

**Meeting:** 1006, Lubbock, Texas, SS 2A, Special Session on Differential Geometry and Its Applications

1006-53-119      **Emma Carberry\*** (carberry@math.mit.edu), 2-167 Department of Mathematics, Massachusetts Institute of Technology, Cambridge, MA 02139, and **Ian McIntosh** and **Erxiao Wang**.  
*Harmonic maps from the plane to Lie groups and symmetric spaces.* Preliminary report.

Harmonic maps from the plane to a compact Lie group or symmetric space form an integrable system, and many such maps can be described in terms of a linear flow on an associated torus  $\mathbb{C}^g/\Lambda$ . This torus is the Jacobian of an algebraic curve  $X$ , called the spectral curve. This point of view introduces an important invariant of the harmonic map, namely its spectral genus  $g = \text{genus}(X)$ . The spectral genus gives the dimension of the space of deformations of the harmonic map, and in some geometrically interesting cases provides a lower bound for its energy. We shall describe how, in several situations, studying the spectral genus has led to the proof of the existence of arbitrarily large families of minimal 2-tori. In particular, we shall describe some such work of relevance to mirror symmetry and to M-theory. (Received February 10, 2005)