Graphical executive summary of research plans

New technologies for energy applications

<table>
<thead>
<tr>
<th>Solar Energy</th>
<th>Electricity Storage</th>
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<td>Universality of short-range order in organic photovoltaics?</td>
<td>Unusual electrostatic phenomena in nanoscale capacitors</td>
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**synthetic**

**biological**

Fact: thermal annealing in P3HT:PCBM film changes morphology short range order with nanosized domains size ~10 nm can be studied using

New cyberinfrastructure for microstate sampling and large scale quantum chemistry calculations

Fact: atomic force microscopy of photosynthetic membranes shows short range order with photosynthetic complexes of size ~7 nm and 12 nm can be studied using

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New computational models for charge transfer processes

- Surface morphology of electrode
- Structure of interfaces
- Structure of electric double layers
- Redox reactions at phase boundaries
- Solvation structure

**Random matrix theory**

Can be studied using

Detailed statistics on electrical and optical properties of disordered systems

**Postdoc work**

**PhD work**

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