Congruences between automorphic forms and Galois representations have proven to be powerful tools in the Langlands program. The search for a representation-theoretic framework for these congruences naturally leads us to study mod $p$ representations of $p$-adic groups. Rather little is presently known about the characteristic $p$ case, which seems to be substantially different from other characteristics. We will highlight some recent results and questions in the area, mainly focusing on the case of $GL_2$. 

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mod $p$ representations of $p$-adic $GL_2$