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Kirsten Eisentraeger*, Department of Mathematics, The Pennsylvania State University,
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Hilbert's Tenth Problem in its original form was to find an algorithm to decide, given a multivariate polynomial equation with integer coefficients, whether it has a solution over the integers. In 1970 Matijasevich, building on work by Davis, Putnam and Robinson, proved that no such algorithm exists, i.e. Hilbert's Tenth Problem is undecidable. Since then, analogues of this problem have been studied by asking the same question for polynomial equations with coefficients and solutions in other commutative rings. In this talk we will discuss some recent results for function fields of positive characteristic, both for transcendence degree one and higher transcendence degree. (Received September 17, 2011)