

Andrew Spakowitz

Stanford University

The Spakowitz lab is engaged in projects that address fundamental chemical and physical processes that underlie a range of key biological mysteries and cutting-edge materials applications. Current research in our lab focuses on three main research themes: DNA Biophysics, Protein Self Assembly, and Charge Transport in Conjugated Polymers. These broad research areas offer complementary perspectives on chemical and physical processes, and we leverage this complementarity throughout our research. Our approach draws from a diverse range of theoretical and computational methods, including analytical theory of semiflexible polymers, polymer field theory, continuum elastic mechanics, Brownian dynamics simulation, equilibrium and dynamic Monte Carlo simulations, and analytical theory and numerical simulations of reaction-diffusion phenomena. A common thread in our work is the need to capture phenomena over many length and time scales, and our flexibility in research methodologies allows us to address these problems at an unprecedented level of precision.