

MATH-670

**The theta correspondence**

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Cursus	Sem.	Type
Mathematics		Opt.

Language of teaching	English
Credits	3
Session	
Exam	Oral presentation
Workload	90h
<b>Hours</b>	<b>56</b>
Courses	28
TP	28
<b>Number of positions</b>	<b>20</b>

**Frequency**

Only this year

**Remark**

After several weeks of introductory lectures by the PI the participants are expected to give presentations of some specific aspects of the course.

**Summary**

In the course we will discuss some introductory aspects of the local/global theta correspondence for automorphic forms/representation for various dual pairs. One of the objectives will be to prove Waldspurger's formula relating  $SO(2)$  periods to L-functions.

**Content**

In the course we will discuss some introductory aspects of the local/global theta correspondence for automorphic forms/representation for various dual pairs. After several weeks of introductory lectures by the PI the participants are expected to give presentations of some specific aspects of the course.

- Generalities on automorphic forms and representations (in the adelic language)
- Generalities on the Weil representation.
- The theta correspondance for Orthogonal/Symplectic pairs. Local aspects. Multiplicity one and seesaw duality.
- The theta correspondance for Symplectic/Orthogonal pairs. Global aspects. The Siegel-Weil formula.
- The theta correspondance for special Symplectic/Orthogonal pairs: the Shimizu correspondance and Waldspurger's formula.
- The theta correspondance for some exceptional dual pair.

**Keywords**

theta correspondence, Weil representation, automorphic forms, see-saw duality, automorphic periods, L-functions

**Learning Prerequisites****Required courses**

MATH-417: Adelic Number Theory

MATH-511: Modular forms

MATH-603: Subconvexity, Periods and Equidistribution

**Learning Outcomes**

By the end of the course, the student must be able to:

- Define the general aspects of the theta correspondence and its possible modern applications

## Resources

### Moodle Link

- <https://go.epfl.ch/MATH-670>