1079-31-400 **Charles Z. Martin*** (cmart07@math.ucsb.edu). *Elliptic Growth and Variation of the Green Function.*

An elliptic growth process associated to a differential operator L is one wherein a domain in $\mathbb{C}$ grows due to outward pressure from its own Green function (associated to L). A natural inverse problem arises: given a 'movie' of a domain growing, is there an operator L for which the process is driven by elliptic growth? The Green function has a complex dependence upon its underlying domain and differential operator. A well-known formula due to Hadamard gives the first variation in the Green function when the domain is perturbed. In the same spirit, we can develop a first variation when the underlying operator—the Laplacian—is perturbed into a Schrödinger operator with a small potential. With formula in hand we can begin to study the inverse problem of elliptic growth. (Received January 18, 2012)