# CCSU
## DEPARTMENT OF MATHEMATICAL SCIENCES

# COLLOQUIUM

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3:00 – 4:00 PM
Maria Sanford, Room 101

# HOMOLOGY BASIS OF RIEMANN SURFACES

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**Joint work with Peter Buser, and Bjoern Muetzel**

**Abstract:** The topology of surfaces is simple. For a compact, orientable surface, one invariant is sufficient for classification: the genus. If we are looking for additional algebraic invariants, we can calculate the fundamental group. However, our main interest is the homology, which is easier to calculate and is an Abelian group. For a compact, orientable surface there exists canonical basis which is easy to work with.

Our question is "What can go wrong?"

To our surprise we can construct homology basis such that the complement of basis is disconnected.

We also provide a characterization of all intersection matrices for a homology basis of a compact surface. Furthermore, given an intersection matrix, there is an algorithm to construct a basis using that matrix.