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Aula Petita (CRM).

Analytic capacity and rational Ahlfors functions

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ABSTRACT: Let K be a compact subset of $\mathbb{C}$ and let X be the complement of K in the Riemann sphere. The *analytic capacity of K* is

$$\gamma(K) := \sup\{|f'(\infty)| : f \in \mathcal{O}(X, \overline{\mathbb{D}})\},$$

where $\mathcal{O}(X, Y)$ denotes the set of holomorphic maps from X to Y, and

$$f'(\infty) := \lim_{z \to \infty} z(f(z) - f(\infty)).$$

Analytic capacity of compact plane sets was first introduced by Ahlfors in order to study Painlevé's problem of finding a geometric characterization of the compact sets that are removable for bounded holomorphic functions.

It is well-known that if $\gamma(K) > 0$, there is a unique extremal function f with $f'(\infty) = \gamma(K)$, called the *Ahlfors function on X* or *for K*.

In this talk, I will present some new results obtained in connection with a problem raised by Jeong and Taniguchi in [1], asking to find all rational maps R of degree n such that $R^{-1}(\mathbb{D})$ is a domain bounded by n disjoint analytic curves and R is the Ahlfors function on $R^{-1}(\mathbb{D})$. This is joint work with Maxime Fortier Bourque.

References

[1] M. Jeong and M. Taniguchi, Bell representations of finitely connected planar domains, *Proc. Amer. Math. Soc.* **131** (2003), 2325–2328.