Decades of high energy experiments along with QCD factorization theorems have provided some, but limited, insights of the structure of the nucleon in terms of quarks and gluons degrees of freedom. With the Jefferson Lab 12 GeV program running, new opportunities and challenges are emerging in the quest to characterize the structure of the nucleon with even higher resolution. In this talk I will discuss recent progress made by the Jefferson Angular Momentum (JAM) collaboration that aim to build the ultimate framework for QCD global analysis.