

2026 年 数学・数理科学グローバル講義Ⅱ（後期）

注）タイトルとアブストラクトが未定のものとは分かり次第掲載します。

数学・数理科学グローバル特別講義 5

講師：Umut Varolgunes（Koç University、幾何学分野）

講義日程：2026 年 9 月 28 日（月）～10 月 2 日（金） 各日 10:00–12:00

タイトル：Fukaya category with support

概要：

I will explain the construction of Fukaya categories with support on compact subsets of a symplectic manifold. I will discuss the issues of descent, locality and local generation. Then, I will move on to applications in homological mirror symmetry and sheaf quantization. The lectures will start with a brief reminder on Lagrangian Floer theory.

数学・数理科学グローバル特別講義 6

講師：Matthias Hieber（Technische Universität Darmstadt、PDE 学分野）

講義日程：10 月 29 日（木）30 日（金）

11 月 4 日（水）、5 日（木）、6 日（金） 各 13:15 – 15:30

タイトル：Nonlinear PDEs in Fluid Dynamics: An Approach by Maximal Regularity

概要：

The field of Nonlinear PDEs in Fluid Dynamics has seen very many scientific activities in the last years, which are due to the facts that the underlying governing equations have a very complex structure and, on the other hand, that these equations form a building block for other disciplines in science.

These lectures will investigate current questions on the theory of the Navier-Stokes equations and on geophysical flows, on deterministic and stochastic models of complex fluids and on moving or free boundary problems.

In particular, topics include: regularity theory of semi - and quasi linear parabolic equations, properties of the Stokes operator, regularity theory of Navier-Stokes equations, atmosphere-ocean models, liquid crystals, poro- and viscoelastic fluids as well as free boundary problems.

数学・数理科学グローバル特別講義 7

講師: Kwokwai Chan (The Chinese University of Hong Kong, 幾何学分野)

講義日程: 12 月 17 日(木)、18 日(金)、21 日(月)、22 日(火)、23 日(水) 各 10:00 - 12:00

タイトル: Deformation theory, tropical geometry and Fukaya's proposal on the SYZ conjecture

概要:

The famous Strominger-Yau-Zaslow (SYZ) conjecture provides a geometric framework to understand mirror symmetry. It asserts that a Calabi-Yau manifold and its mirror both admit (special) Lagrangian torus fibrations to the same base. In 2002, Fukaya laid out a detailed program explaining how the symplectic geometry (A-model) of a Calabi-Yau manifold can be related to the complex geometry (B-model) of its mirror via (multi-valued) Morse theory on the base manifold. In this lecture series, we will explain a reformulation of Fukaya's picture, replacing Morse theory on the base by tropical geometry on its Legendre dual. We will also prove some of his conjectures. Along the way, we would see how asymptotic analysis on the Maurer-Cartan equation in the deformation theory of a Calabi-Yau manifold can give rise to tropical objects such as scattering diagrams and counts of tropical curves. This lecture series is based on a series of joint works with Conan Leung and Ziming Nikolas Ma and others, which were substantially supported by Hong Kong RGC grants.