**ELI ROTENBERG**
*MS 2-400, Advanced Light Source*
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**Research Interests**

The beauty of electronic structures of solids; relationship of electronic structure to geometry, symmetry, and dimensionality; dielectric response at various wavelengths, time scales; the role of many-body effects on the ground states of metals; semiconductors, metals, quasicrystals.

**Education**

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|---|---|
| *PhD.* | Department of Physics, University of California at Berkeley, 1993. Thesis title: "*The Relationship Between Structure and Core-Level Shifts in Thin Epitaxial Films of $CaF_2$ and $SrF_2$ on Si(111),"* Advisor: Professor Marjorie A. Olmstead. |
| *M.A.* | Department of Physics, University of California at Berkeley, 1989. |
| *B.S.* | Applied and Engineering Physics, Cornell University, 1987. |

**Career History**

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|---|---|
| *2002-* | Senior Staff Scientist (113.6) at the Advanced Light Source, Lawrence Berkeley National Laboratory |
| *1999-02* | Staff Scientist(113.5) at the Advanced Light Source, Lawrence Berkeley National Laboratory |
| *1996-98* | Scientist (113.4) at the Advanced Light Source, Lawrence Berkeley National Lab |
| *1993–96* | Postdoctoral Fellow at Materials Science Institute, University of Oregon (supervisor: Prof. S. D. Kevan). |
| *1987–93* | Graduate Study and Research at U. C. Berkeley (supervisor: Prof. M. A. Olmstead), Los Alamos Natl. Lab, and LBNL |

**Awards**

2001 Peter Mark Award, American Vacuum Society
2000 Best Poster Contribtion of Aperiodic 2000 Meeting, Nijmegen NL
1999 Best Contribution Award of ICQ7 (International Conf. on Quasicrystals, Stuttgart)
1999 Outstanding Performance Award, Lawrence Berkeley National Laboratory
1998, 1999 Dave Shirley Prize, Advanced Light Source Users' Executive Committee
1990,1991 Department of Education National Needs Fellowship.
1987 Paul Hartzmann Prize (undergraduate experimental physics at Cornell University).

**Professional Societies**

American Physical Society

**References**

*current supervisor*
Dr. Z. Hussain
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Prof. Steve D. Kevan
Department of Physics
University of Oregon
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*thesis supervisor*
Prof. Marjorie A. Olmstead
Department of Physics
University of Washington
Seattle, WA 98195
(206) 685–3031

## Highest-Impact Publications

8. *"The Relationship Between Structure and Core-Level Shifts in Thin Epitaxial Films of $CaF_2$ and $SrF_2$ on Si(111),"* PhD Thesis, University of California, 1993.

16. *"Local Field Effects on Photoemission of* $C_{60}$*,"* Eli Rotenberg, C. Enkvist, P. A. Brühwiler, A. J. Maxwell, and Nils Mårtensson, Physical Review **B54** (8) R5279-5282 (1996).

17. *"Resonant X-Ray Emission Spectroscopy of Molecular Oxygen,"* P. Glans, K. Gunnelin, P. Skytt, J. H. Guo, N. Wassdahl, J. Nordgren, H. Ågren, F. Kh. Gel'mukhanov, T. Warwick, and Eli Rotenberg, Physical Review Letters, **76**(14)2448-2451 (1996).

18. *"Ratio of Cross Sections for Double to Single Ionization of He by 85-400 eV Photons,"* R. Dörner, T. Vogt, V. Mergel, H. Khemliche, S. Kravis, C. L. Cocke, J. Ullrich, M. Unverzagt, L. Spielberger, M. Damrau, O. Jagutzki, I. Ali, B. Weaver, K. Ullmann, C. C. Hsu, M. Jung, E. P. Kanter, B. Sonntag, M. H. Prior, E. Rotenberg, J. Denlinger T. Warwick, S. T. Manson, and H. Schmidt-Böcking, Physical Review Letters, **76**(15)2654-2657 (1996).

27. *"Observation of Quantum Well Interference in Magnetic Nonostructures by Photoemission,"* R. K. Kawakami, E. Rotenberg, E. J. Escorcia-Aparicio, H. J. Choi, T. R. Cummins, J. G. Tobin, N. V. Smith, and Z. Q. Qiu, Physical Review Letters, **80**(8), 1754-1757 (1998).

29. *"Evolution of Fermi Level Crossings vs H Coverage on W(110)*," E. Rotenberg and S. D. Kevan, Physical Review Letters **80**(13), 2905-2908 (1998).

