1158-76-252 **Francois Blanchette***, 5200 N. Lake Rd, Merced, CA 95343. *Modeling and simulations of porous marine aggregates.*

Settling marine aggregates plays an important role in transporting carbon from the surface ocean to the deep ocean. Investigations of settling rates is critical to understand the ecological impact of these particles. We present first a numerical study of the settling of a porous sphere in a density-stratified ambient fluid. We quantify the retention time, during which the sphere is nearly at rest as a function of various governing parameters. However, naturally occurring marine aggregates are very irregular, having in fact been shown to have a fractal structure. We therefore study numerically the fluid forces acting on aggregates formed by the diffusion-limited aggregation of cubic particles. We characterize the drag of translation flows, the torque of rotational flows, and the straining force of extensional flows acting on aggregates as a function of their size and mode of formation. Time permitting, we will revisit the formation mechanism of marine aggregates to incorporate the results obtained on their drag and torque. We study numerically the formation of aggregates using a Brownian dynamics model where the mobility tensor of each aggregate depends on its shape and size as computed by our boundary integral method. (Received March 02, 2020)