1052-13-134 **Timothy B.P. Clark*** (tbpclark@math.northwestern.edu), Mathematics Department, 2033 Sheridan Road, Evanston, IL 60208. *Poset resolutions of monomial ideals.*

Let P be a finite partially ordered set (poset) with set of atoms A and let k be a field. Considering certain open intervals of P, we utilize a construction of Tchernev to produce a sequence of k-vector spaces and vector space maps $\mathcal{D}(P)$. When a poset map $\eta : P \to \mathbb{Z}^n$ exists, the sequence $\mathcal{D}(P)$ is homogenized to approximate a free resolution $\mathcal{F}(\eta)$ of R/N where N is the monomial ideal in $k[x_1, \ldots, x_n]$ whose set of minimal generators is $\{x^{\eta(a)} : a \in A\}$. When $\mathcal{F}(\eta)$ is an exact complex of multigraded modules, we call it a *poset resolution* of R/N. We show that the poset which provided our original motivation, the lcm-lattice associated to N, supports the minimal free resolution for a class of ideals we call *lattice-linear*. This class of monomial ideals contains both the class of ideals with a linear resolution and the class of Scarf ideals. More generally, poset resolutions provide a common framework from which to view a number of (not necessarily minimal) resolutions previously constructed using distinct methods. Specifically, we show that both the Taylor resolution and Eliahou-Kervaire minimal resolution may be viewed as poset resolutions. (Received August 26, 2009)