39. *"Quantum Well States of the Cu/Co(100) System Probed by a Thin Ni Layer,"* R. K. Kawakami, E. Rotenberg, Hyuk J. Choi, Ernesto J. Escorcia-Aparicio, M. O. Bowen, J. H. Wolfe, E. Arenholz, Z. Zhang, N. V. Smith, and Z. Q. Qiu, Nature, **398** N6723:132-134 (1999).

40. *"Spin-Orbit Coupling Induced Surface Band Splitting in Li/W(110) and Li/Mo(110),"* Eli Rotenberg, J. W. Chung, and S. D. Kevan, Phys. Rev. Lett **82**, 4066 (1999).

41. *"Determination of the Magnetic Coupling in the Co/Cu./Co(100) System with Momentum-Resolved Quantum Well States,"* R. W. Kawakami, E. Rotenberg, E. J. Escorcia-Aparicio, Hyuk J. Choi, J. H. Wolfe, N. V. Smith, and Z. Q. Qiu, Physical Review Letters, **82**(20), 4098 (1999).

42. *"Instability and Charge Density Wave of Metallic Quantum Chains on a Silicon Surface,"* H. W. Yeom, S. Takeda, E. Rotenberg, I. Matsuda, K. Horikoshi, J. Schaefer, C. M. Lee, S. D. Kevan, T. Ohta, T. Nagao, and S. Hasegawa, Phys. Rev. Lett. **82**(24), 4898 (1999).

44. *"Direct Spectroscopic Observation of the Energy Gap Formation in the Spin Density Wave Phase Transition at the Cr(110) Surface,"* J. Schäfer, E. Rotenberg, and S. D. Kevan, Phys. Rev. Lett. **83**(10), 2069 (1999).

49. *"Photoelectron Diffraction Imaging for* $C_2H_2$ *and* $C_2H_4$ *Chemisorbed on Si(100) Reveals a New Bonding Configuration,"* S. H. Xu, M. Keeffe, Y. Yang, C. Chen, M. Yu, G. J. Lapeyre, E. Rotenberg, J. Denlinger, and J. T. Yates, Jr., Phys. Rev. Lett. **84**(5), 939 (2000).

52. *"Coupling Between Adsorbate Vibrations and an Electronic Surface State,"* E. Rotenberg, J. Schäfer, and S. D. Kevan, Phys. Rev. Lett. **84**(13), 2925 (2000).

54. *"Quasicrystal Valence Bands in Decagonal AlNiCo,"* E. Rotenberg, W. Theis, K. Horn and P.

Gille, Nature, **406**, 602 (2000).

58. "*Fermi contours and adsorbate phonon anomalies for Li/Mo(110) and Li/W(110),*" E. Rotenberg and S. D. Kevan , J. Vac. Soc. Technol. **A19**(4), in press (2001).

61. "*High-temperature Symmetry Breaking in the Electronic Band Structure of the Quasi-One-Dimensional Solid $NbSe_3$,*" J. Schaefer, E. Rotenberg, S. D. Kevan, P. Blaha, et al, Phys. Rev. Lett. **87**(19) 6403 (2001).

63. "*Differential Photoelectron Holography-A new approach for three-dimensional atomic imaging,*" S. Omori, Y.Nihei, E. Rotenberg, J. D. Denlinger, et al Phys. Rev. Letters, **88,** 055504(2002).

70. "*Spin-Resolved Photoemission of Surface States of W(110)-(1x1)H,*", M. Hochstrasser, J. G. Tobin, E. Rotenberg, S. D. Kevan, Physical Review Letters, **8921**(21), 6802 (2002).

74. "*Unusual Spectral Behaviour of Charge Density Waves with Imperfect Nesting in a Quasi-One-Dimensional Metal,*", J. Schafer, M. Sing, R. Claessen, E. Rotenberg, X. J. Zhou, R. E. Thorne, S. D. Kevan, Physical Review Letters, **91**: 066401 (2003).

80. "*In $\sqrt{7} \times \sqrt{3}$ on Si(111): A Nearly Free Electron Metal in Two Dimensions,*", E. Rotenberg, H. Koh, K. Rossnagel, H. W. Yeom, J. Schäfer, B. Krenzer, M. Rocha, S. D. Kevan, Physical Review Letters **91**(24), 6404 (2003).

