

CCSU
DEPARTMENT OF MATHEMATICAL SCIENCES

COLLOQUIUM

Friday, September 3

3:00 – 4:00 PM

Maria Sanford, Room 101

DIMENSIONAL ANALYSIS AND FLUID MECHANICS

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Abstract: My father was a civil engineer who worked designing highways for the Illinois Department of Transportation (IDOT), and this talk is given in his memory. After introducing the idea of base units of measurement (such as the SI units of meter, kilogram, and second), a simple example of projectile motion is used to explain what the Buckingham π theorem is and how it is useful in applications. This mathematical result shows the importance of dimensionless quantities, which are ratios of variables and parameters where all the units cancel out. For example, in fluid mechanics, Reynolds number has no units and is used to distinguish between laminar and turbulent flow. Finally, three examples of fluid flowing downhill will be considered: water in an aqueduct, rain runoff from a highway, and currents in the world's oceans. This talk will be understandable to anyone who has taken calculus, so I encourage undergraduates to come and see how mathematical ideas can be used in the real world.

For further information:

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<http://www.math.ccsu.edu/gotchev/colloquium/>