

1125-11-475

Edray Herber Goins* (egoins@purdue.edu), Mathematical Sciences Building, 150 North University Street, West Lafayette, IN 47907-2067. *Toroidal Belyĭ Pairs, Toroidal Graphs, and their Monodromy Groups.*

A Belyĭ map $\beta : \mathbb{P}^1(\mathbb{C}) \rightarrow \mathbb{P}^1(\mathbb{C})$ is a rational function with at most three critical values; we may assume these values are $\{0, 1, \infty\}$. A Dessin d'Enfant is a planar bipartite graph obtained by considering the preimage of a path between two of these critical values, usually taken to be the line segment from 0 to 1. Such graphs can be drawn on the sphere by composing with stereographic projection: $\beta^{-1}([0, 1]) \subseteq \mathbb{P}^1(\mathbb{C}) \simeq S^2(\mathbb{R})$. Replacing \mathbb{P}^1 with an elliptic curve E , there is a similar definition of a Belyĭ map $\beta : E(\mathbb{C}) \rightarrow \mathbb{P}^1(\mathbb{C})$. Since $E(\mathbb{C}) \simeq \mathbb{T}^2(\mathbb{R})$ is a torus, we call (E, β) a toroidal Belyĭ pair. The corresponding Dessin d'Enfant can be drawn on the torus by composing with an elliptic logarithm: $\beta^{-1}([0, 1]) \subseteq E(\mathbb{C}) \simeq \mathbb{T}^2(\mathbb{R})$.

This project seeks to create a database of such Belyĭ pairs, their corresponding Dessins d'Enfant, and their monodromy groups. This work is part of PRiME (Purdue Research in Mathematics Experience) with Gabriel Ngwe, Caitlin Leinkaemper, Dionel Jaime, Ivan Gonzalez, and Baiming Qiao. (Received September 02, 2016)