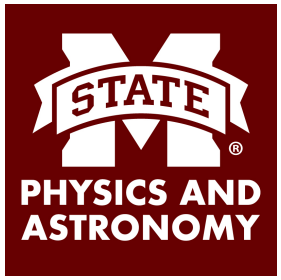
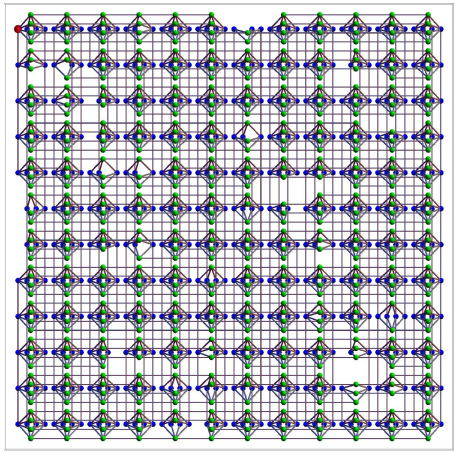
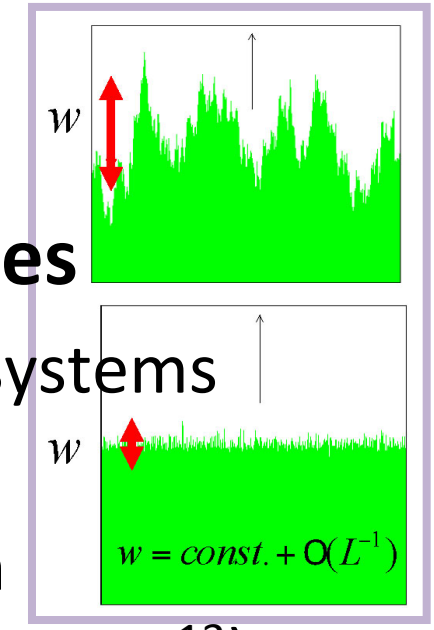


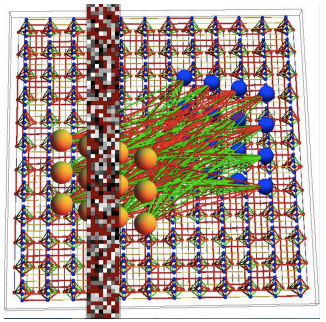
- **Organizations**
  - Mississippi State University [MSU] (USA)
  - Jülich Supercomputing Centre [JSC] (Germany)
- **Mark A. Novotny** Professor MSU
- **Current Team Members**
  - Kristel Michielsen Professor JSC
  - Yaroslav Koshka Professor MSU
  - Tamer Aldwairi Post-Doc MSU
  - Dilina Perera Post-Doc MSU
  - J. Spencer Hall Grad student MSU



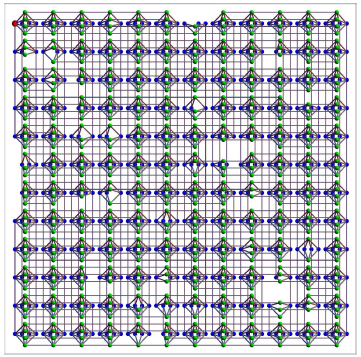
- **Research areas of interest**
  - Improving the next generation of QEO machines
  - Analyzing difficulty of specific problems for QEO
  - Testing QEO machines
  - Simulation and theory for quantum decoherence
  - Algorithm development for QEO
    - *k*-SAT
    - Machine learning
    - Rare-event prediction

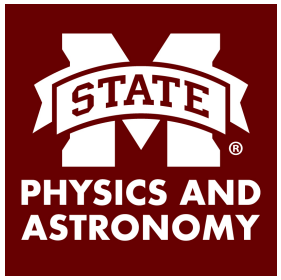


- **Unique qualifications and capabilities**
  - Analyzing 'long-range' interactions in systems (*US patent based on article in Science*)
  - Real-time quantum simulations of spin Hamiltonians with up to 44 spins ($2^{44}=2\times10^{13}$)
  - Experience using 500 & 1000 qubit D-Wave systems
  - Theory and simulations of quantum decoherence
  - Experience with analyzing QEO problems (*k*-SAT, …)
  - Time-dependent simulations of QEO with bath



- **Type of research group you seek to join**
  - **Experiment and simulation for:**
    - Improving the next generation QEO machine
      - Analysis of experimentally realizable, small-world-type graphs
  - **Simulation and theory for:**
    - Classification of problem difficulty for QEO
    - Improvement of next generation QEO
      - Graph theory and critical phenomena methodologies
      - Simulation of real-time Schrödinger equation
    - Algorithms using QEO
      - Machine learning, k-SAT, rare event prediction





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