

复几何与Kähler几何: Complex Analytic and Differential Geometry

(preliminary) Monday (6,7,8,9) 14:00–15:35 15:55–17:30

Room 5307

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This course will cover differential geometry on complex manifolds, and more generally complex analytic geometry, with an emphasis on analytic techniques such as currents and plurisubharmonic functions. We will first spend some time on the basics of several complex variables and pluripotential theory: subharmonic functions, plurisubharmonic functions, currents, and Monge-Ampère operators. Then we will cover the basics of complex analytic varieties, and consider topics such as Stein spaces and vanishing theorems.

These techniques of pluripotential theory have been essential in recent research on complex manifolds, such as recent developments on the Yau-Tian-Donaldson conjecture on the existence of constant scalar curvature metrics on Kähler manifolds.

The prerequisites are some knowledge of manifolds and differential geometry. It will help to have some knowledge of complex manifolds.

Grading:

I will give some exercises which will be the basis for your grade. I will post problems and announcements on the above web page.

Text:

- Jean-Pierre Demailly, Complex Analytic and Differential Geometry, e-book, <https://www-fourier.ujf-grenoble.fr/~demailly/manuscripts/agbook.pdf>.

The following is another good reference.

- Griffiths, P. and Harris, J., Principles of Algebraic Geometry, Wiley, New York, 1978.