Frontiers in Condensed Matter Physics and Nanoscale Materials

A Symposium in Celebration of Steven G. Louie's 60th Birthday

4 Le Conte Hall, March 21–22, 2009

- Program -

Saturday, March 21

08:00-8:45 **Registration and Continental Breakfast in 375 LeConte Hall**

Opening Session (Chair—Jeffrey Neaton, LBNL)

08:45– 09:00 Paul Alivisatos, UC-Berkeley, LBNL
Welcome

Session I – Physics of Nanostructures (Chair—Belita Koiller, Inst. de Fisica UFRJ)

09:00–09:25 Alex Zettl, UC-Berkeley
"Alex's Adventures in Louie's Wonderland"

09:25–09:50 Lu Sham, UC-San Diego
"Basic Quantum Dot Physics for Quantum Technology"

09:50–10:15 James R. Chelikowsky, UT-Austin
"Quantum Algorithms for Functionalized Nanostructures"

10:15–10:40 Young-Woo Son, KIAS, South Korea
"Energy Gaps in Graphene Superstructures"

Coffee break (10:40–11:10)

Session II – Electronic and Optical Spectroscopies I (Chair—Sohrab Ismail-Beigi, Yale)

11:10–11:35 Yves Petroff, ESRF, France
"The Early Days of Band Structure Determination by Angle Resolved Photoemission"

11:35–12:00 Mark Hybertsen, BNL
"Theory of Energy Band Gaps: From Semiconductor Crystals to Single Molecule Junctions"

12:00–12:25 Michael Rohlfing, Osnabrueck Univ., Germany
"Electron-Hole Excitations in Condensed Matter: From the Bethe-Salpeter Equation to Dynamical Effects"

Conference Photo (12:25–12:30)
Lunch/Poster Session I (12:30–14:00)

Session III – Nanoscience and Nanotechnology (Chair—Andrew Rappe, Penn)

14:00–14:25 John Joannopoulos, MIT
"Nanotechnologies for Enhanced Survivability"

14:25–14:50 Jisoon Ihm, Seoul National University, South Korea
"Recent Progress on Hydrogen Storage in Carbon-Based Nanostructures"

14:50–15:15 Kee Joo Chang, KAIST, South Korea
"Donor-pair Defects and Doping Efficiency in Silicon Nanowires"

15:15–15:40 Gérard Martinez, HMFL, France
"New Polaronic Effects in Single Doped GaAs Quantum Wells"

Coffee break (15:40–16:10)

Session IV—New Phenomena (Chair—Michael Crommie, UC-Berkeley)

16:10–16:35 David Vanderbilt, Rutgers
"In Search of Chern Insulators"

16:35–17:00 Che-Ting Chan, Hong Kong Univ. of Science & Tech.
"Illusion Optics"

17:00–17:25 Philip Allen, SUNY Stony Brook
"Charge Transfer Chemistry is an Entangled Quantum Process: Nuclei are Neither Classical nor Adiabatic"

17:25 **END 1st DAY of TALKS**

18:30–22:30 BANQUET, Bancroft Hotel

Banquet Program (Chair—Jeffrey Neaton, LBNL)

20:00–20:20 Marvin L. Cohen, UC-Berkeley
"SGL: Past, Present, and Future"

20:20–21:00 Additional Speakers

Sunday, March 22

Session V—Electronic and Optical Spectroscopies II (Chair —Mei-Yin Chou, Georgia Tech)

09:00–09:25 Ward Plummer, Louisana State Univ.
"Anisotropic Electron-Phonon Coupling on a Two Dimensional Isotropic Fermi Contour"

09:25–09:50 Roberto Car, Princeton
"The Effect of Disorder and Temperature on the X-ray Absorption Spectrum of Water"

09:50–10:15 Stephen Fahy, Univ. College Cork, Ireland
"Coherent Phonon Dynamics in Photo-excited Bismuth"

10:15–10:40 Catalin Spataru, Sandia Livermore
"Quasiparticle and Excitonic Effects in Doped Semiconducting Single-Walled Carbon Nanotubes"

Coffee break (10:40—11:10)

Session VI—Nano Spectroscopies (Chair—Richard Martin, University of Illinois)

11:10–11:35 Susumu Saito, Tokyo Inst. of Tech., Japan
"Quasiparticle States in Nanostructured Materials"

