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19. ABSTRACT (Continue on reverse if necessary and identify by block number) A Gordon Research Conference on the Electron Spectroscopy was held at the Brewster Academy 18 - 22 July 1988. There were 100 attendees. A broad range of modern techniques were covered, including various combinations of excitation sources, targets, and detectors. Yet the conference uses electron spectroscopy as a common thread to draw together and focus diverse approaches to frontier research topics. There were 21 speakers who were recognized leaders in their technology areas. There were 30 poster papers on diverse topics.			
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FINAL REPORT OF
THE GORDON RESEARCH CONFERENCE ON ELECTRON SPECTROSCOPY
BREWSTER ACADEMY, WOLFEBORO, NEW HAMPSHIRE

18-22 JULY 1988

Daniel T. Pierce, Chairman
National Bureau of Standards
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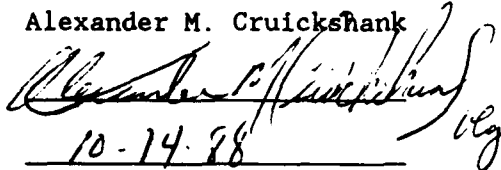
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Daniel T. Pierce

July 27, 1988
Physicist

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FINAL REPORT

Gordon Research Conference on Electron Spectroscopy
18-22 July 1988, Wolfeboro, New Hampshire

The Gordon Research Conference on Electron Spectroscopy was held at Brewster Academy, Wolfeboro, NH during the week of 18-22 July 1988. The program, consisting of 21 invited speakers and 30 contributed posters, is attached. The invited talks were presented during morning and evening plenary sessions. Each session had a Chairman and Discussion Leader, as indicated on the program, and talks were limited to 40 minutes in order to reserve at least one-third of each session for discussion, which is the prime goal of Gordon Conferences. The posters were presented in two late afternoon sessions. The attendance at all sessions was excellent and the discussion was uniformly stimulating and at a high level. The organizers were very gratified by the quality and clarity of all 21 invited speakers, and comments from the attendees were very favorable. The list of attendees is also attached showing that approximately 100 attended, including 31 conferees from 12 foreign countries.

The scope of the Gordon Conference on Electron Spectroscopy covers a range of modern techniques too numerous to mention, including various combinations of excitation sources (synchrotron radiation, laser radiation, electron beams, heavy ion beams, metastable atoms, etc.), targets (free atoms and molecules, adsorbed atoms and molecules, clusters, surfaces, solids, liquids and interfaces, etc.), and detectors (energy, ejection-angle, spin analyzers, often in coincidence with another observation channel, etc.). Yet, the conference is not technique oriented. Rather, it uses electron spectroscopy as common thread to draw together and focus diverse approaches to frontier research topics. Especially stimulating and fruitful exchanges occur across the gas phase/condensed matter boundary and between basic and applied sciences. The program for the 1988 meeting stressed a carefully selected subset of possible topics chosen to represent hot, rapidly evolving areas as well as major core areas within the broad scope of the meeting. The session titles in the attached program give a synopsis of the emphasized topics.

The conference budget of \$28,200 (\$10,200 from the Gordon Research Conferences, \$6,000 from the Air Force Office of Scientific Research, \$7,500 from the Office of Naval Research, and \$4,500 from the National Science Foundation) was used to pay the conference fee, which included room and board for the week, for the 21 invited speakers, 8 session chairs, 8 discussion leaders, the conference chairman and vice-chairman. A contribution was made toward the conference fee of 8 graduate students, 5 postdocs, and 5 faculty; seven persons in these three categories were from foreign countries. In addition, partial travel support was provided, according to need, to 7 speakers, 14 session chairs and discussion leaders, the conference chairman, and vice-chairman. The success of the conference depended upon attracting the very best speakers, chairs, and discussion leaders. This would not have been possible without the supplemental financial support received from AFOSR, ONR, and NSF.

The next conference in this series will be held in 1990. The Chairman will be Professor V. McKoy, Department of Chemistry and Chemical Engineering, California Institute of Technology, and the Vice-Chairman will be Dr. Wolfgang Eberhardt, Exxon Research and Engineering Co.

