

**WYKŁAD WYDZIAŁOWY**  
w ramach seminarium  
**ARYTMETYCZNA GEOMETRIA**  
**ALGEBRAICZNA**

(organizatorzy: Grzegorz Banaszak, Piotr Krasoń)

Czwartek **27 października 2016**, godz. **16:00**, sala **212**

**Wydział Matematyczno-Fizyczny Uniwersytetu**

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*Langlands classification and Langlands  
correspondence for algebraic Lie groups*

**Abstract:** As local part of the Langlands program one wants to assign Galois parameters to irreducible representations  $\pi$  of reductive algebraic groups  $G$  with coefficients in local number fields. The Galois parameter should still carry some of the arithmetic information which is related to an irreducible representation. Depending on which type of valuation we use (archimedean or non-archimedean) the local fields are either  $\mathbb{R}$ ,  $\mathbb{C}$ , or the  $p$ -adic number fields. In this talk we restrict to the archimedean case. More precisely let  $G = G(\mathbb{R})$  be the group of  $\mathbb{R}$ -rational points of an algebraic reductive group which is defined over  $\mathbb{R}$ . Then the local Galois group  $\Gamma = \text{Gal}(\mathbb{C}|\mathbb{R})$  has only two elements, and the local Weil group  $W_{\mathbb{R}}$  is a group extension of  $\Gamma$  which can be easily described. The Galois parameters (introduced by Langlands himself) are actually representations of  $W_{\mathbb{R}}$  with values in Langlands'  $L$ -group  ${}^L G$  which in a sense is dual to  $G$ . Instead of describing the correspondence  $\pi \rightarrow \phi(\pi)$  from representations to Galois parameters directly, we present a reduction to the case where the representation  $\pi$  is tempered and the corresponding Galois parameter  $\phi(\pi)$  is bounded. Such a reduction is achieved by the method of Langlands classification of representations (Langlands 1973) and its counterpart for the classification of Galois parameters. This counterpart has been obtained first for  $p$ -adic base fields (A.Silberger and EWZ), and the method can be taken over to the archimedean case too.