Grünbaum coloring of Eulerian triangulations on surfaces

Atsuhiro Nakamoto

For a triangulation G, a color-assignment $c : E(G) \to \{1, 2, 3\}$ is a *Grünbaum coloring* if each face of G receives the three colors 1, 2 and 3 in the boundary edges [1]. Grünbaum conjectured that every triangulation on any orientable surface admits a Günbaum coloring. However, this conjecture is now known to be false for every orientable surface of genus at least 5 [3], but it is still open for orientable surface of positive genus at most 4. (For the toroidal case, there is a partial result [2].) In my talk, focusing on *Eulerian triangulations* (i.e., one with each vertex even degree), we prove that such triangulations on several surfaces have Grünbaum coloring.

References

[1] B. Grünbaum, Conjecture 6, in: W.T. Tutte (ed.), Recent progress in combinatorics, Academic Press, 1969, p. 343.

[2] M.O., Albertson, H. Alpert, s.-m. belcastro, R. Haas, Grünbaum colorings of toroidal triangulations, J. Graph Theory 63 (2010), 68–81.

[3] M. Kochol, Polyhedral embeddings of snarks in orientable surfaces, Proc. Amer. Math. Soc. 137 (2009), 1613–1619.