
Fall 2003 and Spring 2004

UF Graduate Student TOPOLOGY SEMINAR

Fall Semester: Tuesdays 8th Period (3:00-3:50 PM)

368 Little Hall

Schedule of Talks for Fall Semester

August 26

Rustam Sadykov, *Homotopy invariants of differential relations*

Abstract. For certain differential relations, topological reasonings turns out to be sufficient to determine if a given relation has a solution. Claim. (Co)homology invariants arising from the topology of a complex homogeneous relation form a complete set of invariants. In particular, (co)homology invariants are complete for holomorphic immersions, regular complex wave fronts and Lagrangian maps.

September 2

Rustam Sadykov, *Homotopy invariants of differential relations II*

September 9

Yuli Rudyak, *Examples of non-formal closed simply connected manifolds of dimensions 7 and more*

September 16

Sergei Melikhov, *Geometry of Milnor's invariants*

September 23

Sergei Melikhov, *Geometry of Milnor's invariants* (continued)

September 30

Yuri Turygin, *On maps from spheres to Euclidean spaces*

Abstract. In this talk we will state and prove the theorem Chung-Tao Young on mappings of spheres into Euclidean spaces, which says that for a given positive number $d \leq 2\pi/3$ and any map f of an $(n+1)$ -dimensional sphere into Euclidean n -space, there exist three points x_1, x_2, x_3 such that $f(x_1)=f(x_2)=f(x_3)$ and the spherical distance between any two of x_1, x_2, x_3 is equal to d . We will also discuss other theorems of Borsuk-Ulam type.

October 7

Yuri Turygin, *On the Yang's index*

October 14

Yuri Turygin, *On the Yang's index* (continued)

October 21

Rustam Sadykov, *On constructions of Maxim Kazarian*

October 28

CANCELLED

November 4

Sergey Melikhov, *Coefficients of the multi-variable Alexander polynomial are colored finite type invariants*

November 11

VETERAN'S DAY

November 18

Rustam Sadykov, *Rapidly oscillating functions*

November 25

Alex Scorpan, *Geometric meaning of exterior and Clifford algebras. Part I: Exterior algebras*

December 2

Alex Scorpan, *Geometric meaning of exterior and Clifford algebras. Part II: Clifford algebras*

December 9

Yuli Rudyak, *Formal groups and cohomology theories*

January 13

Yuri Turygin, *On the Chern classes of the regular representation of $(\mathbb{Z}/p)^n$*

Abstract. Following M. Mann and R.J. Milgram we will calculate the Chern classes of the regular complex representation of $G=(\mathbb{Z}/p)^n$, i.e. the Chern classes of the complex vector bundle $EG \times_G \mathbb{C}[G] \rightarrow BG$. This calculations will allow us to prove a Borsuk-Ulam type theorem about free G -actions on the product of spheres.

January 20

Yuri Turygin, *On the Chern classes of the regular representation of $(\mathbb{Z}/p)^n$. II*

January 27

Yuri Turygin, *On the Chern classes of the regular representation of $(\mathbb{Z}/p)^n$. III*

February 3

Sergei Melikhov, *Alexander duality for group presentations*

Abstract. This is an expository talk. A simple argument by G.Huck dating back to 80's shows that the 2-complex modelled on a group presentation can be embedded in S^4 so that the complement collapses onto the 2-complex modelled on the "dual" presentation. A consequence of this argument, which has been generalized by R.Craggs and then further generalized by F.Quinn, received considerable attention in knot theory after its recent rediscovery by Lickorish. Craggs' version: let K, L be arbitrary acyclic 2-polyhedra and Σ^4 any homotopy 4-sphere (say, S^4); then Σ^4 contains an embedded homology 3-sphere whose complementary regions collapse onto 2-polyhedra K' and L' , simple homotopy equivalent with K and L ; moreover the simple homotopy can be realized by Andrews-Curtis moves.

February 10

Sergei Melikhov, *New approaches to homotopy 4-spheres*

February 17

Yuri Turygin, *A Borsuk-Ulam theorem for Z/p^k -actions on spheres*

February 24

Yuri Turygin, *A Borsuk-Ulam theorem for Z/p^k -actions on spheres II*

March 2

Justin Smith, *An introduction to Coarse Structures and Coarse Cohomology*

March 16

Justin Smith, *An introduction to Coarse Structures and Coarse Cohomology II*

March 23

Sergei Melikhov, *Haken's Finiteness Theorem and knots in homotopy S^3 -spheres*

Abstract. Theorem. A homotopy S^3 -sphere M is homeomorphic to S^3 if and only if ω -quasi-isotopy coincides with PL isotopy for knots (or links) in M . Formally, this continues the classical line of attack on the Poincare conjecture by Bing, Haken and Poenaru (back in 60s), as elaborated by McMillan and Smythe. Informally, one does not expect the theorem to have any meaningful implications for the Poincare conjecture, but one does expect that it may be relevant for the Vassiliev conjecture (that finite type invariants classify knots in S^3). Indeed, the (easy) "if" part of the theorem, based on Bing's characterization of S^3 , implies that the "links modulo knots" version of the Vassiliev conjecture fails for knots in each fake 3-sphere (if any). The "only if" part, based on Haken's Finiteness Theorem and invoking Ramsey's Theorem on graph coloring, seems to be "as close" to the links-modulo-knots Vassiliev conjecture as the derived series is to the lower central series.

March 30

Yuli Rudyak, *Cobordisms with singularities*

April 6

Yuli Rudyak, *Cobordisms with singularities II*

April 13

Rustam Sadykov, *Bordism groups of solutions of differential relations*

April 20

Rustam Sadykov, *Bordism groups of solutions of differential relations II*