**Name：**Introduction to Representations of Reductive Lie groups

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**Speaker Information：**

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Dr. Fangyang Tian graduated from the University of Minnesota in 2018 and studied under Professor Dihua Jiang. He is now a research postdoctoral fellow in the department of mathematics, National University of Singapore.

**Introduction：**The study of Lie groups and representation of Lie groups has a long history which dates back to 19th century. Since then, it has been proved that Lie groups and their representations are quite useful tools in various branches of mathematics, such as differential/algebraic geometry, number theory, as well as in physics.

This crashed course (containing five lectures with 90 minutes each) is devoted to perspective Ph.D. students and young researchers in the field of representation theory and automorphic forms. The goal of this course is to give a short introduction to the Harish-Chandra Regularity Theorem of distribution characters. In these five lectures, we intend to introduce:

1) real reductive groups and some structural theory of real reductive groups, (g, K)-modules of real reductive groups and basic properties

2) Langlands classification of (g, K)-modules, Casselman-Wallach Completion of (g, K)-modules

3) discrete series and Harish-Chandra classification of discrete series

4) distributional character and Harish-Chandra Regularity Theorem

Some basic examples will be discussed in this course, yet detailed proof of some theorems will not be provided as time constraints. The following textbooks are very useful references on representation of real reductive groups, where students can find lots of materials that can supplement these lectures.

**Bibliography:**

1) N. Wallach, Real Reductive Groups I, Academic Press, 1988.

2) N. Wallach, Real Reductive Groups II, Academic Press, 1992.

3) A. Knapp, Representation theory of semisimple groups : an overview based on examples, Princeton mathematical series;36.Princeton,  N.J. : Princeton University Press 1986.

4) R. Howe, E. Tan, Non-abelian harmonic analysis : applications of SL (2, R), New York : Springer-Verlag 1992.