

# Homological stability for Hurwitz spaces and the Cohen-Lenstra conjecture (after Ellenberg, Venkatesh and Westerland)

Martin Palmer-Anghel // GeMAT seminar, IMAR // 13 and 20 January 2023

## Abstract.

These are parts 2 and 3 of a sequence of 3 expository talks following the paper [EVW] (as well as the expository Bourbaki seminar notes [RW]), which proves an “asymptotic” version of the Cohen-Lenstra conjecture for function fields.

I will first explain (as a recap of talk 1) how they reduce the proof of this number-theoretic result to a purely topological result (homological stability) for *Hurwitz spaces*. I will then explain how they prove this homological stability result, for which they have to invent new techniques, compared with the “classical” methods of proving homological stability, in order to deal with the complicating fact that Hurwitz spaces are disconnected.

## References.

- [EVW] J. Ellenberg, A. Venkatesh, C. Westerland, *Homological stability for Hurwitz spaces and the Cohen-Lenstra conjecture over function fields*, *Ann. Math.*, 2016.
- [RW] O. Randal-Williams, *Homology of Hurwitz spaces and the Cohen-Lenstra heuristic for function fields (after Ellenberg, Venkatesh, and Westerland)*, *Séminaire Bourbaki*, 2019.