1056-85-1646   **Philip S Naudus*** (`pnaudus1@gmu.edu`), 4745 Holly Ave., Fairfax, VA 22030. *Computer Model of Gravitational Lensing Systems.*

Gravitational lensing is a phenomenon which occurs when light from a distant galaxy (referred to as a source galaxy) is deflected by a lensing galaxy. Because of the elaborate mass distribution of lensing galaxies, images become highly distorted, which complicates studying these source galaxies. By solving the gravitational lens equation (in reverse), we were able to map the observed image back onto the plane of the source galaxy. However, this method assumes we know the mass distribution of the lensing galaxy, which is actually not the case since as much of 90% of a galaxy's mass can be dark matter. To solve this problem, we varied the parameters of the lensing galaxy until we were able to reproduce the observed images. Although this is a computationally intense process, we have shown that the dark matter distribution can be found relatively quickly by incorporating interaction between a user and the computer (solutions were found within a few minutes in our test cases). For this reason, current work is underway to create an interactive Java applet which will allow non-experts to contribute to the modeling process. This project promises to determine properties of source galaxies in addition to finding the allocation of dark matter in gravitational lensing systems. (Received September 22, 2009)