1078-35-132 **Robert Marangell*** (r.marangell@sydney.edu.au), School of Mathematics and Statistics F07, University of Sydney , NSW 2006, Australia, Sydney, NSW 2006, Australia, and **C.K.R.T. Jones**, **P. Miller** and **R. Plaza**. *The spectrum of periodic traveling waves in the sine-Gordon equation.*

Traveling wave solutions to the sine-Gordon equation can be organized according to their speed (sub or superluminal), and the phase plane of the pendulum equation. From this one can obtain four cases for which the linearized sine-Gordon operator is spatially periodic. Determining linearized stability then amounts to finding special solutions to a Hill's equation. In this talk, I will relate the spectrum of the linearized sine-Gordon operator to said Hill's equation, and use the prevailing Hill's equation theory to establish the linearized stability or instability of each case. (Received December 01, 2011)