

BI-CO MATHEMATICS COLLOQUIUM

Clay Shonkwiler
University of Pennsylvania

“Linking integrals in hyperspheres”

Monday, March 2, 2009

Talk at 4:15 pm – Park 328
Tea at 3:45 – Park 355, Math Lounge

Abstract:

When two closed curves in space are linked, we can compute their linking number using a geometric integral formula discovered by Gauss. Gauss's linking integral has inspired much of modern geometric topology and been applied to give important insights into natural phenomena like the supercoiling of DNA and the dynamics of plasma flows. When the curves live in the 3-sphere instead of Euclidean 3-space their linking number is still topologically well-defined, but an appropriate analogue of Gauss's integral has only recently been discovered. This talk will discuss the geometry of the 3-sphere and describe an intuitive, geometric approach to defining a Gauss-type linking integral for the 3-sphere which can be generalized to spheres of arbitrary dimension.

BRYN MAWR COLLEGE