nations' World Meteorological Organization Research Award for Young Scientists 2015. Professor Tai, of the Earth System Science Programme at the Chinese University of Hong Kong (CUHK), is the first Hong Kong scientist to win the prestigious award. It was presented in recognition of a scientific paper entitled "Threat to future global food security from climate change and ozone air pollution," which Professor Tai published in the *Journal of Nature Climate Change*.

中大研城市化氣候變化影響 冀聯天文台「狙擊」極端天氣
暴雨增密 港變澤港

編按：氣候變化是本世紀人類面臨的最大挑戰。化石燃料的使用令溫室氣體過度排放，加上森林遭破壞，打破了氣候的微妙平衡，可能對人類和環境帶來災難性衝擊。各國領袖明日起將齊聚法國巴黎，舉行聯合國氣候變化峰會，希望能定下減排目標，緩和氣候的不尋常變化。此次峰會受到高度重視，事實上面對全球性氣候問題，香港不可能獨善其身，為此本港科研人員積極投入，以科學的力量走上面對氣候變化的前線。本報今日起推出系列報道，從極端天氣、生態環境、海平面上升和監察警示等方面，讓香港科學家以其第一手的研究資料，與讀者一同分析探究氣候變化對香港以至鄰近地區的影響，期望喚起大眾更廣泛關注。



Professor Francis Tam
Earth System Science Programme

八成內容涉數理
着重書寫溝通

中大地球系統科學 聯招首次獨立收生

全球暖化、空氣污染等問題日益加劇，嚴重影響市民的生活質素，分析問題背後的原因和尋找解決方法變得刻不容緩。中文大學理學院在新學制開始初期，已開辦地球系統科學課程，但一直採用學院制大類收生，新學年才首次推出課程獨立收生。課程主任黃庭芳接受訪問時表示，有別於地理與資源管理學，課程有八成內容涉及數理，因此學生必須具備良好數理基礎，他們亦會在一年級完結前選擇主修「大氣科學」或「地球物理」。

記者黃曼芳

近年社會對環境問題的關注有明顯提升，除了關注教育學生外，了解和分析問題背後的原因亦相當重要。中大理學院地球系統科學課程主任黃庭芳表示，四年制的課程主要圍繞地質學、氣象學、海洋學及生物學等跨學科內容，並強調「數理化」的

重要。「八成的課程涉及數理，與理學院其他課程並無不大。」

不過，除了數學及統計學知識外，黃庭芳稱，課程同時注重學生的書寫及溝通能力，因此學生的基本人學要求不止「三四三二二」，而是「三四四二二」，即是英文及數學科至少要達第四級，中文及地統則分別第三級和第二級；學生亦要在兩科理應修科目中，取得第四級及第三級成績，科目更與理科、地理或統計數學有關。

一年級學期末須選主修

整個課程的主修部分有七十二個學分，「學生可於一年級下學期完結前，選擇主修大氣科學或地球物理。」至於被问到畢業生的出路，黃庭芳笑言，不少家長和學生最先聯想到的工作是香港天文台，「其實除了天文台，畢業生亦合資格在與天氣風險管理有關的機構、如環境保護署、香港海關等工作，亦可從事環境評估顧問，或相關研究工作。」

有興趣報讀的學生，他們須於文憑試放榜後接受面試。地球系統科學課程助理教授譚志貴表示，不止數理中發關切環境，具備其他專長的學生外，亦希望



中大理學院地球系統科學課程主任黃庭芳(左)表示，課程有八成內容涉及數理，學生須具備良好數理基礎。

黃庭芳稱，在面試中觀察他們的溝通能力，「表達自己的思想和想法很重要，因為課程有不少需要團隊合作的功課，要求學生能整合所學知識。」黃庭芳補充稱，學院大類收生途徑仍然保留，預計每年取錄十人，而直接從課程入學的約二十人。



EARTH SYSTEM SCIENCE PROGRAMME
地球系統科學課程

學生將擁有深厚的科學及數理基礎，並對地球系統有深入的認識，而且掌握有關綜合分析及電腦的技能。

畢業生的出路廣泛：

- 繼續進修地球系統科學或其他相關科學，投身教育及科研
- 災害風險管理，需要具備資料搜集分析、資訊科技及影像處理等技能的工作
- 氣候、天氣及環境的專業和服務，如天文台、政府、私營環保機關及環境評估顧問等
- 石油、礦產、天然氣等天然能源的勘探與開發
- 岩土工程及流體物理廣泛應用於房屋、市政、水利、氣象、航運交通、國防等行業

Summary

2016 applicants can now join this new and unique programme via two different paths.

Earth System Science (ESSC) @ CUHK

❖ JUPAS 4633 *Earth System Science Programme.*

- ✓ In this accelerated scheme, you enter directly into the ESSC programme.
- ✓ You are expected to declare a stream (either Atmospheric Science or Geophysics) before end of Year 1.

❖ JUPAS 4601 *CUHK Science Broad-based Admission Scheme .*

- ✓ In this JUPAS scheme, you can select and declare to be an ESSC major no later than end of Year 2.

