1072-49-81 **Aaron Luttman*** (aluttman@clarkson.edu), 10 Clarkson Ave., Box 5815, Potsdam, NY 13699, and **Johnathan Bardsley**. *A Projected Lagged-Diffusivity Fixed Point Iteration for Poisson Likelihood Image Deblurring.*

Image deblurring problems are usually formulated as linear operator equations of the form $Au = z$, where z is the measured image, A is the image blurring operator based on the (measured) point-spread function, and u is the ideal image that one wishes to reconstruct. Rather than computing u using a least-squares approach, one can instead compute a minimizer of

$$E(u) = \int_\Omega (Au + \gamma - z \log(Au + \gamma))\, d\Omega,$$

where $\Omega \subset \mathbb{R}^2$ is the image domain and $\gamma > 0$ is the expectation of a Poisson random variable describing the background radiation. This approach allows one to take into consideration the Poisson nature of two of the three primary errors involved. We present a reconstruction algorithm based on the lagged diffusivity fixed point iteration that combines a quasi-Newton iteration with projection onto the non-negativity constraints for computing an approximate minimizer to the above functional and show results on synthetic astronomical imagery. (Received June 20, 2011)