Abstract

In the classical theory, holomorphic quadratic differentials on Riemann surfaces are tied to a wide range of objects, e.g. harmonic functions, Teichmüller space, dynamical systems and minimal surfaces. We present a discretization of holomorphic quadratic differentials that preserves such a rich theory.

We introduce discrete holomorphic quadratic differentials with various examples. On one hand, they arise from circle packings and discrete harmonic functions on graphs. On the other hand, they induce a notion of discrete minimal surfaces. These correspondences to discrete conformal geometry and the surface theory will be discussed in the talk.

The aim is to illustrate Discrete Differential Geometry — structure-preserving discretization in differential geometry, which has led to applications in computer graphics and computational architecture in recent years.