Math 209 - Number Theory

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Rigidity and Riemann-Hilbert correspondence for de Rham local systems

Abstract:
We construct a functor from the category of $p$-adic local systems on a smooth rigid analytic variety $X$ over a $p$-adic field to the category of vector bundles with a connection on $X$, which can be regarded as a first step towards the sought-after $p$-adic Riemann-Hilbert correspondence. As a consequence, we obtain the following rigidity theorem for $p$-adic local systems on a connected rigid analytic variety: if the stalk of such a local system at one point, regarded as a $p$-adic Galois representation, is de Rham in the sense of Fontaine, then the stalk at every point is de Rham. Along the way, we also establish some results about the $p$-adic Simpson correspondence. Finally, we give an application of our results to Shimura varieties. Joint work with Xinwen Zhu.

Special Note:
The speaker will give a prep talk for graduate students in AP&M 7421 at 1:15 pm. All graduate students interested in number theory are strongly encouraged to attend.