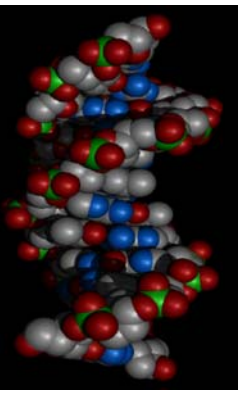
Spring 2008

Math 414-01 / 714-01: Analyzing DNA topology with mathematical and computational methods

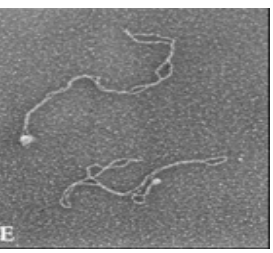
Instructor: Mariel Vazquez; mariel@math.sfsu.edu

T-TH 14:10-15:25; room 211 Thornton Hall

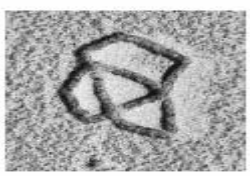
http://math.sfsu.edu/mariel/Math414_714Spring08/



Goal: introduce undergraduate and graduate students from **mathematics, biology, biochemistry, physics, computer science** to common mathematical and computational techniques used in the structural analysis of DNA The course is **highly interdisciplinary.**



- **Atomic and molecular level**: the DNA double helix; Molecular Dynamics algorithms.
- **DNA supercoiling**: DNA as a ribbon; and introduction to differential geometry. **DNA knotting**: DNA as a curve; and introduction to knot theory. Monte Carlo simulations of DNA molecules in solution.



- **Enzymes that change the topology of DNA:** topoisomerases, **site-specific recombinases, and the tangle model.**