

## Algebraic Geometry Seminar

### *Hodge theory and o-minimal geometry*

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**Abstract:** Hodge structures on cohomology groups are fundamental invariants of algebraic varieties; they are parametrized by quotients  $D/\Gamma$  of periods domains by arithmetic groups. Except for a few very special cases, such quotients are never algebraic varieties, and this leads to many difficulties in the general theory. We explain how to partially remedy this situation by equipping  $D/\Gamma$  with an o-minimal structure, and show that period maps are "definable" with respect to this structure. As a consequence, we obtain an easy proof of a result of Cattani–Deligne–Kaplan on the algebraicity of Hodge loci, a strong piece of evidence for the Hodge conjecture. The proof of the main theorem relies heavily on work of Schmid, Kashiwara, and Cattani–Kaplan–Schmid on the asymptotics of degenerations of Hodge structures. This is joint work with B. Klingler and J. Tsimerman.

Wednesday, April 25 at 5:00 PM in SEO 427