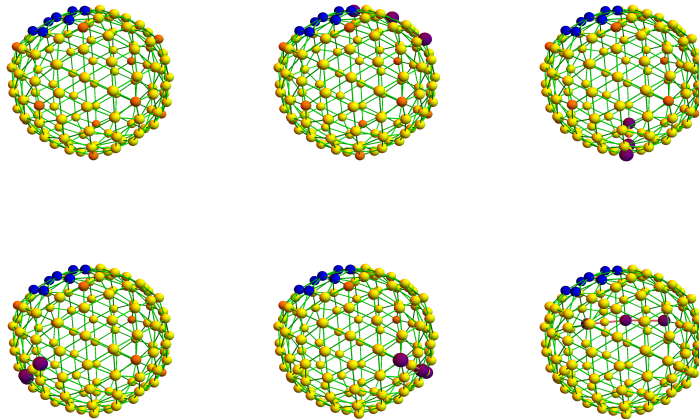


# TOWARDS A TOPOLOGICAL PROOF OF THE FOUR COLOR THEOREM VIII

OLIVER KNILL

ABSTRACT. The knife, which cuts in the off limit part.

The input is a 2 sphere with an open set  $V$  in the form of a disc (shown blue). The goal is to cut the complement so that all vertices have even degree. Pick  $A \in V^c$  of odd degree, then computes the closest point  $B \in V^c$ , then cut along a path from  $A$  to  $B$ . This is repeated until no odd degree vertex is left. "Closest" refers not to geodesic closeness but the distance is the number of cuts which are needed to get from  $A$  to  $B$ . To do so, we form first a new graph with the same vertex set for which two vertices are connected, if their unit spheres intersect in exactly two points. Then we use already in the CA system wired geodesic routine to find the connection leading to the shortest cut.



DEPARTMENT OF MATHEMATICS, HARVARD UNIVERSITY, CAMBRIDGE, MA, 02138

---

*Date:* March 8, 2015, part of public research diary. Possibly and likely to be buggy.

1991 *Mathematics Subject Classification.* Primary: 05C15, 05C10, 57M15 .

*Key words and phrases.* Chromatic graph theory, Geometric coloring.