1067-65-1197   **Thomas Fidler*** (`thomas.fidler@univie.ac.at`), Computational Science Center, Nordbergstrasse 15, 1090 Vienna, 1090 Vienna, Austria. *Shape Reconstruction based on Integral Invariants: Theory and Applications.*

In this talk we introduce integral invariants, which can be seen as the canonical counterpart of the well known differential invariants. We highlight the advantages of the integral representation and focus on the mathematical theoretical challenges encountered in the problem of shape reconstruction. As a reasonable application we consider the problem of reconstructing a shape from its Radon transform in limited directions. Since the set of directions where data is available is insufficient for an exact reconstruction we have to incorporate some a-priori information to stabilize the reconstruction process. We formulate the problem as a minimization problem and propose to use a regularization functional based on integral invariants which encodes the a-priori information, e.g. curvature, in a stable way. (Received September 20, 2010)