



The Math Colloquium
Department of Mathematics
San José State University



Roger Dodd

SJSU

Integrable equations and affine Lie algebras

NOVEMBER 10, 2010, MH320

Abstract: In the late 1960's, certain physically important nonlinear partial differential equations were solved by analyzing associated linear problems. One key feature of this work was the discovery that special classes of solutions could be obtained from a *Hirota equation* associated with the PDE, and that the Hirota equation can be interpreted in terms of the representation theory of what are known as *affine Lie algebras*.

In this talk I will discuss this work and describe the affine Lie algebra \mathfrak{a}_∞ , whose representation theory yields the Hirota equation of the Kadomtsev-Petviashvili equation (which governs shallow water waves). I will also present connections with classical geometry.

Background: First courses in differential equations, linear algebra, and abstract algebra.

About the speaker: Roger Dodd received his Ph. D. from Hull University, England. He is a Fellow of Trinity College, Ireland, and a professor in the math department at SJSU. Current research interests include the classification of integrable equations through the representation theory of affine Lie algebras.

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/>