Abstract:

About 30 years ago Drinfeld introduced his p-adic symmetric domain of dimension d, denoted here X, which is an analytic space over the field of p-adic numbers, on which

$$G = GL_{d+1}(Q_p)$$

acts. Its quotients X_Γ by discrete and cocompact subgroups $\Gamma < G$ are (the analytic spaces associated to) smooth projective varieties. Among these p-adically uniformized varieties lie some important Shimura varieties.

There is a "reduction" map from X to T, the Bruhat-Tits building of G. Using it, harmonic analysis on T, and ideas coming from the combinatorics of hyperplane arrangements, we describe the cohomology of X and of X_Γ in terms of harmonic cochains on T (extending work begun by Schneider and Stuhler in 1991). Applications to the cohomolgy of X_Γ, include a Hodge-like decomposition of the cohomology, and a proof of the Monodromy-Weight conjecture for this class of varieties.

In most of the talk, we shall only assume standard background in algebraic geometry amd familiarity with the p-adic numbers. All of the concepts mentioned above will be defined!