February 8: Bertram Kostant (MIT), “Center of $U(n)$, cascade of orthogonal roots, and a construction of Wolf-Lipsman.”

Let $G$ be a complex simply-connected semisimple Lie group and let $\mathfrak{g} = \text{Lie}G$. Let $\mathfrak{g} = \mathfrak{n} - + \mathfrak{h} + \mathfrak{n}$ be a triangular decomposition of $\mathfrak{g}$. One readily has that $\text{Cent} \ U(\mathfrak{n})$ is isomorphic to the ring $S(\mathfrak{n})^n$ of symmetric invariants. Using the cascade $B$ of strongly orthogonal roots, some time ago we proved (see [K]) that $S(\mathfrak{n})^n$ is a polynomial ring $\mathbb{C}[\xi_1, \ldots, \xi_m]$ where $m$ is the cardinality of $B$. The authors in [LW] introduce a very nice representation-theoretic method for the construction of certain elements in $S(\mathfrak{n})^n$. A key lemma in [LW] is incorrect but the idea is in fact valid. Here we modify the construction so as to yield these elements in $S(\mathfrak{n})^n$ and use the [LW] result to prove a theorem of Tony Joseph.