82. "*Electronic Quasiparticle Renormalization on the Spin-Wave Energy Scale,*", J. Schafer, D. Schrupp, E. Rotenberg, K. Rossnagel, H. Koh, P. Blaha, and R. Claessen, Physical Review Letters, **92**(9),7205 (2004).

85. "*Fully Differential Cross Sections for Photo-double-ionization of $D_2$,*" T. Weber, A. Czasch, O. Jagutzki, A. Muller, V. Mergel, A. Kheifets, J. Feagin, E. Rotenberg, G. Meigs, M. H. Prior, S. Daveau, A. L. Landers, C. L. Cocke, T. Osipov, H. Schmidt-Bocking, R. Dorner, Physical Review Letters, **92**(16), 3001 (2004).

88. "*Fermi Surface and Quasiparticle Dynamics of $Na_{0.7}CoO_2$ Investigated by Angle-Resolved Photoemission Spectroscopy*",M. Z. Hasan, Y.-D. Chuang, D. Qian, Y. W. Li, Y. Kong, A. Kuprin, A. V. Fedorov, R. Kimmerling, E. Rotenberg, K. Rossnagel, Z. Hussain, H. Koh, N. S. Rogado, M. L. Foo, and R. J. Cava, Physical Review Letters, **92**(24), 6402 (2004).

90. "*Complete photo-fragmentation of the deuterium molecule*", T. Weber, A. O. Czasch, O. Jagutzki, A. K. Muller, V. Mergel, A. Khelfets, E. Rotenberg, G. Meigs, M. H. Prior, S. Daveau, A. Landers, C. L. Cocke, T. Osipov, M. r. Diez, H. Schmidt-Boecking, R. Dorner, Nature, **431**(7007), 437-40(2004).

91. "*Mechanism of Gap Opening in a triple-band Peierls System: In atomic wires on Si*",J. R. Ahn, J. H. Byun, H. Koh, E. Rotenberg, S. D. Kevan, Physical Review Letters, **92**(24), 6402 (2004).

93. "*Electronic States and Spin Density Wave Phase Diagram of Cr(110)*", E. Rotenberg, B. K. Freelon, H. Koh, A. Bostwick, K. Rossnagel, A. Schmid and S. D. Kevan, New J. Phys **7**, 114 (2005),

94. "*Continuous Tuning of Electronic Correlations by Alkali Adsorption on Laered 1T-$TaS_2$*", K. Rossnagel, E. Rotenberg, H. Koh, N. V. Smith, L. Kipp, Phys. Rev.

Lett.**95**(12),126403(2005).

101. "*Resonant interaction between two Cu quantum wells investigated by angle-resolved photoemission spectroscopy*", Y. Z. Wu, C. Won, E. Rotenberg, H. W. Zhao, Qi-Kun Xue, W. Kim, T. L. Owens, N. V. Smith, Z. Q. Qiu, Phys. Rev. B **73**(12),125333 (2006).[Selected by American Institute of Physics / American Physical Society as a research highlight in the Virtual Journal of Nanoscience and Technology link here

102. "*Semiconducting chalcogenide buffer layer for oxide heteroepitaxy on Si(001)*", D. A. Schmidt, T. Ohta, C. Y. Lu, A. A. Bostwick, Q. Yu, E. Rotenberg, F. S. Ohuchi, M. A. Olmstead, Appl. Phys. Lett. **88**(18),181903 (2006).[Selected by American Institute of Physics / American Physical Society as a research highlight in the Virtual Journal of Nanoscience and Technology link here

103. "*Distinct Spinon and Holon Dispersions in photoemission spectral functions from one-dimensional $SrCuO_2$*", B. J. Kim, H. Koh, E. Rotenberg, S. J. Oh, H. Eisaki, N. Motoyama, S. Uchida, T. Tohyama, S. Maekawa, Z. X. Shen, C. Kim, Nature Physics, **2**, 397 (2006).

104. "*Controlling the Electronic Structure of Bilayer Graphene*", T. Ohta, A. Bostwick, T. Seyller, K. Horn, E. Rotenberg, Science **313**(5789)951-4, (2006).

106. "*Universal high energy anomaly in the angle-resolved photoemission spectra of high temperature superconductors:possible evidence of spinon and holon branches*", J. Graf, G. H. Gweon, K. McElroy, S. Y. Zhou, C. Jozwiak, E. Rotenberg, A. Bill, T. Sasagawa, H. Eisaki, S. Uchida, H. Takagi, D. H. Lee, A. Lanzara, Phys. Rev. Lett. **98**(6)067004/1-4(2007).

