1147-58-238 **Xavier Ramos Olive***, xramo002@ucr.edu, and **Shoo Seto**, **Guofang Wei** and **Qi S. Zhang**.

Zhong-Yang type eigenvalue estimate with integral curvature condition.

One trend in Riemannian geometry since the 1950's has been the study of how curvature affects global quantities, like the eigenvalues of the Laplacian. On a closed manifold with nonnegative Ricci curvature and diameter bounded above by D, Zhong and Yang proved that the first eigenvalue λ_1 of the Laplace-Beltrami operator satisfies

$$\lambda_1 \geq \frac{\pi^2}{D^2}.$$

This lower bound is sharp, since equality holds for the circle. In this talk we will present a corresponding estimate for closed manifolds for which the negative part of the Ricci curvature is small in an integral sense. This is a much weaker assumption than a pointwise lower bound. The result recovers the one from Zhong and Yang when Ricci is nonnegative, and is in this sense sharp.

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