**The Final Step in the Remarkable Journey of the Isoperimetric Problem: The Completion of Euler’s Approach**

**Abstract:**

In this presentation we give a brief overview of the remarkable life of the impactful isoperimetric problem. We identify three distinct classes of solution approaches that have been used throughout history: the Cartesian coordinate representation approach of Euler, the synthetic geometry approach of Steiner, and the parametric representation approach of Weierstrass. We say that one of our three classes of approaches has been completed when an appropriately short sufficiency proof for the isoperimetric problem has been constructed that belongs to this class of proofs. In a legendary work from 1744, Euler presented his contribution, establishing neither necessity nor sufficiency for this problem. This failure led Steiner in 1838 to propose his approach that gave only necessity and not sufficiency as he believed. The Steiner path was completed by Lawlor in 1998. Euler’s and Steiner’s failures led Weierstrass in 1879 to propose his approach, which did indeed lead to sufficiency but required a somewhat elaborate theory. The Weierstrass approach was completed in 1934 by Littlewood, Hardy, and Polya. The major contribution in this presentation is our completion of Euler’s approach. Our proof uses elementary tools.