111. "*Dual Character of the electronic structure of $YBa_2Cu_4O_8$: the conduction bands of $CuO_2$ planes and CuO chains*", T. Kondo, R. Khasanov, J. Karpinski, S.M. Kazakov, N. D. Zhigadlo, T. Ohta, H. M. Fretwell, A. D. Palczewski, J. D. Koll, J. Mesot, E. Rotenberg, H. Keller, A. Kaminski, Phys. Rev. Lett. **98**(15)157002/1-4 (2007).

112. "*Interlayer Interaction and Electronic Screening in Multilayer Graphene Investigated with Angle-Resolved Photoemission Spectroscopy*", T. Ohta, A. Bostwick, J. L. McChesney, T. Seyller, K. Horn, E. Rotenberg, Phys. Rev. Lett. **98**(20)206802 (2007).

115. "*Quasiparticle Dynamics in Graphene*", A. Bostwick, T. Ohta, T. Seyller, K. Horn, E. Rotenberg, Nature Physics **3**(1)36-40 (2007).

## INVITED TALKS AND SEMINARS

*"Surface Core-Level Shifts in $CaF_2$ and $SrF_2$ on Si(111): Expt. and Theory"*

Xerox Palo Alto Research Center, January 1994.

*"Angle-Resolved Photoemission at the Advanced Light Source,"*

Special Seminar, Uppsala University Physics Department, October 29, 1996.
Weekly Seminar (Invited), Fritz-Haber Institute, Berlin, November 1, 1996.

*"Applications of Synchrotron Radiation to Surface Studies of Metals,"*

Weekly Seminar, Pohang Inst. of Science and Tech., Pohang, S. Korea, October , 1997.
Weekly Seminar, Yonsei University Physics Dept., Seoul, S. Korea, October, 1997.

*"Bandmapping and Fermi Surfaces of Surface States"*

ALS/CXRO Seminar, April 28, 1997.

*"Many Body Effects at W(110) and Related Surfaces"*

Brookhaven Natl Lab. Physics Division Weekly Seminar, February 2000.

*"Momentum Resolved Electronic States in i-AlPdMn quasicrystals"*

American Chemical Society National Meeting, San Francisco, March 26, 2000

*"Fermiology of metals from 1 to 6 dimensions"*

8h Intl. Conf. on Electr. Spectr. and Structure (ICESS), Berkeley, CA August 11, 2000.

*"Electronic Properties of self-organized, one-dimensional metal wires on Si(111)"*

Fall 2000 Materials Research Society Meeting, Boston November 29, 2000.

*"Dispersing Electronic States in d-AlNiCo and i-AlPdMn Quasicrystals"*

American Physical Society National Meeting, Seattle, March 16, 2001

*"Dispersion of Valence States in d-AlNiCo"*

Quasicrystals 2001 Meeting, Sendai, Japan, September 27, 2001

*"Surface preparation and Electronic Properties of d-AlNiCo"*

Peter Mark Memorial Award Talk

American Vacuum Society, San Francisco, November 1, 2001

*"The "New" ARPES: State-of-the-art applications of angle-resolved valence band photoemission to magnetic multilayers and metal monolayers"*

Plenary Invited Talk, ICESS-9 (International Conference on Electronic Structure and Spectroscopy), Uppsala, Sweden, July 4, 2003

*"Surfing k-space at the Electronic Structure Factory"*

Invited Talk, Frontiers in Soft X-ray, VUV, and Infrared Research, Madison,Wisconsin, Sept 16-18, 2004.

*"Quantum Size Effects and Angle-Resolved Photoemission"*

Invited Talk, Workshop on Quantum Size Effects, ALS Users' Meeting, 2004.

*"Spin Density Wave Phase Diagram in Cr(110) thin films"*

Invited Talk, Nanomagnetism: New Insights with Synchrotron Radiation, 338th Wilhelm and Else Heraeus Seminar, Bad Honnef Germany, Jan 5-7 2005.

*"nanoARPES:Electronic Structure on the 50 nm length scale"*

Invited Talk, ALS Users Workshop "New Visions in Bandmapping", October 2005.

*"Interface-Driven Phase Transitions in Cr(110) Thin Films"*

Invited Talk, American Vacuum Society Meeting November 2005.

