1023-D1-1878 **N Jonoska**, FL, **G L McColm**, FL , and **Ana Staninska*** (staninsk@mail.usf.edu), 4202 East Fowler Ave, PHY 114, Tampa, FL 33620. *Designing the right mix for DNA self-assembly.*

Naturally occurring DNA molecules have linear double helix form, but they can be synthesized in many other forms, for example as branched junction molecules that contain free sticky ends (single stranded sequences) on their branches. Due to the natural Watson-Crick mechanism, these molecules can self-assemble into more complex structures.

We present a theoretical model of DNA self-assembly. For this model a problem is encoded in the molecules and a solution is represented by a complete complex (a complex that does not contain free sticky ends) of appropriate size.

In most experiments, a lot of useless material (non-complete complexes) also appears. The main motive of this work is to optimize the initial solution to minimize the amount of useless material at the end.

The idea is to use the proper proportions of molecule types. The set of vectors that representing these proper proportions is called the "spectrum" of the pot. Algebraic and geometric properties of the spectrum will also be presented.

Although the method developed in this research is mainly applied to DNA self assembly, the idea behind it is very general and s applicable to other self-assembly processes. (Received September 27, 2006)