

**The Department of  
Mathematical Sciences  
Welcomes**

**2022 Taft Lecturer**

**Dr. David Chopp**

**Professor**

**Department of Engineering Sciences and  
Applied Mathematics  
Northwestern University**



**Thursday, November 10th, 2022**

**Swift Hall Room 800**

**3:45-4:45 pm**

**Modeling bacterial biofilms using the level set method.**

Level set methods have developed into a powerful tool for computing solutions to moving interface problems of all types. In this talk, I will give a brief introduction to the level set method followed by a few examples of how it has been applied to simulating bacterial biofilm models including cell-to-cell signaling by *Pseudomonas aeruginosa*, microbial fuel cells using *Geobacter sulfurreducens*, and coordination of nutrient utilization by *Bacillus subtilis* biofilms. I will focus on how the level set method is used for each of these models as well as discuss the unique biological insights we were able to gain by utilizing the mathematical models.

**Refreshments will be served 2:45-3:20 pm in the Math Faculty &  
Graduate Student Lounge Room 4118 French Hall West**