FACULTAD DE CIENCIAS
FÍSICAS Y MATEMÁTICAS
UNIVERSIDAD DE CHILE

CMM
Center for
Mathematical
Modeling

cmm.uchile.cl

Beauchef 851, edificio norte, piso 7
Santiago, CHILE
CP 837 0456

tel +56 2 2978 4870

SEMINARIO CMM-MINERIA

Speaker: Hang Si, Weierstrass Institute (WIAS), Berlin

Title: An Introduction to Unstructured Mesh Generation and Adaptation

Abstract: Analytic solutions for most PDEs are known only for some simple domains, such as a circle, square, or sphere. In order to obtain solutions for more realistic domains, numerical approximations such as the finite element method (FEM) and finite volume methods (FVM) are used. Mesh generation is a key step prior to these numerical methods. It is itself an active research topic with background in mathematics, computer science, and engineering. Apart from numerical solution of PDEs, its applications are numerous and have practical uses in fields such as archaeology, cinematography and robotics.

In this talk, we will begin with triangle mesh generation and adaptation in the plane. This problem has been well studied. Efficient algorithms are developed. We will then move to tetrahedral mesh generation in 3d, which is still challenged by many theoretical and practical issues. The introduced algorithms as well as examples will be demonstrated using two open source codes: Detri2 and TetGen, which are under developing by the author.

Short Bio:

Hang Si is employed by Weierstrass Institute (WIAS) in Berlin. His main research is mesh generation and the discrete and
computational geometry problems behind it. The goal is to develop efficient algorithms for automatically generating tetrahedral meshes
suitable for numerical methods such as finite element and finite volume methods. He developed the software, TetGen, a Delaunay
tetrahedral mesh generator. It is freely available for academic use (http://www.tetgen.org).

Hang Si got his B.S. in Electrical Engineering in Hangzhou University (now merged in Zhejiang University) in 1994, and got his M.S. in
Computer Science in Zhejiang University in 2002. He joined the research group "Numerical Mathematics and Scientific Computing" of
WIAS in 2002. He received his Ph.D from the Institute of Mathematics of Technische Universitaet Berlin in 2008.

CONICYT
Ministerio de Educación
Gobierno de Chile

cnrs