

## EINDHOVEN MATHEMATICS COLLOQUIUMS

JOOST BATENBURG (CWI AND UNIVERSITY OF ANTWERP):  
LIMITED DATA PROBLEMS IN TOMOGRAPHY

DIAMANT LECTURE ROOM (HG 9.41)  
4 JANUARY 2012, 15:30-16:30

Tomography is a powerful technique for revealing the interior of an object without taking it apart. Based on a series of projection images, taken from a range of angles, a three-dimensional image of the object is computed by a reconstruction algorithm. This talk deals with the problem of image reconstruction from severely limited data, where traditional algorithms are useless. Various strategies will be discussed for solving these highly underdetermined inverse problems, ranging from introducing various types of prior knowledge about the object as constraints, to actually modifying the tomographic experiment itself, in a way that makes the solution better determined. Computable error bounds will be discussed, which bound the reconstruction error with respect to the unknown original object.