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*Interactions between conformal field theory and Teichmueller spaces*

Conformal Field Theory (CFT) arose in physics as a special class of two-dimensional quantum field theories. The mathematics of CFT requires the study of Riemann surface whose boundary components are parameterized. The moduli space of these rigged Riemann surfaces arises naturally in the mathematical description. The sewing of two Riemann surfaces by identifying the boundary components is a fundamental operation.

We have recently applied results from Teichmueller theory, such as conformal welding, to CFT. In particular, the sewing operation was shown to be holomorphic.

In on-going work, these results and ideas from CFT are used to give a new structure to the infinite-dimensional Teichmueller space of bordered Riemann surfaces. We show that this Teichmueller space is a complex fiber space over the finite-dimensional Teichmueller space of punctured surfaces. The fibers are spaces of conformal maps with quasiconformal extensions that are closely related to the universal Teichmueller space.

This introductory talk will overview the new and rewarding interplay between these fields.

This is joint work with E. Schippers.