

Mathematics and Soap Films

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007 Kemeny Hall, 4:00 pm
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Abstract

Why do one-celled creatures take the shapes they do? Why do red-blood cells have their characteristic shape? Why does the fundamental formula for soap films occur in respiratory therapy textbooks? More and more, in biology as well as other sciences, the notion of "shape" is proving to be important in creating mathematical models. Mathematicians have ways of measuring shape and of determining shape through optimization. This fits well with Nature's penchant for economy, so it isn't surprising (in retrospect) that soap films, which arise from surface tension's ability to shrink surface area, are a kind of analog computer for the mathematics of minimizing surface area. This talk will consist of three parts: soap film demonstrations (which will set the stage for); a bit of mathematics and; computer experimentation and illustration. This talk is suitable for all science majors (and beyond!). Since audience participation is required for soap film experiments, attendees are encouraged not to wear their best attire!