2019 Fall Mathematics Seminars

Homological Algebra

- Organizer: Zengrui Han
- Time & Room: TBA
- Preliminary Knowledge: Basic knowledge of category theory
- Reference: [1]
- Remark: We mainly focus on the theory of triangulated categories and derived categories (Chapter 3 and 4 in Manin's textbook)

Algebraic Geometry

- Organizer: Zengrui Han
- Time & Room: TBA
- Preliminary Knowledge: Commutative algebra, basic knowledge of sheaves and schemes
- Reference: [2]

Reprensentation Theory of Lie algebras

- Organizer: Prof. Hongjia Chen
- Time & Room: 1(8,9), 2(11,12), 5307
- Preliminary Knowledge: Basic knowledge of Lie algebra (GTM9 section 1-13)
- Reference: [3]

Algebraic Topology

- Organizers: Jingbin Cai, Kaike Tang
- Time & Room: TBA
- Preliminary Knowledge: Topology, abstract algebra
- Reference: [4]

Differential Topology

- Organizer: Junhao Tian
- Time & Room: TBA
- Preliminary Knowledge: Definition of manifolds, tensor product and topology
- Reference: [5], [6]

Gauge Theory, 4-dimensional geometry and topology

- Organizer: Prof. Bin Xu
- Time & Room: TBA
- Reference: [7], [8]

Theta-functions

- Organizers: Prof. Dafeng Zuo, Prof. Di Yang
- Time & Room: TBA
- Preliminary Knowledge: Complex Analysis
- Reference: [9]

Bibliography

[1] Sergei I Gelfand and Yuri I Manin. *Methods of homological algebra*. Springer Science & Business Media, 2013.

[2] Ravi Vakil. The rising sea: Foundations of algebraic geometry. *preprint*, 2017.

[3] James E Humphreys. *Introduction to Lie algebras and representation theory*, volume 9. Springer Science & Business Media, 2012.

[4] Tammo tom Dieck. *Algebraic topology*, volume 8. European Mathematical Society, 2008.

[5] Raoul Bott and Loring W Tu. *Differential forms in algebraic topology*, volume 82. Springer Science & Business Media, 2013.

[6] James R Munkres. *Elements of algebraic topology*. CRC Press, 2018.

[7] MF Atiyah. Geometry of yang-mills fields, fermi lectures. *Scuola Normale Superiore, Pisa*, 1979.

[8] Simon K Donaldson. Nahm's equations and the classification of monopoles. *Communications in Mathematical Physics*, 96(3):387–407, 1984.

[9] David Mumford, Madhav Nori, and Peter Norman. *Tata lectures on theta I, II, III*. Springer, 2007.

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