INTRODUCTION

ORGANIZERS

(NOTES BY WENHAN DAI)

What is the Langlands Program?

- **Wee Teck Gan** (National University of Singapore):

The Langlands Program was conceived and initiated by Robert Langlands in the late 1960s. As a mathematical subject, it traces its roots to the foundation work of such illustrious mathematicians as Carl Friedrich Gauss (1777-1855) in the early 19th century and David Hilbert (1862-1943) in the early 20th century.

In the last 50 years, it has been a *major driving force in number theory and representation theory research.* More recently, it has extended its reach to impact such diverse areas as geometry and mathematical physics.

- **Yiannis Sakellaridis** (Johns Hopkins University):

The Langlands Program predicts *surprising connections between different fields of mathematics.* The central prediction is that the solution of Diophantine equations (i.e., the integer solutions to some polynomial equations) is related to the frequencies by which certain "higher-dimensional drums" called arithmetic manifolds oscillate.

Why a summer school on the Langlands Program in 2022?

- **Pierre-Henri Chaudouard** (Institut Mathématique de Jussieu IMG-PRG):

A conference on the Langlands Program took place in Corvallis 45 tears ago. However, during these 45 years, we have seen spectacular progress with the introduction of new methods. At the same time, the scope of the Langlands Program itself has largely increased not only do we want to *pay a tribute to this memorable conference* but we want to *present to the young generation with a bunch of exciting new ideas and the challenging open problems we are faced with.*

What do you hope to achieve during these three weeks?

- **Tasho Kaletha** (University of Michigan):

The past 45 years since the Corvallis meeting, and especially the last 10-15 years, have seen tremendous progress in the Langlands Program – big conjectures have been settled, important tools established, and completely new lines of inquiry have emerged.

During the three weeks of this summer school, we will *survey this recent progress and present a state of the art in terms of new results and open problems.* And as long as these ideas have blossomed into many different strands, we hope to present a *unified vision*

Date: July 11, 2022.

so that the participants appreciate the unity of the program and can better navigate its vast and beautiful landscapes.

School of Mathematical Sciences, Peking University, 100871, Beijing, China

Email address: daiwenhan@pku.edu.cn