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*Modularity Lifting via Analytic continuation of Hilbert modular forms*

In his foundational work on the theory of  $p$ -adic modular forms, N. Katz observed that there is a positive lower bound for the "growth condition" of an overconvergent  $p$ -adic modular eigenform with nonzero  $U_p$ -eigenvalue. In more modern language, this states that any such form can be analytically continued from its initial domain of definition to a not "too small" region of the rigid analytic modular curve. Years later, K. Buzzard, by adding  $\Gamma_0(p)$  to the level, proved that such forms can be further extended to a certain "large" region of the modular curve. These results were used by Buzzard and Taylor to prove modularity lifting results which led to a proof of certain cases of the Strong Artin conjecture.

It has been known for a while how to extend these results to the Hilbert case when  $p$  is split in the totally real field of degree  $g > 1$ , as the problem looks formally like a product of  $g$  copies of the modular curve case. In the inert case, however, a mixing happens that fundamentally changes the nature of the problem. In this talk, I will explain new results on domains of automatic analytic continuation for overconvergent Hilbert modular forms in the case  $p$  is unramified in the totally real field. These results can be used to prove many cases of the strong Artin conjecture for Hilbert modular forms. Some of the work that will be presented is joint with Sasaki and Tian.