

Speaker: Prof. Dr. Konrad Polthier (Free University Berlin, Germany)

Date: 1st Part, 11th March 2022, 17:00-19:00 JST (9:00-11:00CET)

2nd Part, 17th March 2022, 17:00-19:00 JST (9:00-11:00CET)

Venue: online (zoom)

Title (1st Part): Branched Covering Surfaces – New Shapes, New Materials and New Processes

Abstract (1st Part): The classic geometric view on smooth surfaces hardly fits to the complex and often multiscale physical surface shapes in nature and, nowadays, in industrial applications. In this talk we will introduce a new class of multi-layered surface shapes derived from recent algorithms in geometry processing and related to classic complex analysis. Multivalued functions and differential forms naturally lead to the concept of branched covering surfaces and more generally to branched covering manifolds in the spirit of Hermann Weyl's book "The Idea of a Riemann Surface" from 1913. We will illustrate and discretize basic concepts of branched (simplicial) covering surfaces starting from complex analysis and surface theory up to their recent appearance in geometry processing algorithms and artistic mathematical designs.

Applications will touch discrete and differential surface modeling, image and geometry retargeting, optimal surfaces, spectral modeling, and novel weaved geometry representations.