

Topics in Complex Geometry

2025 Spring NTU course by Chin-Lung Wang

Final report projects:

Riemann Surfaces

1. Runge approximation, uniformization and triviality of vector bundles [F, Ch-3]

Quasi-conformal Mappings

2. Higher dimensional extension of Mori's theorem on K-q.c. maps [FV 1988]
3. Calderon—Zygmund inequality and parameter dependence [A, Ch-V, C+D]
4. Alternative proof of Teichmuller theorem via changing charts [ACG, Ch-XV]

Complex Manifolds

5. Formality of compact Kaehler manifolds and supersymmetry [H, 3.A-B]
6. Kodaira vanishing and Kodaira embeddings [H, 5.2-5.3] or [D, Ch-VII]

L^2 Methods

7. Hormander's L^2 estimate and Ohsawa—Takegoshi extension [D, Ch-VIII, S6-7]
8. Proof of Newlander—Nirenberg theorem [D, Ch-VIII, S11]

Deformation Theory

9. Bogomolov—Tian—Todorov theorem and its extension to dGBV categories [H, 6.1-A]
10. T^1 -lifting methods for unobstructed deformations [Kawamata 1992]

Your Favorite Project

You may also discuss with me on your preferred project in case it is not listed above.