

1086-VL-1507      **Shawn Michael Westmoreland\*** ([westmore@math.ksu.edu](mailto:westmore@math.ksu.edu)), 2020 Tunstall Circle, Apt. 11,  
Manhattan, KS 66502. *Optical black holes and solitons.*

As Novello has emphasized, light rays in nonlinear electrodynamics follow null geodesics with respect to an effective geometry which generally differs from the background gravitational spacetime geometry. A form of nonlinear electrodynamics which is a good approximation to quantum electrodynamics is Euler-Heisenberg (EH) theory. The question can be raised whether it is possible for (optical) black holes to form in the EH effective geometry. Indeed, we already have an exact solution to the EH field equations for which the corresponding effective geometry contains a cylindrical black hole. It is conjectured that there are also soliton solutions to the EH field equations corresponding to black holes. (Received September 22, 2012)