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Optimization of Energy Transfer Processes in Photosynthetic Systems

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abstract

Excitation energy transfer (EET) in photosynthetic systems can be highly efficient and robust. In this talk, I will discuss the optimization of both natural and artificial systems:

- A simple scaling theory is used to examine the interplay of quantum coherence, dynamic noise, and static disorder in efficient energy transfer.
- The symmetry and network connectivity reveal useful insights into the optimal structure of photosynthetic systems.
- Distributions of fluorescent chromophores on a self-assembling molecular architecture can be optimized to achieve the maximal antenna effect.

*The reported work is a collaboration with J. Wu, J. Kim, and R. Silbey

bio

Jianshu Cao is an associate professor of chemistry at MIT. He received a Ph.D. in physics from Columbia University in 1993. After postdoctoral research at the University of Pennsylvania and at UCSD, he joined the MIT faculty in 1998. His research interests include quantum dynamics of molecular systems, stochastic analysis of single molecule measurements, self-assembly of colloids and polymers, and mechanical properties of cells and bio-molecules.

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