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Virtual Laboratories and Interactive Demonstrations for Multimedia Teaching Tools

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The use of images, films and animations in teaching fluid mechanics has a long history that can be traced back through the MIT/NCFMF films in the 1960s, through Milton van Dyke's "Album of Fluid Motion", to projects that enlarge the functionality to allow interaction with the media. One such project is "Multimedia Fluid Mechanics", (Cambridge Univ. Press (2001)) and its forthcoming second edition. This talk will focus on the conceptualization and implementation of two types of interactive pieces within MMFM: the self-contained Virtual Laboratory and the Interactive Demonstration. I will give examples of both and use these to discuss the principles we applied in conceiving them and the various lessons we have learned from their development. Examples will include Laminar Boundary Layer Growth, Control Volume Analysis of Drag on Bluff Bodies, Pendant Drop Measurements of Surface Tension, and Reynolds Averaging of Turbulent Signals.