The Chinese University of Hong Kong
Faculty of Science
Science Academy for Young Talent

Summer Courses 2023
Course Outline

CUSA1045 Discovering the Universe
探索宇宙

Introduction: Humans want to explore the universe by looking up into the sky since ancient times. This course offers the outline about the selected phenomena which were observable with the naked eye. Upon finishing the course, students will acquire the development of modern astronomy, knowledge of the basic observational features of the sky, and the application of physical principles to astronomy.

The course includes lectures, experiments, and observation sessions. The experiments session is aimed to provide students with hand-on experience in basic physical principles and ideas in Astronomy. Student will have indoor observation of simulated night in class. Outdoor solar observation will be held if weather permits.

人類自古以來已希望通過觀察天文現象來探索身處的宇宙。本課程的設計正旨在概述這些肉眼能見的天象。完成課程的學生會了解當代天文的發展、有關天象的基本知識，以及物理定律在天文學上的應用。

本課程分為講座、實驗，和天文觀察三部份。實驗部份的目的是讓學生有機會親身驗證認識基本科學原理和天文概念。學生在天文觀察部份，可以參與模擬星空觀察。若天氣許可，學生會於室外作太陽的觀察。

Medium of Instruction: Cantonese supplemented with English
粵語輔以英語

Organising Unit: Department of Physics, Faculty of Science, CUHK

Teachers:

Dr. LEUNG Po Kin (梁寶建博士)
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Demonstrators: Students from Department of Physics, CUHK

Course Content:

28 August 2023 (Monday) 9:00 am – 1:00 pm 2:00 pm – 5:00 pm	**Lecture 講課: (3 hrs)** • Introduction to Astronomy 天文學簡介 • Ancient Greek Astronomy (Plato, Aristotle) 古希臘天文（柏拉圖、阿里士多德） • Modern Astronomy (Copernicus, Kepler, Newton) 現代天文(哥白尼、開普勒、伽利略、牛頓) • Newton's laws of motion and law of gravitation 牛頓運動定律和重力定律 • Basics concepts of celestial sphere 天球介紹 **Assessment 評核:** MC, short questions, etc 選擇題、短題目…… **Lab 實驗: (3 hrs)** • Newtonian mechanics (Measuring gravitational acceleration; If time permits, also verifying Newton's second law.) 牛頓力學 (例如：量度地心引力加速、確認牛頓運動定律) **Assessment 評核:** Lab report 實驗報告 **Observation 天文觀察: (1 hr)** Indoor simulated night sky observation 室內模擬星空觀察
29 August 2023 (Tuesday) 9:00 am – 1:00 pm 2:00 pm – 5:00 pm	**Lecture 講課: (3 hrs)** • Constellations 星座、Seasons 季節、The Moon 月球 (月相、潮汐、掩蝕) **Lecture 講課: (2 hrs)** • Overview of the Solar System 太陽系概覽 • Planets 行星、Dwarf planets and asteroids 矮行星和小行星、Comets 彗星、Meteors 流星 **Assessment 評核:** MC, short questions, etc 選擇題、短題目…… **Observation 天文觀察: (2 hrs)** (note: this session would be moved to the 3rd day in case of bad weather 若天氣欠佳，此部份將順延到第三天) • Basics related to observation 有關天文觀察的基本知識 • Physical principles behind telescope 望遠鏡的原理 • Outdoor solar observation (if weather permits) (如天氣許可) 室外太陽觀察
30 August 2023 (Wednesday) 9:00 am – 1:00 pm 2:00 pm – 5:00 pm	**Lecture 講課: (3 hrs)** • The Sun – the nearest star 太陽 – 最接近的恆星、Stars 恆星、Star light 星光 **Lab 實驗: (3 hrs)** • Light (e.g. observing the spectra of elements; verification of Bohr's model.) 光(例如：觀察原素光譜、確認玻爾模型) **Assessment 評核:** Lab report 實驗報告 **Lecture 講課: (1 hr)** • Conclusion 總結、Brief introduction to other fields in Astronomy 其他天文學範疇概覽 **Assessment 評核:** MC, short questions, etc 選擇題、短題目……
31 August 2023* (Thursday) 9:00 am – 1:00 pm 2:00 pm – 5:00 pm	Make-up Class

Duration	3 whole day sessions (total 21 contact hours)
Date	28 – 30 August 2023 31 August 2023* (make-up class)
Time	9:00 am – 1:00 pm & 2:00 pm – 5:00 pm
Teaching Mode	Face to Face (The Chinese University of Hong Kong)
Enrollment	20 – 30
Expected Applicants	Students who are promoting to or studying S4 – S6
Tuition Fee	HKD 3,560.00
Credit	1.5 Academy Unit Certificate of completion will be awarded to students who pass the assessment (if applicable) and attain at least 75% attendance.
Grading Methods	Pass or Fail

** This date is reserved for make-up classes in case there is any cancellation of classes due to unexpected circumstances.*