

## Distinguished Colloquium Series in Interdisciplinary & Applied Mathematics

**Tuesday, March 25, 2014**

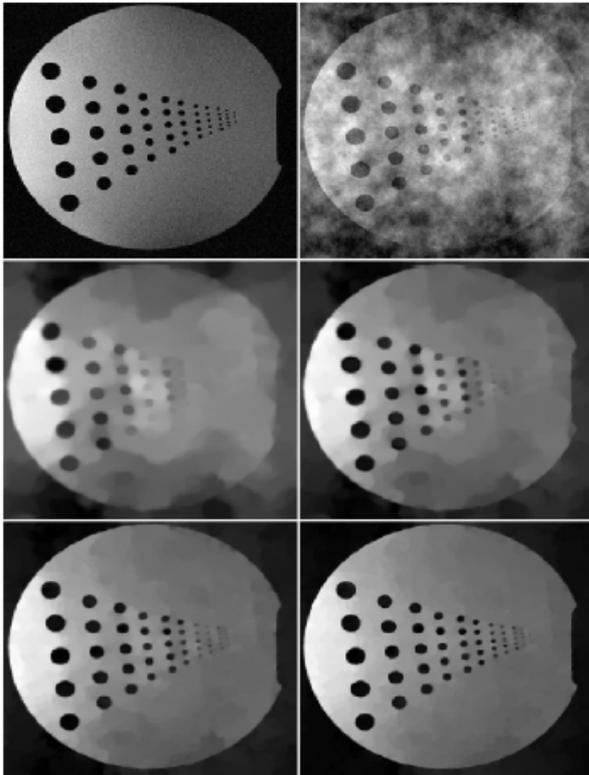
4:30-5:30 p.m., Davis Auditorium, CEPSR (Shapiro Center)

Refreshments served at 4:00 p.m. in 200 SW Mudd



# Stanley Osher

Professor of Mathematics & Director of Applied Mathematics, University of California, Los Angeles



## "What Sparsity and $L^1$ Optimization Can Do for YOU"

Sparsity and compressive sensing have had a tremendous impact in science, technology, medicine, imaging, machine learning and now, in solving multiscale problems in applied partial differential equations, developing sparse bases for Elliptic eigenspaces and connections with viscosity solutions to Hamilton-Jacobi equations.  $L^1$  and related optimization solvers are a key tool in this area. The special nature of this functional allows for very fast solvers:  $L^1$  actually forgives and forgets errors in Bregman iterative methods. I will describe simple, fast algorithms and new applications ranging from sparse dynamics for PDEs, new regularization paths for logistic regression and support vector machines to optimal data collection and hyperspectral image processing.

Image: Split Bregman compressed sensing reconstruction of MR image.

Stan Osher has made seminal contributions to Applied Mathematics, Computational Science and Scientific Computing. These range from shock-wave capturing techniques used in supersonic flow around aircraft to level set and PDE-based methods in computer vision and image processing, which have been applied to video image enhancement and movie animation. Osher is a member of the US National Academy of Sciences and the American Academy of Arts and Sciences, a SIAM Fellow and a Fellow of the AMS. Osher has given the John von Neumann Lecture of SIAM (2013) and a Plenary Lecture at the International Congress of Mathematicians (ICM-2010). He holds honorary doctoral degrees from Ecole Normale Supérieure - Cachan, France and Hong Kong Baptist University.

Organizing Committee: D. Goldfarb (IEOR), E. Grinspun (Computer Science & APAM), I. Karatzas (Mathematics), and M.I. Weinstein (APAM & Mathematics)

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