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Can you hear the shape of a triangle?

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In this talk, we address the problem of identifying the shape of a triangular domain from three of its Dirichlet eigenvalues $\{\lambda_i, \lambda_j, \lambda_k\}$. It is known that the knowledge of the first three Dirichlet eigenvalues $\{\lambda_1, \lambda_2, \lambda_3\}$ is sufficient to determine a triangular domain up to rigid motions. On the other hand, not all triplets uniquely determine the shape of a triangular domain (a known example of such an “unhearable triplet” is given by $\{\lambda_1, \lambda_2, \lambda_2\}$). In this talk, we describe two that lead to unhearability and, as a byproduct, we provide an infinite family of unhearable triplets.

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