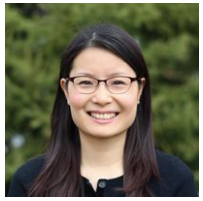
Vladimiro Mujica
Theory, CISS

Bill Petuskey
Physical chemistry



Qing Hua Wang
Surface science, STM

Christian Dwyer
Electron Spectroscopy

Sefaattin Tongay
Quantum materials

Josh Hihath (UC Davis)
Biosensing

Nongjian Tao
Quantum biosensing

Stephen Goodnick
Quantum theory

Giovanna Ghirlanda
Molecular synthesis

Bob Nemanich
Quantum sensing

Jeff Yarger
NMR spectroscopy

Petr Sulc
Computational biology

Robert Culbertson
Science education

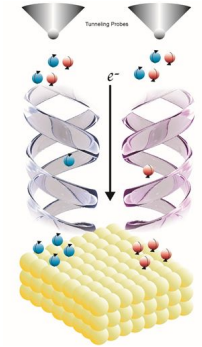
Hao Yan
DNA origami

Nick Stephanopoulos
Macromolecular design

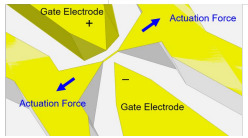
Antia Botana
DFT theory

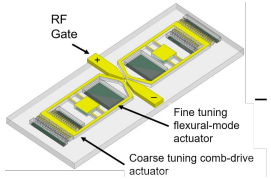
Bill Graves
CXFEL, X-ray lasers

Fundamentals of chiral-quantum interactions



CISS effect





Spectroscopic and transport measurements

Chiral molecules/materials for:

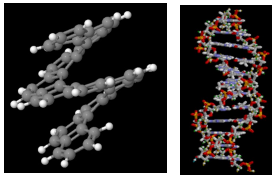
(1) spin filtering and spin-½ control

(2) initializing nuclear spins (QI storage)

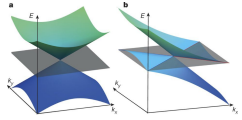
(3) quantum probes for biosensing

Materials, molecules, and interfaces

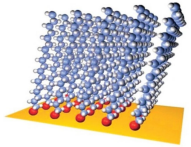
Chiral molecules



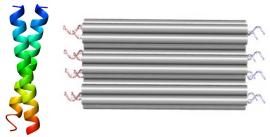
Quantum materials

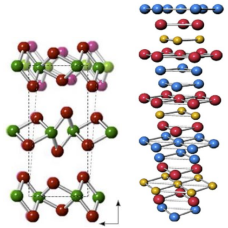


Molecular interfaces

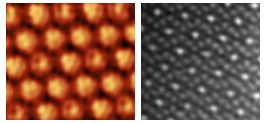


Peptide & DNA assemblies

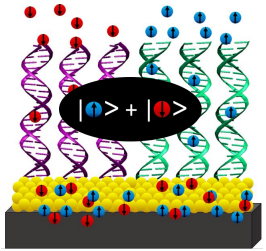




Scanning probe and electron microscopies

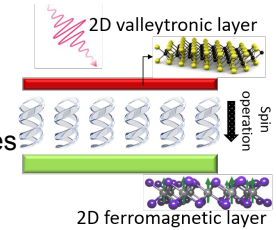


Quantum information, storage, and devices

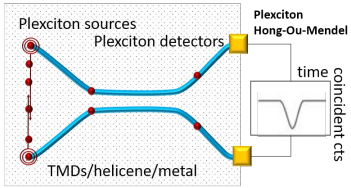


Dynamic nuclear polarization

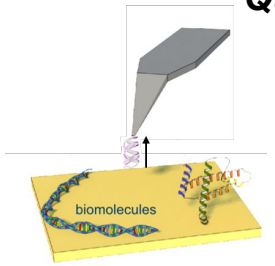
Opto-spin valves



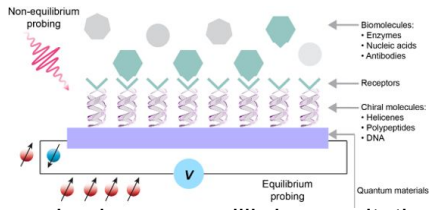
Plexciton based quantum information



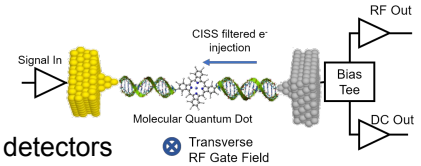
Quantum biosensing



CM-based quantum sensing



Bio-sensing by non-equilibrium excitation



Single molecule NMR detectors

Our needs for...

The Conceptualization

- **Invite collaborators in academia and industry**
  - Theory and computation of CISS effect
  - Macromolecular synthesis and assembly
  - Interface design
  - Quantum device design
    - New designs
    - Adapt existing technologies (superconductors & JTJs, quantum nanophotonics, NV centers)
- **Define and refine conceptualization goals**
  - Identify and prioritize opportunities
  - Strategize implementation
- **Plan and organize teams and facilities**
  - Assess existing resources and gaps
  - Multi-institution contributions and commitments
  - Establish communications protocols

The Institute

- **Mobilize teams and roles**
- **Human resource development**
  - Strategic hires (theory, materials, and devices)
  - Collaborations among workshop participants
  - Students and postdocs
  - Industrial and outreach partnerships
- **Facilities and instrumentation**
  - Commit existing space and facilities
  - Build/strengthen strategic capabilities
    - Spin-polarized STM, ARPES, NMR, nano-MOKE or SPLEEM, probe stations, ultrafast spectroscopy, molecular synthesis and deposition, etc.
- **Establish operations structures**
  - Scientific and business structures, rules of IP management, communities engagement