CSGB
CENTRE FOR **STOCHASTIC GEOMETRY**
AND ADVANCED **BIOIMAGING**

Workshop on Geometry and Statistics in Bioimaging:
Manifolds and Stratified Spaces

8-12 October 2012, Sandbjerg Estate, Sønderborg, Denmark

Scope of the workshop: This workshop is dedicated to geometric and statistical modeling in biomedical image analysis. The workshop is a result of our desire to bring together researchers from biomedical image analysis, who have an interest in the underlying mathematical constructions, along with mathematicians who have an interest in the underlying practical problems.

Traditional statistical methods analyze data in linear, Euclidean spaces. In many bioimaging problems, however, data is best described in non-Euclidean spaces. Some types of imaging data, such as 2-dimensional shapes, are naturally modeled on manifolds. However, even basic statistical notions such as PCA do not have an obvious well-defined translation into the manifold world. Even more complicated data spaces are needed to describe shapes from 3-dimensional images, which are now standard in bioimaging. Spaces of 3-dimensional shapes are not manifolds, but singular, stratified group quotients, where statistical measurements are not obviously well defined or computable. The class of stratified spaces also contains spaces of graphs and trees, which receive a growing interest in medical image analysis, where graphs and trees actually appear, e.g., as blood vessel networks, airway trees or dendrite trees. The goal of the workshop is to study how geometry affects statistics in these nonlinear data spaces.

Participation: Due to a restricted number of places, this workshop is in principle "by invitation only". However, there are a few free places. For further information, please contact Oddbjørg Wethelund (oddbjorg@imf.au.dk).

Invited speakers:

Alfred Bruckstein, Technion - Israel Institute of Technology

James Damon, University of North Carolina, Chapel Hill

Herbert Edelsbrunner, Duke University and Institute of Science and Technology Austria

Stephan Huckemann, Universität Göttingen

Sarang Joshi, University of Utah

Steve Marron, University of North Carolina

Peter W. Michor, Universität Wien

Ezra Miller, Duke University

David Mumford, Brown University

Megan Owen, University of Waterloo

Xavier Pennec, INRIA Sophia Antipolis

Steven W. Zucker, Yale University

Scientific programme committee:

Andrew du Plessis, Aarhus

Aasa Feragen, Copenhagen

Eva B. Vedel Jensen, Aarhus

Francois Lauze, Copenhagen

Mads Nielsen, Copenhagen

Local organizing committee:

Camilla Jørgensen, Copenhagen

Oddbjørg Wethelund, Aarhus

For further information, please see the homepage:
www.csgb.dk