

1097-81-212

Jacob Lewis Bourjaily* (bourjaily@fas.harvard.edu), Harvard University, Department of Physics, 17 Oxford Street, Cambridge, MA 02138. *Scattering Amplitudes and the Positive Grassmannian*.

In the past ten years, the study of scattering amplitudes in quantum field theory has led to a revolutionary reformulation of the subject. This revolution began with the discovery, in 2005, of a recursive expansion for scattering amplitudes (to leading order) in terms of planar, two-colored, trivalent graphs—called "on-shell diagrams." Around the same time that these diagrams were first drawn by physicists, they also started to appear in the mathematical literature (for entirely independent reasons) in the context of the positroid stratification of Grassmannian manifolds. Recently, these two previously independent lines of research came together, leading to many valuable insights on both sides. In my talk, I will outline the physical ideas behind these developments, and explain the many deep connections which have been found between scattering amplitudes and the geometry and combinatorics of the positroid stratification of the Grassmannian. Although some familiarity with quantum field theory would be useful, the talk should be entirely self-contained and accessible to those without any background in physics. (Received January 22, 2014)