1163-53-503 **Samuel Pérez-Ayala*** (sperezay@nd.edu). *Maximal Metrics for the Conformal Laplacian.*

Let (M^n, g) be a closed Riemannian manifold of dimension $n \geq 3$. Assume $[g]$ is a conformal class for which the Conformal Laplacian $L_g := -\Delta_g + c_n R_g$ has at least two negative eigenvalues and $0 \notin \mathrm{Spec}(L_g)$. If we define $\Lambda_2(M^n, [g])$ as the supremum of the second eigenvalue over generalized conformal metrics with unit volume, then we show that there is a nonnegative and nontrivial function $\bar{u} \in C^\alpha(M^n) \cap C^\infty(M^n \setminus \{\bar{u} = 0\})$, $\alpha \in (0,1)$, such that "$g_{\bar{u}} = \bar{u}^{\frac{4}{n-2}} g$" attains this supremum. As an application, and depending on the multiplicity of $\lambda_2(\bar{u})$, we find either nodal solutions to a Yamabe type equation, or a harmonic map into a sphere. (Received September 08, 2020)