Title: Buildings, WKB analysis, and spectral networks

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Abstract: Buildings are higher dimensional analogues of trees. The goal of these lectures is to explain how the theory of harmonic maps to buildings affords a new perspective on certain aspects of the WKB analysis of differential equations that depend on a small parameter. We will also touch upon some motivation for developing this perspective, which derives from questions about compactifications of higher TeichmÃ<sup>1</sup>/<sub>4</sub>ller spaces, stability in Fukaya categories, and the work of Gaiotto, Moore and Neitzke on spectral networks and wall-crossing phenomena. These talks are based on joint work with Ludmil Katzarkov, Alexander Noll and Carlos Simpson.

A central role in our discussion will be played by the notion of a versal pre-building associated with a given spectral cover of a Riemann surface. This notion generalizes to higher rank the leaf space of the foliation defined by a quadratic differential. We will see that spectral networks are closely related to the singular loci of versal buildings, and that distances in these buildings encode information about the asymptotic behavior at infinity of the Riemann-Hilbert correspondence.

















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