

# Spring 2019 Undergraduate Seminar

Department of Mathematics



## How to turn a sphere inside out

### Dr. Tom Hales

Mellon Professor, University of Pittsburgh

**Date:** Tuesday, April 2

**Time:** 12:00 - 12:50 pm

**Location:** Room 703, Thackeray Hall

Tom Hales is the Mellon Professor of Mathematics at the University of Pittsburgh. He received B.S. and M.S. degrees from Stanford University, a Tripos Part III from Cambridge University, and a Ph.D. from Princeton University in representation theory under R. P. Langlands. He has held postdoctoral and faculty appointments at MSRI, Harvard University, the University of Chicago, the Institute for Advanced Study, and the University of Michigan. In 1998, Hales, with the help of his graduate student Samuel Ferguson, proved Kepler's 1611 conjecture (and part of Hilbert's 18th problem) on the most efficient way to stack oranges. In 2014, he and his coworkers gave a formal proof of the Kepler conjecture in the computer proof assistant "HOL Light." Hales has received the Chauvenet Prize of the MAA (2003), the Moore Prize (2004), the Robbins Prize of the AMS (2007), the Lester Ford Prize of the MAA (2008), the Fulkerson Prize of the MPS and AMS (2009) and is an inaugural Fellow of the AMS (2012). His current project is "Formal Abstracts in Mathematics" which will transform mathematical statements from journal articles into a form that can be processed and manipulated by formal proof systems.



When a young mathematician told his advisor that he had found a way to turn a sphere inside out (without making any creases), his advisor told him that this was impossible to do so, and gave him a proof.

His advisor was wrong. That young mathematician (Smale) went on to win the highest mathematical prize (the Fields Medal).

His solution is very non-intuitive. Today, there are several excellent videos on YouTube that show how to turn a sphere inside out, and this talk will explain some of them. Food and drinks will be provided!

### SPEAKER(S) FOR NEXT WEEK:

Dr. Kiumars Kaveh



Organized by: Derek Orr, Tom Everest, Jeremiah Morgan, and Jeff Wheeler