

Complex uniformization of Fermat curves

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The ground-breaking research on the uniformization of complex algebraic curves was conducted in the early decades of the 19th century. Nevertheless, there are few examples in the literature of algebraic curves for which an explicit uniformization is known. Prototypes are the circle, the elliptic curves and the modular curves. In particular, the modular curves $X_0(N)$ are uniformized by the functions $(j(z), j(Nz))$, where $j(z)$ stands for a complex function which is invariant for the action of the modular group $\mathrm{PSL}(2, \mathbb{Z})$. Our purpose will be to obtain explicit uniformizations of the Fermat curves $X^N + Y^N = Z^N$ by making use of functions which are invariant under the action of discrete groups acting on the complex upper half-plane. The talk is based in joint work with Jordi Guàrdia.