Mirrors of Conformal Dynamics: Julia sets, Kleinian groups, Schwarz reflections, and algebraic correspondences

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We will discuss the interplay between four branches of Conformal Dynamics: iterations of (anti-)rational maps, actions of Kleinian reflection groups, dynamics generated by Schwarz reflections in quadrature domains, and algebraic correspondences. We will show examples of Schwarz reflections obtained by matings between anti-quadratic maps and the triangle modular group, and examples of Julia realizations for Apollonian-like gaskets. Some of these examples can be turned into others by means of a David surgery (e.g., the Apollonian Julia set to the Kleinian Apollonian gasket). The Schwarz reflection parameter space can be sometimes related to the parameter space of the Tricorn or of an appropriate anti-rational parabolic family. The latter can even be done by means of a quasiconformal straightening. For instance, this is the case for the Schwarz families obtained by univalent restrictions of Belyi-Shabat polynomials to appropriate disks. The associated algebraic correspondences are genereted by the deck transformations of these polynomials and by the reflections in the corresponding circles. Based on a joint work with Nick Makarov, Sabya Mukherjee, and many other people.