1100-13-296 **Michael R DiPasquale*** (dipasqu1@illinois.edu), Department of Mathematics, 1409 W. Green Street, Urbana, IL 61801. *Castelnuovo-Mumford Regularity of Spline Modules.* Preliminary report.

The $\mathbb{R}$-algebra $C^r(\mathcal{P})$ of piecewise polynomial functions (splines) of smoothness r on a pure n-dimensional polytopal complex $\mathcal{P} \subset \mathbb{R}^n$ is of fundamental interest in approximation theory and numerical analysis. In the late 1980s, Billera pioneered the use of tools from commutative and homological algebra in the study of splines. Following his approach as well as later refinements by Schenck, Stillman, Stiller, and others, we discuss how several questions may be phrased in terms of Castelnuovo-Mumford regularity and the benefits of using this machinery. We will primarily be concerned with the case $\mathcal{P} \subset \mathbb{R}^2$. (Received February 10, 2014)