SEMINAR IN PHYSICS

FRIDAY, FEBRUARY 21

3:30–4:25 – ROSS 0220

REFRESHMENTS

The Motion of Standing: Modeling Balance with Stochastic Processes

Zach Hafen (UNC Physics student)

The means by which the human body remains balanced are both complicated and subtle. We investigate this by studying the motion of the foot's center of pressure. Previous work by the neuromuscular researchers Collins and De Luca established a model based on a bounded random walk, i.e. a simple random process. Using data collected by Gary Heise et al. of the UNC School of Sport and Exercise Science, we expand on the work of Collins and De Luca in analyzing the motion from the perspective of stochastic processes.

Quantum Dot Conjugation - Coating DNA Particles

Donovan Anderson (UNC Physics student)

By integrating nanotechnology with biochemistry, the relatively new field of nanobiochemistry is becoming an important research field with significant contribution for progress in molecular diagnostics. Relatively new research in the area of nanotechnology has focused attention on designing quantum dots coated with DNA strands that can self-assemble into a variety of structures and shapes. Small changes in structure may have an important impact on the functions of the molecule. Quantum dots can be re-fashioned and re-built by creating patterns in the attachment of single strand DNA with smaller strands of DNA. By doing this, the single-stranded DNA can form different structures and patterns.