1067-53-1232   **Donovan C McFeron*** (`dmcferon@ramapo.edu`), Ramapo College of New Jersey, 505 Ramapo Valley Rd, Mahwah, NJ 07430. *Remarks on some Non-Linear Heat Flows in Kähler Geometry.*

In this talk, we clarify or simplify certain aspects of the Calabi flow and of the Donaldson heat flow.

In particular, in 2002, Struwe studies the Calabi flow as a flow of conformal factors $g_{ij}(t) \equiv e^{2u(t)}\hat{g}_{ij}(0)$,

$$\dot{u}(t) = \frac{1}{2}\Delta R \tag{1}$$

and the convergence of the conformal factors $u(t)$ in the Sobolev norm $\| \cdot \|_{(2)}$ is obtained. Although the convergence of the conformal factors established by Struwe is only in the $\| \cdot \|_{(2)}$ norm, he states clearly that the convergence in arbitrary Sobolev norms, and hence in C^∞, should follow in the same way. In the first part of this talk, we confirm that this is indeed the case.

Next we discuss the Donaldson heat flow. We shall show directly the C^0 boundedness of the full curvature tensor $F_{\bar{k}j}{}^\alpha{}_\beta$ on $[0, \infty)$. Once again, our main technique is differential inequalities for the L^2 norms of the derivatives of $F_{\bar{k}j}{}^\alpha{}_\beta$, in analogy with the methods of Phong-Sturm, Szekelyhidi and the treatment of the Calabi flow that we used in the previous section. (Received September 20, 2010)