Oral exam questions

1 10♠ Topological Euler characteristic and torus actions, p-group actions.

2 J♠ Linear representation of tori, weights, characters

3 Q♠ Topological properties of group actions on smooth manifolds, slice theorem.

4 K♠ Classifying spaces. Examples.

5 A♠ Cohomology of Grassmannians and $BU(n)$.

6 10♣ Borel construction and equivariant cohomology. Examples of computations.

7 J♣ Equivariant formality of compact, smooth algebraic manifolds

8 Q♣ Localization theorem for torus action (about the restriction $H_T^*(X) \to H_T^*(X^T)$).

9 K♣ Localization (Atiyah-Bott, Berline-Vergne formula)

10 A♣ GKM spaces and their equivariant cohomology

11 10♢ Examples of application of the integration formula

12 J♢ Computations of characters via integration on flag manifold.

13 Q♢ Differential model of the equivariant cohomology.

14 K♢ Algebraic model of forms on ET .

15 A♢ The role of the connection in the differential model, and Mathai-Quillena twist.

16 10♡ Symplectic manifolds, hamiltonian actions, the moment map.

17 J♡ Examples of moment polytopes. Permutohedron.

18 Q♡ Quotients and the Kirwan map.

19 K♡ Toric varieties associated to convex polytopes.

20 A♡ Equivariant Schubert calculus on Grassmannians.