

SPRING 2019  
MATH 595 BSC  
BRIDGELAND STABILITY CONDITIONS AND APPLICATIONS

Time: TBA

Instructor: Sheldon Katz

Prerequisites: Algebraic Geometry II (Math 595AG2) or equivalent, or permission of the instructor

This first half minicourse introduces the topic of Bridgeland Stability together with applications.

In 2002, Tom Bridgeland proposed his notion of stability as a precise mathematical formulation of the notion of Pi-stability in string theory. The notion proved to be the ‘correct’ one, and a theory was born. Applications include moduli problems arising in algebraic geometry and the theory of quiver representations; birational geometry; and connections to physics.

The course will begin with “Lectures on Bridgeland Stability,” Macri and Schmidt, [arXiv:1607.01262\[math.AG\]](https://arxiv.org/abs/1607.01262). The lecture notes begin with the classical notion of stability of vector bundles. Then Bridgeland stability is introduced and applied to surfaces and threefolds, with some applications.

Additional topics will be covered as time allows, possibly including other moduli spaces in algebraic geometry and quiver representation theory; birational geometry; and connections to string theory and mirror symmetry.