Admission Requirements for JUPAS Applicants - 2017 Entry

JS4601 Science Broad-based Admission Scheme

JUPAS Code	Programme/ Stream	Specific Requirements					Additional Remarks	Note	
		Core Subjects				Elective Subjects			
		English	Chinese	Maths	Liberal Studies	Elective Subject 1			Elective Subject 2 or M1/M2
JS4601	Science - Biochemistry - Biology - Cell and Molecular Biology - Chemistry - Earth System Science - Environmental Science - Food and Nutritional Sciences - Mathematics - Molecular Biotechnology - Physics - Statistics	3	3	2	2	One of the following subjects: - Mathematics (Module 1 or 2) - Biology - Chemistry - Physics - Combined Science - Integrated Science	3 ^{(a)(b)}	(a) Category A subjects only (b) Preferred subjects: - Mathematics (Module 1 or 2) - Biology - Chemistry - Physics - Combined Science - Integrated Science - Economics - Geography - Information and Communication Technology - Technology and Living (Food Science & Technology)	

JS4633

**Earth System Science Programme
(Atmospheric Science/Geophysics)**

Entry Requirement

4C+2X OR 4C+1X+M1/M2

Specific Requirements						Other Additional Requirement/ Remarks
Core Subjects				Elective Subjects		
English	Chinese	Maths	Liberal Studies	Elective Subject 1*	Elective Subject 2#	
4	3	4	2	4	3	Bonus points would be offered to the 3rd elective subject in Category A.

* One of the following subjects: Physics, Mathematics (Module 1 or 2), Chemistry, Geography, Combined Science

One of the following subjects: Physics, Mathematics (Module 1 or 2), Chemistry, Geography, Combined Science, Integrated Science, Biology

Admission Statistics (2016 Entry)

Median Admission Score 5.1000

Median of Best 5 Score 26

Admission Grades

Subject	ENG	CHI	MATH	LS	M1/M2	Best Elective	2nd Elective	3rd Elective
Upper Quartile	4	5	5*	4	5*	5*	5	
Median	4	5*	5	5		5**	5	4

JS4633

Earth System Science Programme (Atmospheric Science/Geophysics)

Subjects	Minimum Scores
English Mathematics Elective Subject 1	Level 4
Chinese Elective Subject 2	Level 3
Liberal Studies	Level 2

*Students can have an early
start in taking ESSC courses!*

ESSC Student

JS4601

Science Broad-based Admission Scheme

MAJOR DECLARATION

Science students can declare ESSC as a Major at any of the following three time points, provided that they meet the stated requirements.

Time	Requirements
Beginning of Year 1 (Entry)	Level 5 or above in Biology or Chemistry or Physics or Combined Science
End of Year 1	Grade C+ or above in CHEM1070 or LSCI1002 or MATH1010 or PHYS1111 or STAT1011
End of Year 2	Have taken (but not necessarily passed) (1) ESSC2010, ESSC2020, and (2) Any ONE course from CHEM1070 / LSCI1002 / MATH1010 / PHYS1111 / STAT1011

JS4633
Earth System Science Programme
(Atmospheric Science/Geophysics)

Streams	Atmospheric Science	Geophysics
Required Courses	<ul style="list-style-type: none"> • Atmospheric Dynamics • Atmospheric Chemistry • Ocean and Climate 	<ul style="list-style-type: none"> • Physics of the Earth • Structural Geology
Core Electives	<ul style="list-style-type: none"> • Hydrogeology • Understanding Our Biosphere • Global Environmental Change 	
Other Electives	<ul style="list-style-type: none"> • Tropical Meteorology • Physics and Chemistry of Aerosol • Air Pollution Science and Engineering • Land-Atmosphere Interactions and Boundary Layer Meteorology <p style="text-align: right;"><i>and more...</i></p>	<ul style="list-style-type: none"> • Engineering Geology Petrology • Geomorphology • Seismology • Marine Geology and Geophysics • Geoscience Field Courses <p style="text-align: right;"><i>and more...</i></p>

- **JS4633 students must declare one of the streams.**
- **JS4601 students can declare stream, but it is not compulsory to do so.**

地球系統科學 Earth System Science

Admission Scholarships

No. of HKDSE Subjects with Level 5**	Scholarships by the University	Scholarships by the ESSC Programme
6	Full-Tuition of \$42,100 (renewable) AND Exchange Scholarship of up to HK\$80,000	\$25,000 (one-off)
5	Half-Tuition of \$21,050 (renewable)	\$25,000 (one-off)
4	Half-Tuition of \$21,050 (one-off)	\$25,000 (one-off)
3	\$10,000 (one-off)	\$10,000 (one-off)
2	---	\$5,000 (one-off)

The University and Colleges also offer admission scholarships for outstanding students.

大學及書院亦會為成績優異的學生提供入學獎學金。

Admission Requirements for non-JUPAS Applicants

Programme: GCE AL / GCE AS / IAL

ESSC(AS/GEO) 3AL or 2AL+2AS in one sitting AND At least 2 AL subjects (including PHYS, MATH, Fur MATH, CHEM, GEOG)

Programme: IB

ESSC(AS/GEO) 2 HL science subjects (including PHYS, MATH, Further MATH, CHEM, GEOG)

Programme: SAT / AP

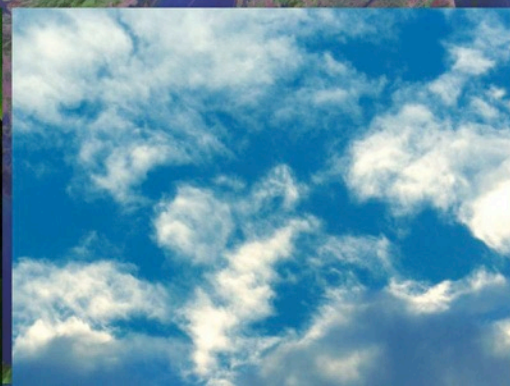
ESSC(AS/GEO) SAT Reasoning Test + 2 SAT Subject Test (including PHYS, MATH Level I or II, CHEM), or SAT Reasoning Test + 2 AP subjects (including PHYS 1 or 2, Calculus AB or BC, CHEM)



地球系統科學

EARTH SYSTEM

SCIENCE PROGRAMME



Earth System Science Programme

地球系統科學課程

Tel: 3943 9624

Fax: 3942 0970

Email: essc@cuhk.edu.hk

香港中文大學理學院
Faculty of Science, CUHK