2013 MICHALIK LECTURE

Frank Morgan studies optimal shapes and minimal surfaces. He has published over 150 articles and six books, including "Calculus" and "The Math Chat Book," based on his live, call-in TV show and column. He now has a blog at the Huffington Post. Founder of the NSF "SMALL" Undergraduate Research Project, inaugural winner of the Haimo national teaching award, past vice-president of the MAA and of the AMS, he is Atwell Professor of Mathematics at Williams College.

4:00 P.M.
Friday,
March 22, 2013

Ballroom B,
University Club
at the University of Pittsburgh

Free and Open
to the Public

UNIVERSITY OF PITTSBURGH
The DIETRICH School of
Arts & Sciences

The University of Pittsburgh
Department of Mathematics

Presents

The Edmund R. Michalik
Distinguished Lecture in the
Mathematical Sciences

Prof. Frank Morgan

Atwell Professor of Mathematics, Williams College

Soap Bubbles, Tilings, and Other Partitioning Problems

Abstract: The Ancient Greeks proved that the circle is the least-perimeter way to enclose given area. Similarly the round soap bubble provides the least-perimeter way to enclose a given volume of air, although that was not proved until 1884 by Schwarz. Similarly the double bubble that forms when two soap bubbles come together is the least-perimeter way to enclose and separate two given volumes of air, although that wasn't proved until 2000 by Hutchings, Morgan, Ritoré, and Ros. Lord Kelvin sought the least-perimeter way to divide all of space into unit volumes, and his conjecture stood for 100 years, until Weaire and Phelan found a better way in 1994. Whether their new candidate is best remains open today. Even the least-perimeter way to divide the plane into unit areas, using the bees' hexagonal honeycomb tiling, though conjectured by the Ancient Greeks, was not proven until 1999 by Hales. The most efficient tiling by pentagons remains open. In many simple non-Euclidean possible universes, even the ideal shape for a single soap bubble remains open.

Reception Immediately
Following the Lecture

This public lecture is part of an annual series in honor of Professor Edmund R. Michalik, established through a gift from the Michalik family.

For further information, email: **math@pitt.edu**
Phone: **412-624-8375**
or visit **http://www.mathematics.pitt.edu**