

Syllabus. MATH 282 . Topics In Geometry Fall 2013. Prof. Richard Montgomery

Meetings: MW 12:00PM - 01:45PM McHenry 1279

My office: 4120 McHenry.

My office hours: M 11-12.

Thursday afternoons: 12-2 on 10/10, 10/24; 11/7; 11/21, 11/28. and 2-4 on 10/3, 10 /17, 10/31, 11/14, and any Tea hour you can find me, particularly before the colloquium.

class web site: <http://count.ucsc.edu/~rmont/classes/topicsgeom/index.html>

also: ecommons ..

CLASS PLAN. Each student will read through a recent research paper, present a report on that paper of between two and 20 pages, and give a talk on the paper in class. I suggest choosing a paper in consultation with your advisor. You may also talk to me.

Some suggested papers.

any or all of these papers by Cheeger and Kleiner:

arXiv:0910.2026 Compression bounds for Lipschitz maps from the Heisenberg group to L_1 .

arXiv:0907.3295 Metric differentiation, monotonicity and maps to L^1 .

math/0611954 Differentiating maps into L^1 and the geometry of BV functions.

Kleiner's paper: arXiv:0710.4593 A new proof of Gromov's theorem on groups of polynomial growth.

Any paper by Mohammad Ghomi, in particular:

1. arXiv:1201.1515 Tangent lines, inflections, and vertices of closed curves.

7. math/0409366 Shadows and convexity of surfaces.

10. math/0105138 Circles Minimize most Knot Energies.

Papers by Tabachnikov. In particular:

arXiv:1211.2345 On the discrete bicycle transformation. Serge Tabachnikov, Emmanuel Tsukerman. math.DS (math.DG).

arXiv:1207.5662 Osculating curves: around the Tait-Kneser Theorem. E. Ghys, S. Tabachnikov, V. Timorin. math.DG.

arXiv:1207.0834 Tractrices, Bicycle Tire Tracks, Hatchet Planimeters, and a 100-year-old Conjecture. R. L. Foote, M. Levi, S. Tabachnikov. math.DG.

The ICM paper by Ghys:

See Tao's blog for a ref, or ask me.

<http://terrytao.wordpress.com/2007/08/03/2006-icm-etienne-ghys-knots-and-dynamics/>

Arnol'd:

"... the quotient of the complex projective plane by conjugation"

<http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.50.6421rep=rep1type=pdf>
