A $\Pi$-algebra is a graded group with additional structure that makes it look like the homotopy groups of a space. Given one such object $A$, one may ask if it can be realized topologically: Is there a space $X$ such that $\pi_* X$ is isomorphic to $A$ as a $\Pi$-algebra, and if so, can we classify them?

Work of Blanc-Dwyer-Goerss provided an obstruction theory to realizing a $\Pi$-algebra $A$, where the obstructions (to existence and uniqueness) live in certain Quillen cohomology groups of $A$. What do these groups look like, and can we compute them?

We will tackle this question from the algebraic side, focusing on Quillen cohomology of truncated $\Pi$-algebras. We will then use the obstruction theory to obtain results on the classification of certain 2-stage homotopy types, and compare them to what is known from other approaches.