1077-47-2691 **Victor Vinnikov*** (vinnikov@math.bgu.ac.il), Department of Mathematics, Ben Gurion University of the Negev, 84105 Beer Sheva, Israel. *Noncommutative functions: examples and key features.*

A *noncommutative (nc) space* $\mathcal{V}_{\rm nc}$ over a vector space $\mathcal{V}$ is the disjoint union of the spaces of $n \times n$ matrices over $\mathcal{V}$ for all n; if $\mathcal{V}$ is an operator space, $\mathcal{V}_{\rm nc}$ carries a natural topology, induced by the sequence of matrix norms. A subset of $\mathcal{V}_{\rm nc}$ is called a *nc set* if it is closed under direct sums. A function f from a nc set in $\mathcal{V}_{\rm nc}$ to $\mathcal{W}_{\rm nc}$, for vector spaces $\mathcal{V}$ and $\mathcal{W}$, is called a *nc function* if it maps $n \times n$ matrices to $n \times n$ matrices for all n and satisfies certain compatibility conditions as we vary the matrix size n — namely, if it respects direct sums and similarities, or equivalently, intertwinings.

I will discuss some examples of nc functions (polynomials, rational functions, and power series in noncommuting inderterminates, as well as various transforms arising in operator-valued free probability), and some key features of their theory, including the regularity properties (roughly, local boundedness implies continuity and analyticity) and the power series expansions. This is a joint work with Dmitry Kaliuzhnyi-Verbovetskyi. (Received September 22, 2011)