CCSU
DEPARTMENT OF MATHEMATICAL SCIENCES
COLLOQUIUM

Friday, April 13
3:00 – 4:00 PM
Maria Sanford, Room 101

NEWMAN'S DEFINITION OF SIMPLY-CONNECTED REGIONS AND HIS SIMPLE PROOF OF CAUCHY'S CLOSED CURVE THEOREM

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Abstract: In Chapter 8 of Newman and Bak's textbook Complex Analysis, an alternative definition of simply-connected open plane regions is used for a simple proof of Cauchy's Closed Curve Theorem. An open plane region is (Newman) simply-connected if its complement is "path connected within ε to infinity". We will: **1.** Comment on the history and proofs of Cauchy's Closed Curve Theorem; **2.** Discuss Newman's simple proof, utilizing his definition of simply connected plane regions, in his textbook with Prof. Bak; and **3.** Sketch our proof that Newman's definition (when applied to open regions) is equivalent to the usual ones, thereby completing and justifying his original approach.

This talk is based on joint work with Prof. Joseph Bak of the City College, CUNY, published in the paper *The Evolution of Cauchy's Closed Curve Theorem and Newman's Simple Proof*, The American Mathematical Monthly **124** (2017), No.3, pp. 217-231.

In Prof. Bak's words, the late Prof. Donald Newman "believed that all beautiful theorems should have equally beautiful proofs and, in many cases, he provided his own."

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