Friday, May 11th at 11:00 AM

In Room AAC 006

To be followed by discussion

“Voronoi Diagrams and Zone Diagrams”

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Target audience: doctoral students, researchers and Professors in Mathematic.

Abstract:

First we recall the classical and widely applied concept of Voronoi diagram. Then we discuss a new variation of this concept called zone diagram. Given points (sites) \( p_1, \ldots, p_n \) in the plane, each \( p_i \) is assigned a region \( R_i \), but in contrast to the ordinary Voronoi diagrams, the union of the \( R_i \) has a nonempty complement, the neutral zone. The defining property is that each \( R_i \) consists of all points that lie closer (non-strictly) to \( p_i \) than to the union of all the other \( R_j \). Thus, the zone diagram is defined implicitly, by a fixed-point property, and neither its existence nor its uniqueness seem obvious. We prove both, as well as convergence of a natural iterative algorithm for computing it. Many challenging questions remain open, some of them already for the case of two points, where the regions are bounded by an apparently new and interesting planar curve. (Joint work with Tetsuo Asano and Takeshi Tokuyama)