

# Daniel N. Kaslovsky

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## Research Interests

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High-dimensional data analysis and geometry, manifold learning, sparse representation and adaptive decompositions, compressive sensing, computational imaging and image processing, machine learning, computational harmonic analysis, and fast randomized algorithms.

## Education

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05/2012 (expected)	Ph.D.	Applied Mathematics	University of Colorado, Boulder
12/2009	M.S.	Applied Mathematics	University of Colorado, Boulder
05/2003	B.A.	Computer Science	Colgate University

Doctoral Advisor: François G. Meyer

Thesis Committee: Gregory Beylkin, James Curry, Thomas Manteuffel, Per-Gunnar Martinsson, François Meyer, Amit Singer (Princeton University)

## Relevant Experience

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Fall 2008 - **Research Assistant**  
Present **Department of Applied Mathematics**

*Advisor: François G. Meyer*

- Geometric approaches for high dimensional data analysis
- Incorporating fast randomized algorithms from numerical linear algebra with spectral methods for manifold learning (co-advised by Gunnar Martinsson)
- Nonstationary data analysis with Empirical Mode Decomposition and applications to sleep EEG analysis

Fall 2008 - **NSF IGERT Fellow**  
Present **Computational Optical Sensing and Imaging** (<http://cosi.colorado.edu/>)

- Training in computational imaging through coursework, seminars, and focused research

Summer 2010 **Graduate Research Assistant**  
**Los Alamos National Laboratory, T5 Division: Applied Mathematics and Plasma Physics**  
◦ Local manifold geometry for image processing and sparse representation

## Publications

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1. **Kaslovsky, D.N.**, Chinoy, E.D., Wright Jr., K.P., and Meyer, F.G. "Novel Sleep EEG Analysis with Empirical Mode Decomposition," *In preparation*, 2011.
2. **Kaslovsky, D.N.** and Meyer, F.G. "Optimal Tangent Plane Recovery from Noisy Manifold Samples." *Submitted to Annals of Statistics* (57 pgs). <http://arxiv.org/abs/1111.4601>.
3. **Kaslovsky, D.N.** and Meyer, F.G. "Noise Corruption of Empirical Mode Decomposition and its Effect on Instantaneous Frequency." *Advances in Adaptive Data Analysis*, 2(3), pp. 373–396, 2010.

## Invited Conference Presentations

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1. Meyer, F.G., **Kaslovsky, D.N.**, and Wohlberg, B. "Analysis of Image Patches: a Unified Geometric Perspective," *SIAM Conference on Imaging Science*, Philadelphia, PA, May 2012.
2. **Kaslovsky, D.N.** and Meyer, F.G. "Image Manifolds: Processing Along the Tangent Plane," *International Congress on Industrial and Applied Mathematics (ICIAM)*, Vancouver, BC, July 2011.

## Conference Presentations

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1. **Kaslovsky, D.N.** and Meyer, F.G. "Geometric Image Processing: A Local Approach," *SIAM Front Range Applied Mathematics Student Conference*, Denver, CO, March 2011.
2. **Kaslovsky, D.N.** and Meyer, F.G. "The Deluge of Images and Videos: Understanding the Manifold of Image Patches with Randomized Techniques" (poster), *Colorado Photonics Industry Association Annual Meeting*, Boulder, CO, November 2010.
3. **Kaslovsky, D.N.** and Meyer, F.G. "The Deluge of Images and Videos: Understanding the Manifold of Image Patches with Randomized Techniques" (poster), *NSF IGERT Project Meeting*, Washington, DC, May 2010.
4. Meyer, F.G., Taylor, K.M., **Kaslovsky, D.N.**, Procopio, M.J., and Young, C.J. "Evaluation of Empirical Mode Decomposition and Chirplet Transform for Regional Seismic Phase Detection and Identification," *Seismological Society of America Annual Meeting*, Monterey, CA, April 9, 2009.
5. **Kaslovsky, D.N.** and Meyer, F.G. "Performance of Empirical Mode Decomposition on Noisy Data." *SIAM Front Range Applied Mathematics Student Conference*, Denver, CO, March 2009.

