1165-35-307 **Albert Ai*** (aai2@wisc.edu), **Mihaela Ifrim** and **Daniel Tataru**. *Two dimensional gravity water waves at low regularity.*

Abstract: In this talk, we will consider the low regularity well-posedness problem for the two dimensional gravity water waves. This quasilinear dispersive system admits an interesting structure which we exploit to prove a new class of energy estimates, which we call balanced cubic estimates. This yields a key improvement over the earlier energy estimates of Hunter-Ifrim-Tataru. These results allow us to significantly lower the regularity threshold for local well-posedness, even without using dispersive properties. Combined with nonlinear vector field Sobolev inequalities, an idea first introduced by the last two authors in the context of the Benjamin-Ono equations, these improvements extend to global solutions for small and localized data. This is joint work with Mihaela Ifrim and Daniel Tataru. (Received January 19, 2021)