Mathematics 2A Tutorial 4

Lectures on Models of Arithmetic
(for mathematicians, computer scientists, philosophers)
(6207 JCMB, Thursdays 10-11, starting February 7)

Nonstandard models of arithmetic were discovered in the 1930's, and have been studied ever since. Much is known (some very deep, like the Kirby-Paris-Harrington work from the 1970's on independence of combinatorial principles of Ramsey type), but the most convenient text, Kaye's book, is ot of print (now being revised). In the last 20 years one has concentrated on the model theory of weak fragments, because of their direct connection to the heroic questions of computational complexity. This links to proof theory (work initiated by Buss), and to the enterprise of extracting maximal computational information from proofs in number theory.

I intend to cover the main achievements on Peano arithmetic, and then to turn to the model theory of fragments. This should lead to some model theory of finite fields and related structures.

I leave open the option of lecturing twice a week if interest warrants this.

The first lecture will sort out issues of prerequisites, etc. I will be flexible, adapting my choice of topics to the interests of the audience.