1027-35-218 **Coutand Daniel** and **Steve Shkoller*** (shkoller@math.ucdavis.edu), Department of Mathematics, University of California at Davis, Davis, CA 95616. *Well posedness of the free surface Euler equations with or without surface tension.*

We describe a general method for treating free boundary problems in perfect fluids, and prove local-in-time well-posedness in Sobolev spaces for the free-surface 3D Euler equations with or without surface tension for arbitrary initial data, and without any irrotationality assumption on the fluid. This is a free boundary problem for the motion of a perfect liquid in vacuum, wherein the motion of the fluid interacts with the motion of the free-surface at highest-order. (Received February 27, 2007)