On the diameter of polytopes

Date Tuesday, April 17

Time 3:30 pm

Location 317 Mudd

Abstract: Santos' construction of counter-examples to the Hirsch conjecture is based on the existence of prismatoids of dimension d of width greater than d. The case $d = 5$ being the smallest one in which this can possibly occur, we here study the width of 5-dimensional prismatoids, obtaining the following results:

- There are 5-prismatoids of width six with only 25 vertices, versus the 48 vertices in Santos' original construction. This leads to lowering the dimension of the non-Hirsch polytopes from 43 to only 20.
- There are 5-prismatoids with $O(w^2)$ vertices and width w for arbitrarily large w.

This is joint work with Francisco Santos and Christophe Weibel.