11:35–12:00 Angel Rubio, Univ. of the Basque Country, CSIC, ETSF, Spain
"Theoretical Spectroscopy of Complex Nanostructures and Biomolecules: Emergence of the ETSF"

12:00–12:25 Francesco Mauri, Université Pierre et Marie Curie, Paris
"Computing Electron-Phonon Coupling and Phonon Dispersion with GW: Impact of Electron-Electron Correlation in Graphene/Graphite and the Failure of LDA/GGA DFT Functionals"

Lunch/Poster Session II (12:25–14:00)

Session VII—Electronic Structure Theory and Applications (Chair—Jerry Bernholc, NCSU)

14:00–14:25 Morrel H. Cohen, Rutgers, Princeton
"Order-N Electonic-Structure and Quantum Dynamics via Partition Theory"

14:25–14:50 Matthias Scheffler, FHI, Berlin
"Active Sites, Rate Limiting Steps, and the System Chemistry of Heterogeneous Catalysis"

14:50–15:15 Kai Ming Ho, Ames Lab
"Gutzwiller Density Functional Theory for Correlated Electron Systems"

15:15–15:40 Enge Wang, Inst. of Physics, Beijing
"Ice Ih Surfaces: Unexpectedly Cold"

Coffee break (15:40–16:10)

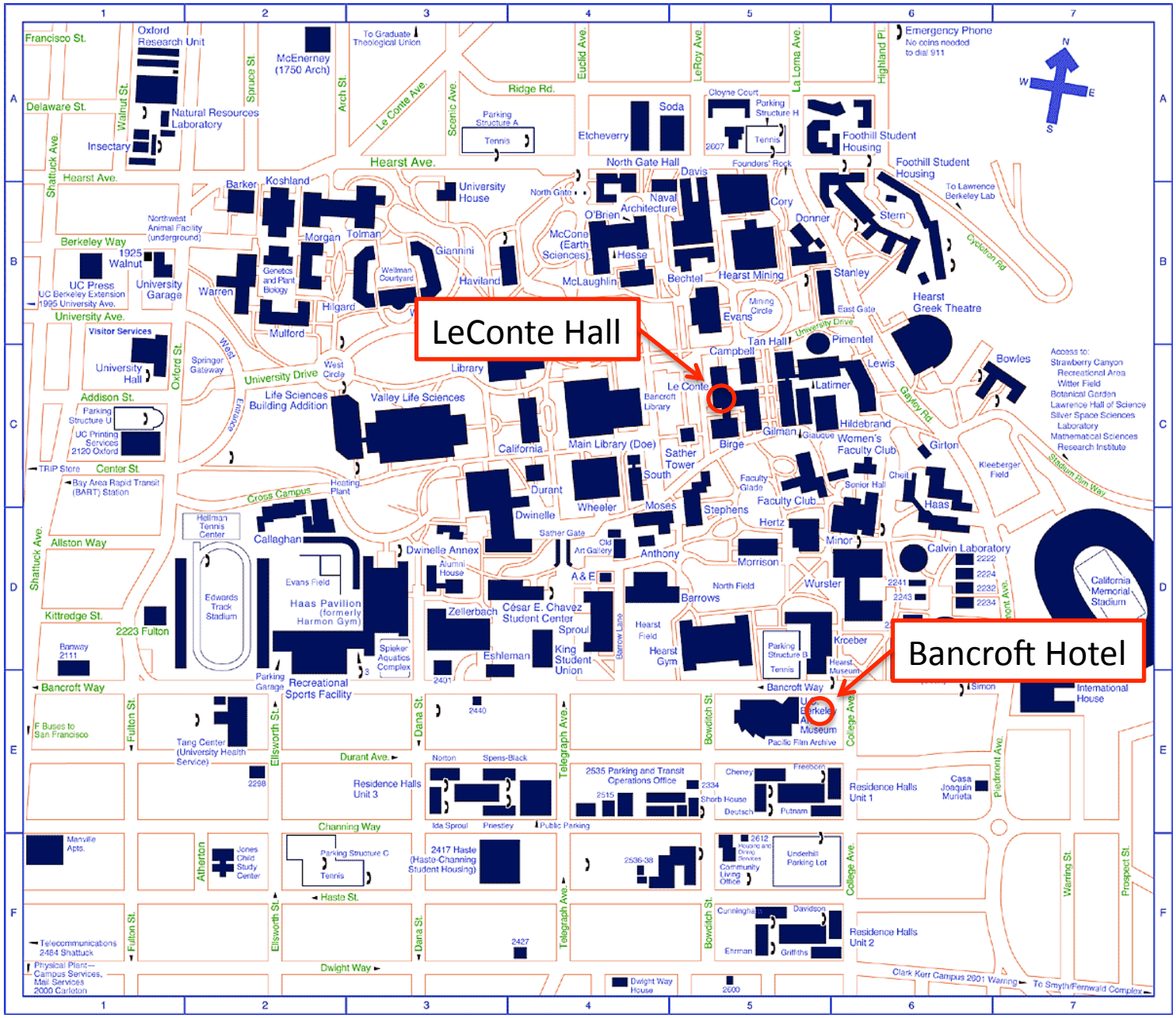
Session VIII—Superconductivity (Chair—Warren Pickett, UC-Davis)

