Núria Fagella
University of Barcelona

Quasiconformal surgery and applications

This course consists of 4 lectures of 90 minutes. In the first two lectures we will give a gentle introduction to the technique of quasiconfromal surgery, and variations thereof. The third and fourth lectures will be devoted to applications. Starting from some classical ones, we will also present others not so well known or even new, like gluing infinite sequences of hyperbolic Blaschke products into wandering domains of transcendental maps.

Tentative plan:

1. Introduction to surgery

   - Quasiconformal maps. Almost complex structures and pullbacks. The Measurable Riemann mapping theorem and extensions (David maps). Extension results (a brief account)

   - Surgery. Constructing dynamical models. Soft surgery (quasiconformal deformations). Cut and paste surgeries. An example: the Straightening Theorem. Trans-quasiconformal surgery. Non-dynamical surgery

   - General principles of surgery: Shishikura's principles. Sullivan's straightenning principle

2. Applications (tentative list of choices)

   - Changing the multiplier: parametrization of hyperbolic components (Douady-Hubbard, Sullivan)

   - Ghys surgery: Herman rings and Siegel disks

   - Wandering domains with eventual connectivity 2 (Kisaka-Shishikura)

   - Adding an essential singularity - Transcedentalization. (Peters-F)

   - Gluing along the ideal boundary: gluing rigid Fatou components (McMullen)

   - Simultaneous Uniformization of Blaschke products (McMullen)

   - Wandering domains with prescribed (hyperbolic) inner functions (Evdoridou-F-Geyer-Pardo)