## Peer-Reviewed Abstracts

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1. Chinoy, E.D., **Kaslovsky, D.N.**, Meyer, F.G., and Wright Jr., K.P. "Analysis of the Sleep EEG with the Novel Signal Analysis Technique Empirical Mode Decomposition as Compared to Spectral Analysis." *Submitted to SLEEP 2012*, Boston MA.
2. Chinoy, E.D., **Kaslovsky, D.N.**, Meyer, F.G., and Wright Jr., K.P. "Changes in EEG Frequency Bands across the Sleep Transition Comparing Older and Young Adults as Measured by the Novel Signal Analysis Technique Empirical Mode Decomposition," *Submitted to SLEEP 2012*, Boston MA.

## Invited Seminars

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1. "Optimal Tangent Plane Recovery from Noisy Manifold Samples," *IDeAS Seminar, Program in Applied and Computational Mathematics, Princeton University*, September 2011.
2. "Geometric Image Processing," *Computational Optical Sensing and Imaging (COSI) Seminar, University of Colorado, Boulder*, February 2011.
3. "Uncovering Local Manifold Geometry and Processing Large Data Sets," *Computational Mathematics Seminar, Dept. of Applied Mathematics, University of Colorado, Boulder*, December 2010.
4. "Uncovering Local Manifold Geometry and Processing Large Data Sets," *Dynamics/Complex Systems Seminar, Dept. of Applied Mathematics, University of Colorado, Boulder*, December 2010.
5. "Local Manifold Geometry for Processing Large Data Sets," *SIAM Graduate Chapter Meeting, University of Colorado, Boulder* October 2010.

## Involvement, Service, and Honors

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October 2011	Institute for Mathematics and its Applications (IMA) Visitor Accepted with funding to IMA workshop "Large Graphs: Modeling, Algorithms and Applications"
Fall 2011	Referee SIAM Undergraduate Research Online
March 2011	SIAM Travel Award Grant (\$1,500) for ICIAM 2011 conference presentation
Spring 2008 - Spring 2010	President SIAM Graduate Chapter, University of Colorado
March 2009 & March 2010	Organizer Front Range Applied Mathematics Student Conference
Spring 2009 & Spring 2010	Certificate of Recognition SIAM Chapter Award
Spring 2010	Invited Member Department of Applied Mathematics Course Fees Committee
July 2009	Chapter Representative 2009 SIAM Annual Meeting
Jan. 2008 & Jan. 2010	Volunteer Judge Peak-to-Peak Charter School Science Fair
2007 - Present	Member Society for Industrial and Applied Mathematics

## Coursework

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Applied Analysis 1 & 2, Numerical Analysis 1 & 2, Partial Differential and Integral Equations, Wavelets and Imaging, Approximation Methods, Imaging Systems, Analysis of High Dimensional Datasets, Computational Optical Imaging Laboratory, Mathematical Statistics (audited), Fast Methods in Scientific Computing (audited), Teaching Excellence Seminar, Complex Networks Seminar, Computational Optical Imaging Seminar

Current Status: Ph.D. candidate, post preliminary exams, post comprehensive exam

## Teaching

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Teaching Assistant in Department of Applied Mathematics for the following courses:

Fall 2008	APPM2360 Differential Equations with Linear Algebra
Fall 2008	APPM2460 Differential Equations Lab
Summer 2008	APPM2350 Calculus III for Engineers
Spring 2008	APPM1350 Calculus I for Engineers
Fall 2007	APPM2350 Calculus III for Engineers

## Miscellaneous

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*Additional Education:*  
*Citizenship:*

M.E.S.S., Sports Management, University of Florida, 2004.  
United States

Last updated: December 21, 2011