



The Math Colloquium
Department of Mathematics
San José State University



Robert A. Marks
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*Effects of Phase Fraction on
Equilibrium Phase Morphologies*

MAY 9, 2012, MH320

Abstract: For a simple fluid, surface tension is invariant with respect to direction (isotropic), and the arrangement of chemical phases is easily predicted by balancing surface tensions where multiple surfaces intersect. For crystalline solids, surface tensions are anisotropic, so a unique configuration of the phases cannot be predicted by this method alone. Instead, one must minimize the total surface energy of the system subject to the constraints that the volume of each chemical phase is conserved. Consequently, the relative amounts of the chemical phases in the system, or *phase fractions*, play a significant role in determining the equilibrium arrangement.

Background: Multivariable calculus (Math 32).

About the speaker: Robert Marks earned his Ph.D. in materials science and engineering from U.C. Berkeley in 2003 and currently teaches in the Department of Mechanical Engineering at Santa Clara University. He has recently published two articles on the topic of this presentation in *Acta Materialia*.

SNACKS IN MH331B AT 2:30 PM

TALK STARTS AT 3 PM

For more information, see our full schedule at:

<http://www.math.sjsu.edu/~hsu/colloq/>