

Abstract for an Invited Paper  
for the MAR09 Meeting of  
The American Physical Society

**Astrophysical Computation in Research, the Classroom and Beyond**

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In this talk I review progress in the use of simulations as a tool for astronomical research, for education and public outreach. The talk will include the basic elements of numerical simulations as well as advances in algorithms which have led to recent dramatic progress such as the use of Adaptive Mesh Refinement methods. The scientific focus of the talk will be star formation jets and outflows while the educational emphasis will be on the use of advanced platforms for simulation based learning in lecture and integrated homework. Learning modules for science outreach websites such as DISCOVER magazine will also be highlighted.