\* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \*

# Food for Thought

# Evangelos "Vaki" Nikitopoulos, Ph.D. Candidate

UCSD

# Choose Your Own Functional Calculus Adventure

**Abstract:**

Let $A$ be a (unital) algebra over the complex numbers and $a \in A$. At a very high level, the term *functional calculus* refers to constructions of the form, "Take some collection $\mathcal{F}$ of scalar functions, and, for all $f \in \mathcal{F}$, define $f(a) \in A$ in a sensible way." One can always take $\mathcal{F} = \mathbb{C}[t]$ with the obvious definition of $p(a) \in A$ for $p \in \mathbb{C}[t]$, but this is pretty much the end of the construction when $A$ has no additional structure. When $A$ has some analytic structure – as is frequently the case in functional analysis and operator algebras – one can construct functional calculi for much larger classes of functions. In this slightly experimental talk, it is possible that I will discuss functional calculus in Banach algebras, $C^*$-algebras, and/or von Neumann algebras. The talk will be in a "choose your own adventure" style, so the audience will decide the exact trajectory of the talk democratically. (I offer my thanks to Max Johnson for the idea to give this kind of talk.) Prerequisites will be minimal: passing familiarity with norms, inner products, bounded/continuous linear maps, completeness, etc. should suffice.

# Tuesday, December 7, 2021
# 2:00 PM
# AP&M 5402

\* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \*