THE MATERIALS SCIENCE AND ENGINEERING DEPARTMENT FALL COLLOQUIUM SERIES PRESENTS:

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Ions and proteins: the essential partners that fold RNA and DNA

Because both RNA and DNA carry large negative charge, interaction with oppositely charged partners is required for folding and function. Despite the important roles of these partners, little is known about how they structure, or interact with nucleic acids. We develop and apply new experimental tools that highlight the role of partners, ranging from ions through proteins, in important biological processes. I will discuss two synchrotron x-ray studies that probe the structural dynamics of nucleic acids. The first provides a new view of RNA folding, focusing on the critical interplay between the nucleic acid and its ion partners. The second follows DNA as it unwinds from tight storage around a protein core in nucleosome core particles, a basic unit for genome packaging.

Dr. Lois Pollack received her PhD in experimental condensed matter physics from MIT, and moved to Cornell University to pursue postdoctoral studies in low temperature physics. Several years into her studies she happened to read an article about protein folding which piqued her interest in molecular biology. Subsequently, she decided to refocus her research to biophysics. In 1997, with partial support from an NSF award, she joined Sol Gruner's biophysics group at Cornell. In 2000 she joined the faculty of Cornell's School of Applied and Engineering Physics, where she is currently a Professor and the Department Director.

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