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GORDON RESEARCH CONFERENCE ON ELECTRON SPECTROSCOPY
18-22 July 1988, Brewster Academy, Wolfeboro, NH

Dan Pierce, Chairman

Vince McKoy, Vice-Chairman

Monday morning, July 18: "Electron Spectroscopy with High Spatial Resolution"

Chairman H.W. Pink
Discussion Leader Y.L. Fu

Speakers

N.D. Lang "Theory of Single Atom Imaging in the STM"
J.A. Stroscio "Scanning Tunneling Spectroscopy of Single Atoms on Surfaces"
P.E. Batson "Silicon 2p Absorption Spectra Obtained Near Defects and Interfaces
using Spatially Resolved Electron Energy Loss Spectroscopy"

Monday evening, July 18: "State Specific Studies in the Electron Spectroscopy of
Atoms and Molecules"

Chairman C.W. Clark
Discussion Leader R.N. Compton

Speakers

J.L. Dehmer "Probing Excited Molecular States with Multiphoton Ionization"
J.J. McClelland "Spin Polarized Electron-Atom Scattering"

Tuesday morning, July 19: "New Trends in Photoelectron Spectroscopy of Atoms
and Molecules"

Chairman G.M. Bancroft
Discussion Leader G. Du Jardin

Speakers

J.H.D. Eland "Photoelectron-Photoelectron Coincidence Spectroscopy and the
Spectra of Doubly Charged Ions"
J. Comer "Photoelectron Studies of Autoionizing Resonances"
C.A. deLange "UV Photoelectron Spectroscopy of Transient Species"

Tuesday evening, July 19: "Thin Films and Interfaces"

Chairman W.E. Spicer
Discussion Leader D.L. Mills

Speakers

H. Ibach "Phonon Dispersion in Ultrathin Epitaxial Overlayers"
S.A. Chambers "Atomic Geometry and Bandbending at Semiconductor Interfaces"

Wednesday morning, July 20: "Atoms to Solids"

Chairman A. Kaldor
Discussion Leader P.J. Feibelman

Speakers

C. Brechignac "Transition from Van der Waals to Metallic Clusters"
Ph. Avouris "Desorption Induced by Electronic Transitions"
B. Schmiedeskamp "Spin Resolved Photoemission from Xe-adsorbates on Pd(111) and
 a New Spin Polarization Effect with Linearly Polarized Light"

Wednesday evening, July 20: "SEXAFS/NEXAFS Studies of Vibrations/Structure"

Chairman E.A. Stern
Discussion Leader K. Baberschke

Speakers

F. Sette "Surface-Atom Vibrational Amplitudes Studied with SEXAFS"
J. Stohr "NEXAFS Studies of Simple and Complex Molecules"

Thursday morning, July 21: "Spin Resolved, Time Resolved, and Coincidence Spectroscopies"

Chairman Y. Petroff
Discussion Leader J.E. Rowe

Speakers

J.P. Long "Time Resolved Synchrotron Photoemission from Laser-Excited Surfaces"
E. Jensen "Auger-Photoelectron Coincidence Spectroscopy of Solids using
 Synchrotron Radiation"
P.D. Johnson "Angle Resolved Spin-Polarized Photoemission Studies of Adsorbates on
 Ferromagnetic Surfaces"

Thursday evening, July 21: "Surface Structure and Phase Transitions"

Chairman H.R. Poppa
Discussion Leader M.G. Lagally

Speaker

E. Bauer "Low Energy Electron Microscopy"

Friday morning, July 22: "Electron Spectroscopy of High T_c Superconductors"

Chairman D.E. Ramaker
Discussion Leader C.R. Brundle

Speakers

P. Steiner "XPS of High T_c Superconductors"
J.H. Weaver "Surfaces and Interface Properties of High T_c
 Superconductors: Photoemission and Inverse
 Photoemission"

AFFILIATIONS

Speakers

Ph. Avouris	IBM Yorktown	USA
P.E. Batson	IBM Yorktown	USA
E. Bauer	Univ. Clausthal	Germany
C. Brechignac	Univ. Orsay	France
J. Comer	Univ Manchester	UK
S.A. Chambers	Boeing	USA
J.L. Dehmer	Argonne	USA
J.H.D. Eland	Oxford Univ.	UK
H. Ibach	IGV-KFA	Germany
E. Jensen	Brandeis Univ.	USA
P.D. Johnson	Brookhaven	USA
N.D. Lang	IBM Yorktown	USA
C.A. deLange	Free Univ. - Amsterdam	The Netherlands
J.P. Long	Naval Research Lab	USA
J.J. McClelland	NBS	USA
B. Schmiedeskamp	Univ. Bielefeld	Germany
F. Sette	ATT Bell Labs	USA
J. Stohr	IBM Almaden	USA
P. Steiner	Univ. Saarbrücken	Germany
J.A. Stroschio	NBS	USA
J.H. Weaver	Univ. Minnesota	USA

