

Chicago Algebraic Topology Summer School Schedule

- The talks are in MS 112 at the Stevanovich Center, 5727 S. University Avenue
- The problem sessions are in Eckhart Hall 206
- The Barn (Ryerson Hall 352) will be open for you to use everyday **except Tuesday** after 4 pm. On Tuesday, you may use Eckhart Hall 206 before and after the problem session.

Monday

Talk 1: Introduction (Peter May, 9:10-10:20am)

- Categorical language and the axiomatization of homology
- Homotopy groups, Freudenthal suspension, and the EHP sequence

Talk 2: Geometric Results (Mark Behrens, 10:40-11:50 am)

- Milnor's exotic 7-spheres (Milnor 1956)
- Kervaire's exotic 10-manifolds (Kervaire 1958)

Talk 3: The homotopy category of spaces (Inna Zakharevich, 1:20-2:30 pm)

- The Whitehead theorem, CW approximation and the Eilenberg-Steenrod axioms

Talk 4: Algebraic structure on cohomology (Agnès Beaudry, 2:50-4:00 pm)

- Definition and ring structure on cohomology (late 1930's)
- Steenrod operations (Steenrod 1947)

Problem Session 1 (4:30-6:00 pm)

Tuesday

Talk 1: Vector Bundles 1 (Jesse Wolfson, 9:10-10:20am)

- Definitions of vector bundles, isomorphisms of vector bundles, etc.

Talk 2: Vector Bundles 2 (Jesse Wolfson, 10:40-11:50 am)

- Classifying spaces, Grassmannians
- Classifying vector bundles via homotopy classes of maps into BO_n , BU_n .

Talk 3: Vector Bundles 3 (Agnès Beaudry, 1:20-2:30 pm)

- Stiefel-Whitney classes and relation to Steenrod operations

Talk 4: Cobordism 1 (Inna Zakharevich, 2:50-4:00 pm)

- Cobordism 1 : Definitions, Framed cobordism (Pontryagin 1950)

Problem Session 2 (4:30-6:00 pm)

Wednesday

Talk 1: Cobordism 2 (Inna Zakharevich, 9:10-10:20am)

- Cobordism groups are stable homotopy groups of Thom spaces.

Talk 2: Cobordism 3 (Zhouli Xu, 10:40-11:50 am)

- The calculation of cobordism groups

Talk 3: Cobordism 4 (Agnès Beaudry, 1:20-2:30 pm)

- Application: When is a smooth manifold a boundary?

Talk 4: Cobordism 5/ K -theory 1 (Dylan Wilson, 2:50-4:00 pm)

- Genera: the route from cobordism towards K -theory

Problem Session 3 (4:30-6:00 pm)

Thursday

Talk 1: K -Theory 2 (Peter May, 9:10-10:20am)

- Bott periodicity (Bott, 1957-1959)

Talk 2: K -Theory 3 (Ben Antieau, 10:40-11:50 am)

- The introduction of K -theory (Atiyah-Hirzebruch, 1959-61)

Talk 3: K -Theory 4 (Ben Antieau, 1:20-2:30 pm)

- The Hopf invariant one problem (Adams-Atiyah version 1966)

Talk 4: Onwards-Upwards (Mark Behrens, 2:50-4:00 pm)

Problem Session (4:30-6:00 pm)

Friday

Talk 1: Equivariant Generalizations 1 (Dylan Wilson, 9:00-10:10 am)

- Group actions, equivariant vector bundles and equivariant K -theory

Talk 2: Onwards-Upwards (Ben Antieau, 10:30-11:40 am)

Talk 3: Equivariant Generalizations 2 (Henry Chan, 12:30-1:40 pm)

- Atiyah-Segal Completion Theorem

Talk 4: Onwards-Upwards (Peter May, 2:00-3:10 pm)