Analysis Seminar

Title: Examples of Universal Dirichlet series

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Date: Mon 22nd April 2024 at 3:00PM

Location: To be announced

Abstract: Universality refers to the phenomenon where an object, via a countable process, yields approximations to all members of some collection of interest.

In our case this object will be a Dirichlet series of the form $\sum_n a_n e^{-s\lambda_n}$ and the approximation will happen via vertical translations.

In 1975 Voronin proved that the Riemann zeta function, $\zeta(s) = \sum_{n \geq 1} n^{-s}$, $\Re s > 1$ is universal in the critical strip $\{\frac{1}{2} < \Re s < 1\}$. After the seminal work of Voronin on the Riemann zeta function a lot of authors studied Dirichlet series in terms of their universal properties.

The aim of this talk is to give **examples of convergent universal objects** such as the alternating prime zeta function $P(s) = \sum (-1)^n p_n^{-s}$ on the critical strip.

Essentially, we are going to prove that for every compact subset with connected complement K of Ω, the vertical translations of the form $P(\cdot + it)$ can approximate uniformly in K every function f, which is continuous on K and holomorphic in the interior.

This is joint work with Frédéric Bayart.

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