

## The seventh Takagi Lectures

November 21, 2009 (Sat) 13:30–14:30

November 22, 2009 (Sun) 14:30–15:30

Graduate School of Mathematical Sciences

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# Weights in arithmetic geometry

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## Abstract

The concept of weights on the cohomology of algebraic varieties was initiated by fundamental ideas and work of A. Grothendieck and Pierre Deligne. It is deeply connected with the concept of motives and appeared first on the singular cohomology as the weights of (possibly mixed) Hodge structures and on the étale cohomology as the weights of eigenvalues of Frobenius. But weights also appear on algebraic fundamental groups and in  $p$ -adic Hodge theory, where they become only visible after applying the comparison functors of Fontaine. After rehearsing various versions of weights, the talk will present some more recent applications of weights, e.g., to Hasse principles and the computation of motivic cohomology, and will discuss some open questions and speculations.