Potential PhD project in Mathematics Radboud University

**Supervisor:** Maarten Solleveld

**Title project:** Pseudo reductive groups and the Langlands program

**Description**
The Langlands program has been spectacularly successful at parametrizing the irreducible admissible representations of reductive groups over local fields. We would like to extend that to a larger class of linear algebraic groups, namely pseudo-reductive groups. Such a generalization may or may not be possible, the main goal of this proposal is to investigate to what extent.

Regarding reductive groups as "well-understood", we will focus on non-reductive pseudo-reductive groups over local fields (necessarily of positive characteristic). First we will work out examples and classify specific kinds of pseudo-reductive groups with small unipotent radical, namely those which are commutative or anisotropic. Then we will construct and parametrize irreducible admissible representations, based on the local Langlands correspondence for tori and on the coadjoint orbit method for unipotent groups. This should lead to an analogue of Langlands parameters for pseudo-reductive groups over local fields.

**Name/Contact of any collaborator(s):**