
Fall 2005 and Spring 2006

UF Graduate Student TOPOLOGY SEMINAR

Fall Semester: Tuesdays 7th Period (1:55-2:45 PM)

305 Little Hall

Schedule of Talks for Fall Semester

September 6

Rustam Sadykov, *The b-principle*

September 13

Rustam Sadykov, *The b-principle* (continued)

Abstract. Last week in the seminar I formulated the h-principle for a sheaf F as the assertion that the sheaf F can be induced from a homotopy functor. We considered an example given by the sheaf of foliations and the corresponding homotopy functor of Haefliger structures. This time I will formulate the b-principle (the bordism version of the h-principle) in terms of a category whose objects and morphisms are given by structures and their bordisms respectively. It turns out that different interesting theorems (such as the Kahn-Priddy theorem and the Mumford conjecture) can be formulated as b-principles for appropriate sheaves. I will also discuss a relation of the b-principle to the algebraic K-theory and present some general results on classifying spaces arising in the b-principle.

September 20

Rustam Sadykov, *Wrinkling of smooth mappings*

Abstract. Wrinkles of smooth maps are fairly simple singularities that might be used to replace more complicated singularities and, thus,

simplify smooth maps. Wrinkling of smooth maps turns out to be an effective tool in proving h-principle type theorems. I will introduce wrinkles and discuss their applications.

September 27

Yuli Rudyak, *A panoramic picture for the proof of the Atiyah - Singer Index Theorem*

Abstract. By this talk we start the project on studying the Atiyah - Singer Index Theorem. In the first talk I sketch the main stages of the proof. In particular, as a first step, we shall see which topological and analytical concepts is necessarily to learn for understanding the Atiyah - Singer Index Theorem.

October 4

Robert Strich, *Pseudodifferential operators and their symbols*

October 11

Robert Strich, *Pseudodifferential operators and their symbols* (continued)

October 18

Robert Strich, *Pseudodifferential operators and their symbols* (continued)

October 25

Michael Jury, *Introduction to K-theory*

November 1

Michael Jury, *Introduction to K-theory* (continued)

November 8

Michael Jury, *Introduction to K-theory* (continued)

November 15

Yuri Turygin, *Characteristic classes*

November 22

Yuri Turygin, *Characteristic classes II*

November 29

Yuri Turygin, *Characteristic classes III*

January 17

Yuli Rudyak, *Review of the proof of the Atiyah-Singer Index Theorem*

January 24

David Groisser, *The Hodge operator*

January 31

David Groisser, *The Hodge operator II*

February 7

David Groisser, *The Hodge operator III*

February 14

Yuli Rudyak, *Topological index of the Hodge operator*

February 21

Yuli Rudyak, *Topological index of the Hodge operator II*

February 28

Yuli Rudyak, *Topological index of the Hodge operator III*

March 7

Yuli Rudyak, *Bordism invariance of the topological index of elliptic operators*

March 28

Robert Strich, *Towards bordism invariance of the analytical index of elliptic operators*

April 4

Robert Strich, *Towards bordism invariance of the analytical index of elliptic operators, II*

April 11

Robert Strich, *Towards bordism invariance of the analytical index of elliptic operators, III*

April 18

Yuri Turygin *The bordism ring of vector bundles*

April 25

Yuri Turygin *The bordism ring of vector bundles II*