Session Chairmen

G.M. Bancroft	Univ. Western Ontario	Canada
C.W. Clark	NBS	USA
H.W. Fink	IBM Zurich	Switzerland
A. Kaldor	Exxon	USA
H.R. Poppa	IBM Almaden	USA
Y. Petroff	LLRE-Orsay	France
D.E. Ramaker	George Washington Univ.	USA
W. E. Spicer	Stanford Univ.	USA
E.A. Stern	Univ. Washington	USA

Discussion Leaders

K. Baberschke	Freie Univ - Berlin	Germany
C.R. Brundle	IBM Almaden	USA
R.N. Compton	Oak Ridge	USA
G. Du Jardin	Univ. Paris (Orsay)	France
P.J. Feibelman	Sandia	USA
Y.L. Kuk	ATT Bell Labs	USA
M.G. Lagally	Univ. Wisconsin	USA
D.L. Mills	Univ. California-Irvine	USA
J.E. Rowe	ATT Bell Labs	USA

MONDAY POSTER SESSION

- * Posters put up on Monday after lunch
- * Poster session 5:00 - 6:00 p.m. Monday
- * Posters taken down before noon on Wednesday

- M1 Atom-Resolved Si Surface Chemistry Using Scanning Tunneling Microscopy/Spectroscopy
Ph. Avouris, R. Wolkow (IBM T.J. Watson Research Center)
- M2 Theoretical Study of the Imaging of Defects on Graphite by STM
M.R. Soto, J.P. Lowe (Pennsylvania State University)
- M3 First Synchrotron Radiation Images From a Photoelectron Microscope
P. Pianetta, I. Lindau, P.L. King (Stanford University), M. Keenlyside, G. Knapp (Surface Science Instruments), R. Browning (Stanford University)
- M4 Photoemission Study of Alkali/GaAs(110) Interfaces
M. Prietsch, M. Domke, C. Laubschat, T. Mandel, C. Xue, G. Kaindl (Freie Universität Berlin)
- M5 Spin Selective Excitations in bcc Co and Other Ferromagnetic Systems
Y. Idzerda (Naval Research Laboratory)
- M6 Ultraviolet Photoelectron Spectroscopy of Unstable Closed and Open-Shell Molecules
N.P.C. Westwood (University of Guelph)
- M7 Photoionization From Atomic Zn3d in the 50-190 eV Photon Energy Range
J.J. Bolick, M.S. Banna (Vanderbilt University)
- M8 Double Photoionization of Atomic Silver
L. Hellner, G. Dujardin, M.Y. Adam, F. Combet Farnoux, P. Martin (Universite Paris-Sud), A.W. Svensson (Daresbury Laboratory)
- M9 Vibrationally-Resolved Photoelectron Studies of the 7σ Level of N_2O
T.A. Ferrett, A.C. Parr, S.H. Southworth, J.E. Hardis (National Bureau of Standards), J.L. Dehmer (Argonne National Laboratory)
- M10 Photofragmentation of Methylene Chloride in the Energy Regions of the C 1s and the Cl 2p Edges
R.G. Hayes (University of Notre Dame)
- M11 Photoionisation of the Argon Iso-Electronic Molecules HCl, H_2S , PH_3 Using Synchrotron Radiation: β Measurements for the Outer and Inner Valence Shells
M.Y. Adam (Universite Paris), C. Cauletti (Universita "La Sapienza"), M.N. Piancastelli (II Universita "Tor Vergata"), W.A. Svensson (Daresbury Laboratory)

- M12 Lifetime-Vibrational Interference in the Autoionization of Core-Excited O_2
T.X. Carroll, T.D. Thomas (Oregon State University)
- M13 Influence of the Autoionization in the Calculation of the Fluorescence Polarization After Photoionization
H. Lefebvre-Brion (Universite Paris-Sud)
- M14 (e,2e) Momentum Spectroscopic Study of the C = C π -Orbital of the Vinyl Halides
J.H. Moore, J.A. Tossell, P.R. Goruganthu, M.A. Coplan (University of Maryland), K.T. Leung (University of Waterloo)
- M15 XPS-AES Analysis of CdTe Thin Films Grown by Rf Sputtering
J.L. Pena, CINVESTAV-IPN Unidad Merida, I. Hernandez, S. Jimenex, and V. Sailer (CINVESTAV-IPN Mexico City)

