



Online Mathematics Lectures

The Department of Mathematics of CUHK invites you to join us in March and April 2022 to discover more about the beauty and elegance of mathematics.

The 1-hour online talks will be conducted via Zoom.
All are welcome.



Online Registration

Saturdays 11:00 - 12:00

12/3	Geometry from string theory Prof. Chan Kwok Wai	19/3	Coding Theory and Algebra Dr. Chan Kai Leung
2/4	Soap bubbles in geometry and physics Prof. Martin Li Man Chun	9/4 (updated)	The Unknowable in Mathematics Prof. Michael McBreen
16/4 (Updated)	Magic squares Dr. Charles Li Chun Che	23/4	Descartes, Euler - the two men that connected classical Geometry to modern Differential Geometry Dr. Cheung Leung Fu

Date: 12 Mar, 2022 (Sat)


Time: 11:00-12:00

Speaker: Prof. Chan Kwok Wai

Title: Geometry from string theory

Abstract: String Theory unifies General Relativity and Quantum Mechanics -- the two most important but contradictory theories of 20th century physics. As such, String Theory becomes a candidate for a Theory of Everything (TOE). Besides its importance in physics, string theory has also led to very exciting and surprising developments in mathematics. In this talk, we will try to explain some of the craziest ideas and predictions in String Theory, from the point of view of geometry.

Language: Cantonese



Date: 19 Mar 2022 (Sat)
Time: 11:00-12:00
Speaker: Dr. Chan Kai Leung

Title: Coding Theory and Algebra

Abstract: From storage of information in a DVD, satellite broadcasting of high-definition television, to sending pictures back to the Earth from spacecraft, it is unavoidably influenced by noise or corruption. Improving the reliability of these procedures relies on the techniques for error detection and corrections, which is one of the main purposes of studying coding theory. In this talk, we will explore how mathematics, in particular abstract algebra, can help in the development of coding theory.

Language: Cantonese

Date: 2 Apr, 2022 (Sat)
Time: 11:00-12:00
Speaker: Prof. Martin Li Man Chun

Title: Soap bubbles in geometry and physics

Abstract: Every kid must have played with soap bubbles in the childhood. Have you ever thought about why soap bubbles appear roughly as a spherical shape? Behind these beautiful bubbles lie some of the most interesting geometric and physical phenomena. How are these soap bubbles related to black holes, a mysterious class of objects in our universe? In this talk, we will explore the mathematics of soap bubbles and its intriguing connection with Einstein's theory of relativity.

Language: Cantonese

Date: 9 Apr, 2022 (Sat)
Time: 11:00-12:00
Speaker: Prof. Michael McBreen

Title: The Unknowable in Mathematics

Abstract: We often think of mathematics as the art of knowing things exactly. But mathematics can also show us the limits of human knowledge. What does it mean to say something is unknowable? Are there mathematical questions which simply do not have an answer? I'll tell the story of a few surprising such unknowns and unknowables, starting in ancient Greece and ending in the present.

Language: English



Date: 16 Apr, 2022 (Sat)

Time: 11:00-12:00

Speaker: Dr. Charles Li Chun Che

Title: Magic squares

Abstract: A magic square is an n by n square with numbers, such that the sum of rows, columns and the diagonals are the same. In this talk, we will discuss the mathematical theory of magic squares and how magic squares are related to other mathematical puzzles, including Latin squares, Euler's 36 officer problem, eight queens Puzzle and Knight's tour.

Language: Cantonese

Date: 23 Apr, 2022 (Sat)

Time: 10:00-11:00

Speaker: Dr. Cheung Leung Fu

Title: Descartes, Euler - the two men that connected classical Geometry to modern Differential Geometry

Abstract: We will first talk about two simple formulas invented by Euler and Descartes (in that order!), i.e. $V-E+F=2$ and $V-E+F = \text{sum of angle defects}$.

Then we will go to an in-depth analysis of Euler's formula in terms of its connection to philosophy of mathematics (as explained in the doctoral thesis of Imre Lakatos) and topology, together with the winding path which led to numerous fine tuning of the formula in the past three hundred years. Finally, we will briefly mention how this formula is related to Descartes wonder formula and how this, in turn, is related to a very deep result in differential geometry, which is even present in Stephen Hawking's proof of his famous theorem.

We will also try to discuss the oft mentioned folklore, that Descartes was the inventor of Cartesian coordinates. We will look at it from his own works to see the facts behind this "traditional wisdom".

Language: Cantonese