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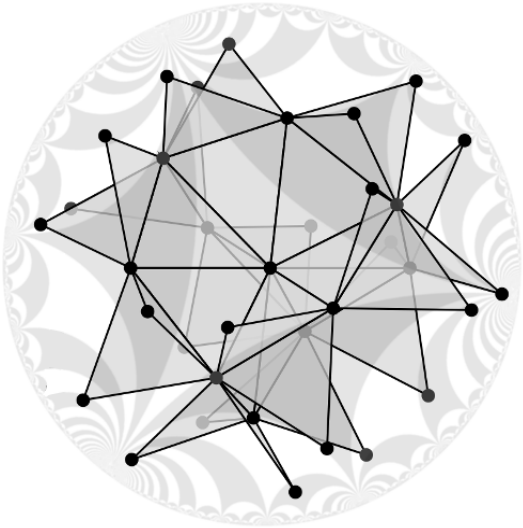

THE GEOMETRY OF GALOIS REPRESENTATIONS

Abstract. The arithmetic of number fields can be profitably studied through the representation theory of their absolute Galois groups. These representations exhibit a number of elegant and surprising phenomena, most famously the quadratic reciprocity law. Many of these phenomena are explained by the modularity conjecture of Langlands that all Galois representations come from modular forms. Startling progress towards this conjecture began with Taylor and Wiles's study of Galois deformation spaces. We give a construction of local models for some Galois deformation spaces coming from geometric representation theory, and describe some applications to modularity conjectures and congruences between modular forms. Much of what we discuss is joint work with Bao Le Hung, Brandon Levin, and Stefano Morra.

Daniel Le (University of Toronto)

Daniel Le obtained his Ph.D. in Mathematics from the University of Chicago in 2015, under the supervision of Matthew Emerton. From 2015 to 2016 he was a Postdoctoral Fellow at the University of Toronto, and from 2016 to 2017 a Member of the Institute for Advanced Study. Since 2017 Dr. Le is back at the University of Toronto as a NSF Postdoctoral Research Fellow. His awards also include a NSF Graduate Research Fellowship (2009–2014) and the AMS-Simons travel grant (2016–2018). Daniel Le's research interest include algebraic number theory, the p-adic Langlands program, Galois representations, p-adic representation theory, and p-adic Hodge theory.

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