1. **Peter Scholze: Non-abelian Galois cohomology**

2. **Raoul Blankertz: Cohomology of tori and class field theory**
Explain Tate-Nakayama theory, cf. [4], III §2, cf. also [12], IX. Present the result also in terms of the dual torus, as in [9], §3. Perhaps mention the generalization to groups of multiplicative type, [11], II, §5.8.

3. **Peter Scholze: \( p \)-adic fields**
Prove in the case of classical groups Kneser’s vanishing theorem for simply connected groups over a \( p \)-adic field and the surjectivity of the connecting homomorphism, cf. [4], IV., comp. also [14]. Deduce from this a classification theorem for reductive \( p \)-adic groups, cf. [9], §6.

4. **Daniel Gerigk: Classification of reductive groups over \( \mathbb{R} \)**
Explain [1], II, Satz 4, Thm 6, Satz 8, and III, Thm 8 and Thm 9, and give an instructive example from Kap. IV. Compare with the \( p \)-adic case.

5. **Sean Wilson: Steinberg’s Theorem**
Explain the proof of Steinberg’s theorem [13] which implies the vanishing of \( H^1(k, G) \) for any connected linear algebraic group over a field \( k \) of cohomological dimension \( \leq 1 \).

6. **Timo Richarz: The Hasse principle, the proof for type \( A_n \)**
Here the Hasse principle should be stated over a number field, as well as the surjectivity of the connecting homomorphism into \( H^2(k, F) \), where \( F \) is the fundamental group of the adjoint group, cf. [4], V, §§1–3. Then the proof in the case of type \( A_n \) should be given, cf. [4], V, §5. See also [8]

7. **Eugen Hellmann: The strong approximation theorem**
The theorem should be explained and contrasted to the weak approximation theorem, comp. [5]. Then the proof should be explained in the case of the unit group of a simple algebra, cf. [6], §§3, 4. A proof in general that does not use the Hasse principle is in [10], §7.4.

8. **Nicolas Vandenbergen: Landherr’s theorem**
This is the Hasse principle for type \( 2A_n \). It should be proved, following [3], §2.

9. **t.b.a.: The Hasse principle for some other types**
Here one should explain how one can treat some other types, following [3], §3.

10. **Paul Hamacher: Reformulation in terms of the \( L \)-group**
Here one should give Kottwitz’s formulation in [9], §4 (without using \( Br_a(G) \)).

It is not to be expected that each item above can be treated in one session of the seminar.
Literatur


