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*The Matching Problem in the Complex Plane*

The *matching problem* for a Jordan curve was first introduced by Ebenfelt, Khavinson, and Shapiro in the context of solving the Dirichlet problem using a double-layer potential. They demonstrated that the problem admits a solution when  $\Gamma$  is a rational lemniscate, but has no solution when  $\Gamma$  is the image of the unit circle under a rational map holomorphic in a neighborhood of the closed unit disk. Since then, little progress has been made on the matching problem.

In this talk, I will present a connection between the matching problem for a Jordan curve and the conformal welding of the curve. Leveraging this relationship, I will establish the existence of solutions to the matching problem for certain fractal-like curves. This answers a question posed by the original authors regarding the interplay between the regularity of the curve and the existence of solutions to the matching problem.

Joint work with Kirill Lazebnik and Malik Younsi.