1056-65-2138 **Daniela Calvetti*** (dxc57@case.edu), Department of Mathematics, 10900 Euclid Avenue, Cleveland, OH 44106, and **Erkki J. Somersalo**. *Bayesian Scientific Computing.*

In many computational problems where the data is scarce and of poor, augmenting standard algorithms with available qualitative information about the sought solution may dramatically improve the results. In this talk we outline how to recast some classes of computational problems within a Bayesian framework while retaining algorithmic efficiency. In addition to showing how this approach can be used to assess the reliability of the results, we will discuss how the the weight of the prior is a function of the quality of the data. The results of some computed examples arising from imaging applications will be presented. (Received September 23, 2009)