



MTH 785R: Metric Geometry

CLASS: TUTH 2:00PM - 3:15PM

Textbook: I will try to integrate Bridson–Haefliger, *Metric Spaces of Nonpositive Curvature*, Springer, and Burago–Burago–Ivanov, *A course in metric geometry*, AMS, with some more recent material. You're not expected to buy both books.

Content: Tentative topics list:

1. Definitions: Normed spaces, length spaces, geodesics.
2. Constructions: Products, disjoint unions, gluings, cones.
3. Examples: Spaces of constant curvature, Gauss–Bonnet.
4. Polyhedral spaces and metric graphs.
5. Spaces of bounded curvature.
6. CAT(k) spaces and Cartan–Hadamard theorem.
7. Gromov's lemma and connections to combinatorics.
8. Connections to hyperplane arrangements
9. Connections to hyperbolic group theory.
10. Charney–Davis conjecture.

Grading policy:

- Students will have to present at least two seminars throughout the course. The presentation can be either at the whiteboard, or using an overhead projector; as in the previous semester, I will tediously interrupt with questions and objections, partly because it's my job, partly because it's my character.
- Attendance and interactive participation will play a key role. The presentations are integrating part of the course, so the other students should attend too. There will be no final.

General rules:

- A basic topology course is a prerequisite. That said, the course is accessible to first-year grad students.
- Cell phones are allowed in class, but must be on silent mode. Same policy for pets, spouses, and lovers.

Remarks:

We won't have classes if I am at conferences; you can check in advance my travel schedule at www.math.miami.edu/~bruno/events.html.

With this, I wish you a lovely Spring semester here at The U!

Bruno Benedetti
Assistant Professor