Abstrakt:
Our notion of what constitutes an “image” and how we can analyze the objects in an image has undergone considerable evolution since the beginnings of computer imaging. Computer images no longer consist solely of still 2-dimensional images. For example, “natural images” are 2-dimensional images of real world scenes while medical images may be 2 or 3-dimensional images created by various imaging methodology or “images” may consist of time varying families of images. Ultimately algorithms which are applied to analyze these computer images are based on underlying theoretical mathematical results. We give an overview of several of these imaging problems and the mathematical results used in solving them. The mathematical results are based on a combination of geometry and analytic results combined with methods from singularity theory.