

# EXISTENCE OF METRICS MAXIMIZING THE FIRST EIGENVALUE ON CLOSED SURFACES

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ABSTRACT. We prove that for closed surfaces of fixed topological type, orientable or non-orientable, there exists a unit volume metric, smooth away from finitely many conical singularities, that maximizes the first eigenvalue of the Laplace operator among all unit volume metrics. The key ingredient are several monotonicity results, which have partially been conjectured to hold before. This is joint work with Henrik Matthiesen.