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Tristram Bogart*, Cra. 1 No. 18A- 12, Bogota, Colombia, **Mark Contois**, ON , Canada, and **Joseph Gubeladze**, Department of Mathematics, San Francisco State University, Thornton Hall 937, 1600 Holloway Ave, San Francisco, CA 94132. *Hom polytopes and cones.*

Given two full-dimensional convex cones C and C' in vector spaces V and V' , the hom-cone is the set of linear maps from V to V' that take C into C' . With Mark Contois and Joseph Gubeladze, we provide a range of results and examples in the case that C and C' are graded polyhedral cones. (Taking slices of the cones, we equivalently consider affine maps between polytopes.) Velasco recently extended some of the results to general convex cones, including the important case of the cone of positive semidefinite matrices, and many open questions remain. (Received September 19, 2012)