

**The Hong Kong Polytechnic University
Department of Applied Mathematics**

Colloquium

Parametric finite element methods for curvature driven interface evolution

By

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Abstract

Parametric finite elements lead to very efficient numerical methods for surface evolution equations. We introduce several computational techniques for curvature driven evolution equations based on a weak formulation for the mean curvature. The approaches discussed, in contrast to many other methods, have good mesh properties that avoid mesh coalescence and very nonuniform meshes. Mean curvature flow, surface diffusion, anisotropic geometric flows, Willmore flow as well as free boundary problems are treated. We show stability results as well as results explaining the good mesh properties.

Bibliography

Prof. Harald Garcke received his PhD degree from University of Bonn in 1993, and he obtained his Habilitation at University of Bonn in 2000. Since 2002, he is a Full Professor at University of Regensburg. Prof. Garcke's research interests include the analysis and computation for geometric evolution equations, fluidic membranes, snow crystal growth, image segmentation, shape optimization, phase field modelling of solidification phenomena, tumor growth, and so on.

Date: 10 May 2021 (Monday)

Time: 15:00-16:00 (Hong Kong Standard Time GMT +8)

Venue: Online Talk via Zoom (Meeting ID: 978 9712 9331)

Speaker: Prof. Harald Garcke, University of Regensburg

Host: Dr. Buyang Li, The Hong Kong Polytechnic University

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