1058-60-246 **Iddo Ben-Ari**, **Khalid Boushaba**, **Anastasios Matzavinos** and **Alexander Roitershtein*** (roiterst@iastate.edu), 420 Carver Hall, Iowa State University, Ames, IA 50011. *Stochastic analysis of the motion of DNA nanomechanical bipeds.*

We formulate and analyze a Markov process modeling the motion of DNA nanomechanical walking devices. We consider a molecular biped restricted to a well-defined one-dimensional track and study its asymptotic behavior. Our analysis allows for the biped legs to be of different molecular composition and thus to contribute differently to the dynamics. Our main result is a functional central limit theorem for the biped with an explicit formula for the effective diffusivity coefficient in terms of the parameters of the model. A law of large numbers, a recurrence/transience characterization and large deviations estimates are also obtained. Our approach is applicable to a variety of other biological motors such as myosin and motor proteins on polymer filaments.

The talk is based on a joint work with Iddo Ben Ari, Khalid Boushaba, and Anastasios Matzavinos. (Received February 16, 2010)