

Abstract for an Invited Paper
for the DAMOP11 Meeting of
The American Physical Society

Efimov physics and more: the ultracold few-body problem¹

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Few-body physics has seen a few rather dramatic experimental realizations of long-predicted Efimov physics in the last five years. These successes have come thanks to the unprecedented control that ultracold atomic gases afford for few-body systems. We have made considerable progress in understanding the universal aspects of these ultracold few-body collisions. The experiments, however, have not yet been carried out in a fully universal regime. I will discuss some of my group's efforts to understand how the usual universal inelastic rate constant expressions must be modified in this case. We have also begun to look in new directions for signatures of the Efimov effect and find it quite pervasive — appearing, for instance, in the four-body problem and in optical lattices. Moreover, we have identified surprising new few-body effects beyond Efimov's that might also be accessible in ultracold experiments.

¹Supported by the Air Force office of Scientific Research and the National Science Foundation.

²In collaboration with J.P. D'Incao, H. Suno, Y. Wang, N. Guevara, E. Meyer, and F. Anis