

## Algebraic Geometry Seminar

### *Vanishing theorems in equal characteristic zero*

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**Abstract:** In 1953, Kodaira proved what is now called the Kodaira vanishing theorem, which states that if  $L$  is an ample divisor on a complex projective manifold  $X$ , then  $H^i(X, L) = 0$  for all  $i < \dim(X)$ . Since then, Kodaira's theorem and its generalizations due to Grauert–Riemenschneider, Kawamata–Viehweg, Kollár, and others have become indispensable tools in algebraic geometry over fields of characteristic zero, in particular in birational geometry and the minimal model program. Even in this context, however, it is often necessary to work with schemes that are not of finite type over fields, and a fundamental problem in this more general context has been the lack of Kodaira-type vanishing theorems. We prove generalizations of Kodaira's vanishing theorem for proper morphisms of schemes of equal characteristic zero in arbitrary dimension, answering questions of Boutot, Kollár, and Kawakita. These results are optimal given known counterexamples to these vanishing theorems in positive and mixed characteristic.

Monday, October 25 at 3:00 PM in Zoom