UNIVERSITY of WISCONSIN
UW**MILWAUKEE**

Department of
Mathematical Sciences

Colloquium
Dr. Martin Bridgeman

Professor of Mathematics

Boston College

**Friday,
October 14th, 2022
@ 2:00pm**

EMS Building, E495

Dr. Martin Bridgeman

**UW-Milwaukee
Department of
Mathematical Sciences**

**EMS Building, Room E403
3200 North Cramer Street
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Schwarzian derivatives, projective structures, and the Weil-Petersson gradient flow for renormalized volume

Renormalized volume was introduced in work of Graham and Witten in physics to give an alternative notion of volume for conformally compact Einstein manifolds. In the hyperbolic setting, this was described and developed by Takhtajan, Zograf, Teo, Krasnov, and Schlenker and others. The renormalized volume of a hyperbolic manifold M connects many analytic concepts from the deformation theory with the geometry of M and is closely related to classical objects such as the convex core volume and the Weil-Petersson geometry of Teichmuller space. Using the Schwarzian derivative, we will describe how the Weil-Petersson gradient flow of renormalized volume can be used to give a new approach to studying the space of hyperbolic structures on a 3-manifold. In particular we will show that the flow "finds" the hyperbolic manifold with lowest convex core volume and gives new proofs of some classical results from the theory of hyperbolic manifolds.

Refreshments will be served in EMS E495 following this event.

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