16:10–16:35 Hiroshi Kamimura, Tokyo Univ. of Science, Japan
"A New Phase Diagram for Fermi Surface and Superconductivity in High Tc Superconductors"

16:35–17:00 Hyoung Joon Choi, Yonsei University, South Korea
"First-Principles Study of Atomic, Electronic, and Magnetic Properties of Iron Pnictides"

17:00–17:25 James C. Phillips, Rutgers
"What Theoretical Physics Can Tell Us About High Temperature Superconductivity, and Vice-Versa"

End of Conference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Bancroft Hotel
Le Conte
Hearst Ave.
Bancroft Way
Durant Ave.
Channing Way
Haste St.
Dwight Way
Berkeley Way
University Ave.
University Drive
Addison St.
Center St.
Allston Way
Kittredge St.
Shattuck Ave.
Oxford St.
Fulton St.
Ellsworth St.
Dana St.
Telegraph Ave.
Bowditch St.
College Ave.
Piedmont Ave.
Warring St.
Prospect St.
Hearst Mining
Hearst Greek Theatre
Calvin Laboratory
California Memorial Stadium
Haas Pavilion (formerly Harmon Gym)
Valley Life Sciences
Life Sciences Building Addition
Main Library (Doe)
Sather Tower
Campbell
Tan Hall
Pimentel
Lewis
Bowles
Hildebrand
Gilman
Birge
Women's Faculty Club
Girton
Haas
Minor
Wurster
Kroeber
Morrison
Barrows
Anthony
Moses
Stephens
Hertz
Faculty Club
Faculty Glade
Sonior Hall
Cheit
Kleeberger Field
Stadium Rim Way
Gayley Rd.
Cyclotron Rd
Cross Campus
Heating Plant
Hellman Tennis Center
Callaghan
Evans Field
Edwards Track Stadium
Spieker Aquatics Complex
Recreational Sports Facility
Parking Garage
Dwinelle Annex
Alumni House
Zellerbach
César E. Chavez Student Center
Sproul
Eshleman
King Student Union
Hearst Field
Hearst Gym
Barrow Lane
North Field
Old Art Gallery
A & E
Sather Gate
Dwinelle
Durant
Wheeler
South
California
Library
Bancroft Library
Le Conte
Campbell
Latimer
Hildebrand
Gilman
Giauque
Birge
Sather Tower
Main Library (Doe)
Hearst Mining
Bechtel
McLaughlin
Hesse
McCone (Earth Sciences)
O'Brien
Naval Architecture
Davis
Cory
Donner
Stern
Stanley
Evans
Mining Circle
East Gate
Hearst Museum
Pacific Film Archive
Simon
International House
Casa Joaquin Murieta
Residence Halls Unit 1
Residence Halls Unit 2
Residence Halls Unit 3
Underhill Parking Lot
Community Living Office
Cunningham
Davidson
Ehrman
Griffiths
Cheney
Freeborn
Putnam
Deutsch
Shorb House
Norton
Spens-Black
Ida Sproul
Priestley
Public Parking
2535 Parking and Transit Operations Office
2417 Haste (Haste-Channing Student Housing)
Jones Child Study Center
Parking Structure C
Tennis
Manville Apts.
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Physical Plant—Campus Services, Mail Services 2000 Carleton
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Clark Kerr Campus 2601 Warring
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Tang Center (University Health Service)
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Bancroft Way
Delaware St.
Francisco St.
Oxford Research Unit
Natural Resources Laboratory
Insectary
McEnerney (1750 Arch)
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To Lawrence Berkeley Lab
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Koshland
University House
North Gate
North Gate Hall
Founders' Rock
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Mathematical Sciences Research Institute
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