Identity Return Triangles in Laminations: The Hunt for Base Leaves and their Co-Roots

Thomas Sirna
University of Alabama at Birmingham
`tsirna@uab.edu`

After success in starting with a complex polynomial with a locally connected Julia set and constructing a lamination of the unit disc, one often starts con- structing and studying laminations — usually with specific features — on their own, putting off the possible realization by an actual polynomial until later. One phenomena, called 'Identity Return Triangles,' (IRTs) occurs as soon as the degree d of a polynomial satisfies $d \geq 3$. This talk presents a method of searching for IRTs by identifying and/or constructing certain periodic leaves, called Base Leaves, which admit connection with a third point, called a Co-Root, to form a periodic triangle. Each search is a separate but related problem. It is then proven that all IRTs can be found this way and further that each canonical lamination formed from an IRT is realized by an actual polynomial, assuring us that by studying these 'artificial' laminations we study Julia sets.