

Abstract for an Invited Paper  
for the SES10 Meeting of  
The American Physical Society

**The role of physics in atmospheric, ocean and Earth science**

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The Earth system is a very complex system made of the Atmosphere, the Biosphere, the Hydrosphere, the Cryosphere and the solid portion of the Earth's surface. These components interact with each other in very complex highly nonlinear ways. Advances in remote sensing techniques and computational capabilities have allowed Earth system science to make substantial advances and contributions in the fields of geophysical fluid dynamics, chemistry, biology, cloud and aerosols dynamics and interactions, and computational science. Some of the major scientific achievements will be described. The scientific issues facing our field will be discussed, including challenges of climate and feedback mechanisms. Throughout the presentation, emphasis will be given to the physics behind our science.