Low degree Hurwitz stacks in the Grothendieck ring

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For $2 \leq d \leq 5$, we show that the class of the Hurwitz space of smooth degree $d$, genus $g$ covers of $\mathbb{P}^1$ stabilizes in the Grothendieck ring of stacks as $g \to \infty$. We will survey the connections between this result and related stabilizations occurring in algebraic geometry, number theory, and topology. This is based on joint work with Ravi Vakil and Melanie Matchett Wood.