1152-65-339 **Alessandro Veneziani*** (avenez2@emory.edu), 400, Dowman Dr NE, Atlanta, GA 30322, and **Huijuan Xu** and **Alexander Viguerie**. *Recent advances in the fast simulation of the Steady Incompressible Navier-Stokes Equations.*

The efficient numerical solution of the Steady Incompressible Navier-Stokes equations is receiving more attention recently, driven by some applications where steadiness is solved as a surrogate of time average (see, e.g., [Tang, Chun Xiang, et al., JACC: Cardiov Imag (2019)]). The efficient numerical solution is challenged by the absence of the time derivative, that makes the algebraic structure of the problem more problematic. In this talk, we cover some recent advances considering smart algebraic factorizations to mimic splitting strategies popular in the unsteady case [A. Viguerie, A. Veneziani, CMAME 330 (2018)], new stabilization techniques inspired by turbulence modeling [A. Viguerie, A. Veneziani, JCP 391 (2019)] and the treatment of nonstandard boundary conditions emerging in computational hemodynamics [A. Veneziani, A. Viguerie, in preparation (2019)], that inspired this research. In the latter case, the focus will be on the so-called backflow and inflow instabilities [H. Xu et al., submitted (2019)] occurring in defective problems (i.e., problems where the data available are incomplete to make the mathematical formulation well-posed). Dedicated to the memory of Dr. G. Zanetti (1959-2019). The NSF Project DMS-1620406 supported this research. (Received September 08, 2019)