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Nonlinear transient growth and detecting the laminar-turbulent boundary RICH KERSWELL, CHRIS PRINGLE, Bristol University — The area of transition to turbulence has experienced a spurt of activity recently in wall-bounded shear flows where transition is triggered by finite amplitude disturbances. This has been stimulated by the discovery of new solutions to the governing equations which are disconnected from the steady unidirectional “base” flow in, for example, pipe flow and plane Couette flow. Understanding how all this new (nonlinear) work fits together with transient growth ideas which focus on linear mechanisms based around the base state presents an interesting challenge. In this talk, we attempt to bridge the gap from linear optimals to the (very nonlinear) laminar-turbulent boundary in phase space which determines whether a given disturbance will trigger turbulence or not.

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