

# Welcome to International Group Theory Web Seminar

**Ben Burton,**

***“Fast, faster, fastest: Algorithms in cryptography and bioinformatics”***

**April 15, 12:00pm (New York Time).**

**Abstract:**

In a sequence of zeroes and ones, the density of the sequence describes the relative frequency with which ones occur. Here we consider the problem where, given such a sequence, we must find the longest subsequence whose density matches a given value. This is interesting from a cryptographer's point of view, and also has relevance to the field of bioinformatics.

Our main focus is the algorithmic question of how to find this longest subsequence as quickly as possible. It is simple to build a cubic-time algorithm to solve this problem, and with a little thought this algorithm can be made quadratic. However, further improvements are harder to come by. The goal of this talk is to describe (i) two simple log-linear algorithms based on sorting and maps, followed by (ii) a more complex linear-time algorithm, which achieves the fastest possible time complexity for this problem.

Next presentation:

**April 22. Mark Sapir “TBA”**

