



# FMSP Lectures

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## "Singular hermitian metrics and morphisms to abelian varieties"

July 18(Wed), 20(Fri), 23(Mon), 24(Tue), 25(Wed),  
10:15 ~ 12:15 Room 118

### Abstract:

Consider a morphism from a smooth projective variety to an abelian variety (over the field of complex numbers). After reviewing what is known about the pushforward of the canonical bundle under such a morphism, we will try to extend these results to the case of pluricanonical bundles (= the tensor powers of the canonical bundle). Along the way, we will learn about three important tools: generic vanishing theory; Viehweg's cyclic covering trick; and some new results from complex analysis about metrics with singularities. As an application, we will discuss the proof of Iitaka's conjecture (about the subadditivity of the Kodaira dimension in algebraic fiber spaces) over abelian varieties, following Cao and Paun.

### References:

1. Junyan Cao and Mihai Paun, "Kodaira dimension of algebraic fiber spaces over abelian varieties", *Invent. Math.* 207 (2017), no. 1, 345-387
2. Christopher Hacon, Mihnea Popa, and Christian Schnell, "Algebraic fiber spaces over abelian varieties: around a recent theorem by Cao and Paun", arXiv:1611.08768
3. Christian Schnell, "Lectures on the generic vanishing theorem and its applications", <http://www.math.stonybrook.edu/~cschnell/pdf/notes/generic-vanishing.pdf>
4. Mihai Paun, "Singular hermitian metrics and positivity of direct images of pluricanonical bundles", arXiv:1606.00174

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