WEDNESDAY POSTER SESSION

- * Posters put up on Wednesday after lunch
- * Poster session 5:00 - 6:00 P.M. Wednesday

- W1 Auger Electron-Ion Coincidence Studies on the Dynamical Behavior of CS₂ Upon Core Excitation
W. Eberhardt, (Exxon Research and Engineering Co.) and R.G. Hayes (University of Notre Dame)
- W2 A Triple Coincidence Electron Impact Energy Loss Spectrometer for the Investigation of the Electronic Structure of Small Carbon Cluster
J.W. Keller (Goddard Space Flight Center), M.A. Coplan, R.R. Goruganthu (University of Maryland)
- W3 Competition Between Autoionization and Predissociation in the HCl Molecule
H. Lefebvre-Brion, F. Keller, H. Frohlich, P.M. Guyon (Universite de Paris-Sud), M. Glass-Maujean (Laboratoire de Spectroscopie Hertzienne de l'Ecole Normale Supérieure)
- W4 Photoelectron-Photoelectron Coincidence Studies of Double Ionization in Rare Gas Solids
G. Dujardin, L. Hellner, M.J. Bernard-Ramage (Universite de Paris-Sud), H.W. Biester, E.E. Koch (Max-Planck Institut, Berlin)
- W5 Resonant Processes Above the Carbon 1s Ionization Threshold in Benzene and Ethylene
M.N. Piancastelli (II University of Rome), T.A. Ferrett, D.W. Lindle (National Bureau of Standards), P.A. Heimann (Technische Universität München), L.J. Medhurst, S.H. Liu, D.H. Shirley (University of California and Lawrence Berkeley Laboratory)
- W6 Surprising Similarities in the De-Excitation Electron Spectra of Core-Excited CO, CO₂, and OCS
T.X. Carroll, S.E. Anderson, De Ji, T.D. Thomas (Oregon State University)
- W7 Discovery of Unusually Large Anisotropy in Resonance Auger Processes
T.A. Carlson, D.R. Mullins (Oak Ridge National Laboratory), C.E. Beall, B.W. Yates, J.W. Taylor (University of Wisconsin), D.W. Lindle (National Bureau of Standards), B.P. Pullen, (University of Southeastern Louisiana), F.A. Grimm (University of Tennessee)
- W8 Linear Correlation of Oxygen Core-Ionization Energies of Alcohols and Acids with Those of the Corresponding Methyl and Ethyl Ethers and Esters
M.R.F. Siggel, (Lawrence Berkeley Laboratory), T. D. Thomas (Oregon State University)
- W9 STM Studies of Steps on Vicinal Si(100) and Si(111)
Y.W. Mo, B. Swartzentruber, M.B. Webb, M.G. Lagally (University of Wisconsin-Madison)

- W10 Spectroscopic Observation of the Formation and Deformation of a Surface Alloy
J.G. Tobin, J.C. Hansen (University of Wisconsin)
- W11 Structure of Cu/Si(111) "5x5"
D. Chambliss, T. Rhodin (Cornell University)
- W12 Calculations of Electron Inelastic Mean Free Paths for 31 Materials
S. Tanuma (Nippon Mining Company, Ltd.), C.J. Powell, D.R. Penn (National Bureau of Standards)
- W13 Vibrational Anisotropy and Anharmonicity of N Atoms Bonded to Ni(100)
L. Wenzel, J. Stöhr, D. Arvanitis, K. Baberschke (Freie Universität Berlin)
- W14 Angular Distribution of Photoelectrons from Silver Bromide and Metallic Silver Through the Cooper Minimum
G.N. Kwawer T.J. Miller (University of Illinois), M.G. Mason, Y. Tan (Eastman Kodak Company), F.C. Brown, Y.J. Ma (University of Washington)
- W15 Improved Low-Energy Diffuse Scattering Electron-Spin Polarization Analyzer
M.R. Scheinfein, D.T. Pierce, J. Unguris, J.J. McClelland, R.J. Celotta (National Bureau of Standards)

GORDON RESEARCH CONFERENCES
ELECTRON SPECTROSCOPY
Brewster Academy, Wolfeboro, New Hampshire
July 17-22, 1988

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Electron Spectroscopy
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