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Identity return triangles in laminations: the hunt for base leaves and their co-roots

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Abstract: This talk will be an introduction to the initial stages of ongoing research which strives, overall, to use laminations of the unit disk – a method pioneered by Thurston – to better understand complex polynomials and their dynamics. It is easily shown that a laminational phenomena deemed 'Identity Return Triangles' (IRTs) occurs as soon as the degree d of a polynomial satisfies $d \geq 3$. What is not known is how to generate them all for a given d (barring a brute-force approach). This talk will first introduce the idea of a 'base leaf' in a lamination and how such a leaf can be used to generate an IRT using points called 'co-roots'; it is conjectured that this method will also produce *all* IRTs, and thus we've reduced our search for IRTs to a search for base leaves and co-roots. We will then present the current work towards generating/recognizing/categorizing/etc. base leaves and co-roots, including some previous plausible-but-debunked ideas alongside current pathways being explored.