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The Langlands program: past, present, and future

In this talk I will discuss the functoriality and reciprocity conjectures of Langlands, which are the central focus of the Langlands program. I will begin with a historical overview of the theory of reciprocity laws in number theory, and then explain Langlands's very general reciprocity conjecture. This conjecture itself suggests another conjecture, purely within the theory of automorphic forms: the functoriality conjecture. (The historical order of the discovery of these conjectures was in the opposite order, with the functoriality conjecture being formulated first, in Langlands' famous letter to Weil.) In fact, as Langlands already observed, functoriality, formulated in a suitably broad fashion, can to a certain extent incorporate reciprocity within its framework. In any case, the two problems are closely related. I will close the talk by describing some examples of recent progress (by various authors) on both conjectures.