1051-58-173 **Christine M Guenther*** (guenther@pacificu.edu), Department of Mathematics and Computer Scienc, 2043 College Way, Pacific University, Forest Grove, OR 97116. *Some preliminary results on the second order renormalization group flow.* Preliminary report.

The geometric evolution equation

$$\frac{\partial g}{\partial t} = -2Rc - \frac{\alpha}{2}Rm^2$$

arises as the second order renormalization group flow of quantum field theory. (Here g is a Riemannian metric, Rc is the Ricci curvature tensor, $Rm_{ij} = g^{rs}g^{mn}g^{kl}R_{irmk}R_{jsnl}$, and $\alpha << 1$ is a parameter.) It has been of interest to physicists, but as yet little is known about it mathematically. In this talk we will present a basic introduction to the equation, and some preliminary results obtained by geometric analytical methods. (Received August 24, 2009)