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Matthew Pennybacker* (pennybacker@math.arizona.edu), 617 N. Santa Rita Ave., P.O. Box 210089, Tucson, AZ 85721-0089, and **Alan C Newell**. *Nonlinear Fronts in the Swift-Hohenberg Equation as a Model for Phyllotaxis*.

Phyllotaxis, or the regular arrangement of plant structures, is among the most striking of natural phenomena. Perhaps the best example of this is found among the seeds on the head of a sunflower. Counting the number of spirals in the clockwise and counter-clockwise directions at the outer edge of the head often yields two consecutive members of the Fibonacci sequence, and moving inward, a transition to smaller Fibonacci numbers.

We have recently developed a model for phyllotaxis based on the Swift-Hohenberg equation, a PDE describing a broad class of pattern-forming systems. In this work, we demonstrate how phyllotactic patterns may be realized as a nonlinear pushed front solution to this model, including the transition rule that results in the Fibonacci sequence, and compare our results to those of previous geometric and discrete models of phyllotaxis. (Received September 25, 2012)