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David E Nadler* (denadler@gmail.com), Department of Mathematics, Northwestern University, 2033 Sheridan Rd, Evanston, IL 60208. *The Geometric Nature of the Fundamental Lemma.*

The Fundamental Lemma is a somewhat obscure combinatorial identity introduced by Robert P. Langlands as an ingredient in the theory of automorphic representations. After many years of deep contributions by mathematicians working in representation theory, number theory, algebraic geometry, and algebraic topology, a proof of the Fundamental Lemma was recently completed by Ngô Bau Châu, for which he was awarded a Fields Medal. Our aim here is to touch on some of the beautiful ideas contributing to the Fundamental Lemma and its proof. We highlight the geometric nature of the problem which allows one to attack a question in p -adic analysis with the tools of algebraic geometry. (Received September 03, 2010)