

Analysis Seminar Thursday October 18, 2018

Speaker: Meredith Sargent

Title: *Escaping nontangentiality: Towards a controlled tangential amortized Julia-Carathéodory theory*

Abstract: Let $f : D \rightarrow \Omega$ be a complex analytic function. The Julia quotient is given by the ratio between the distance of $f(z)$ to the boundary of Ω and the distance of z to the boundary of D . A classical Julia-Carathéodory type theorem states that if there is a sequence tending to τ in the boundary of D along which the Julia quotient is bounded, then the function f can be extended to τ such that f is nontangentially continuous and differentiable at τ and $f(\tau)$ is in the boundary of Ω . We develop an extended theory when D and Ω are taken to be the upper half plane which corresponds to amortized boundedness of the Julia quotient on sets of controlled tangential approach, so-called λ -Stolz regions, and higher order regularity, including but not limited to higher order differentiability, which we measure using γ -regularity. Applications are given, including perturbation theory and moment problems. This is joint work with J.E. Pascoe and R. Tully-Doyle.