1116-13-834 **Claudia Polini*** (cpolini@nd.edu), 255 Hurley Building, Department of Mathematics, University of Notre Dame, Notre Dame, IN 46556-5641. *Rees rings and singularities of curves.*

Let $f_1, \ldots, f_n$ be forms of the same degree in the polynomial ring $R = k[x_1, x_2]$ that define a regular map $\Phi : \mathbb{P}^1 \to \mathbb{P}^{n-1}$. The bi-homogeneous coordinate ring of the graph of Φ as a subvariety of $\mathbb{P}^1 \times \mathbb{P}^{n-1}$ is the Rees algebra $\mathcal{R}(I) = R[f_1 t, \ldots, f_n t]$ of the ideal $I = (f_1, \ldots, f_n) \subset R$, whereas the homogeneous coordinate ring of the closed image of Φ, the curve $X \subset \mathbb{P}^1$ parametrized by $f_1, \ldots, f_n$ is the subalgebra $k[f_1 t, \ldots, f_n t] \cong \mathcal{R}(I) \otimes k$. It is a fundamental problem in elimination theory, commutative algebra, algebraic geometry, and applied mathematics to determine the defining ideals of these rings. Since this is a very ambitious goal, an important first step is to determine or at least bound the (bi)-degrees of the defining equations. In this talk I will survey several approaches to solve this problem. In addition, I will explain how features of the defining ideals correspond to the types and the constellation of the singularities of the curve X. (Received September 14, 2015)