*"NanoARPES:Towards Angle-Resolved Photoemission on the 50 nm Length Scale"*

Invited Talk, SRI2006: Synchrotron Radiation International Meeting, July 2006, Daegu Korea.

*"Bandstructure and Spectral Function of Single and Bilayer Graphene Measured by ARPES"*, Invited Talk, Dynamics and Relaxation in Complex Quantum and Classical Systems and Nanostructures—COQUSY06, Max Planck Institute for Physics of Complex Systems, Dresden. Sept 2006

*"The Electronic Properties of Graphene Films"*

Invited Talk, Columbia University Nanoscale Science and Engineering Center. Nov 8, 2006.

*"The Electronic Properties of Graphene Films"*

Invited Talk, PCSI07 (Physics and Chemistry of Semiconductor Interfaces) Salt Lake City January 14, 2007.

*"The Spectral Function and Quasiparticle Dynamics of Graphene Thin Films"*

Invited Talk, APS07 (American Physical Society March Meeting), March 9, 2007, Denver, CO

*"The Spectral Function and Quasiparticle Dynamics of Graphene Thin Films"*

Invited Talk, IWEPNM07—International Workshop on Electronic Properties of Novel Materials, Kirchberg Austria Mar 10-17 2007. (summary article in Nat. Matls, http://www.nature.com/nmat/journal/v6/n5/full/nmat1898.html)

*"Many Body Interactions in Clean and Alkali-adsorbed Graphene"*

Invited talk, DPG07—German Physical Society Meeting, Regensburg, 27 March 2007

*"Kinkology of Graphene"*

Invited talk, CORPES07, Correlations in Photoelectron Spectroscopy, Max Planck Institute for Physics of Complex Systems, Dresden. 23 April 2007

*"Many Body Interactions in Clean and Alkali-adsorbed Graphene"*

Invited talk, Conference on Quantum Phenomena in Confined Dimensions, International Center for Theoretical Physics, Trieste, Italy, June 7, 2007.

*"Many Body Interactions in Clean and Alkali-adsorbed Graphene"*

Invited Talk, International Workshop "Advanced in Physics and Applicatons of Low-Dimensional Systems", International Center for Condensed Matter Physics, Univ. Brasil, Brasília. July 10, 2007.

## LECTURESHIPS

*"The Band Structure of Solids by Angle-Resolved Photoemission"*
Berkeley-Stanford Summer School in Synchrotron Radiation, July 10 2001.

*"The Band Structure of Solids by Angle-Resolved Photoemission"*
*EE290F, University of California, Prof. D. Attwood.*

## COMPLETE PUBLICATION LIST

(©=Conference Proceeding, ®=Invited Review Article, ☆=E.R. contributed significantly)

### Graduate Work

© 1. *"Atomic and Electronic Structure at Lattice Mismatched Semiconductor/Insulator Interfaces,"* M. A. Olmstead, J. D. Denlinger, E. Rotenberg, R. D. Bringans, J. R. Patel, E. Fontes, in 20th International Conference on the Physics of Semiconductors – Volume I, E. M. Anastassakis and J. D. Joannopoulos, eds. (World Scientific, 1990) 103-106.

2. *"Atomic-Size Effects on the Growth of $SrF_2$ and $(Ca,Sr)F_2$ on Si(111),"* J. D. Denlinger, E. Rotenberg, M. A. Olmstead, J. R. Patel, and E. Fontes, Phys. Rev. **B43** 7335, 1991.

☆ 3. *"Local Field Corrections to Surface and Interface Core-Level Shifts in Insulators,"* Eli Rotenberg and Marjorie A. Olmstead, Phys. Rev. **B46**, 12884-12887, 1992.

4. *"Variable Growth Modes of $CaF_2$ on Si(111) Determined by X-Ray Photoelectron Diffraction,"* J. D. Denlinger, Eli Rotenberg, U. Hessinger, M. Leskovar, and M. A. Olmstead, Applied Physics Letters, **62**(17) 2057, 1993.

☆© 5. *"Surface Core-Level Shifts in $CaF_2$–on–Si(111) Films: Experiment and Theory,"* Eli Rotenberg, J. D. Denlinger, Uwe Hessinger, M. Leskovar, and Marjorie A. Olmstead, J. Vac. Sci. Technol. **B6** (4) 1444, 1993.

6. *"$CaF_2$–Si(111) as a Model Ionic-Covalent System - Transition from Chemisorption to Epitaxy,"* G. C. L. Wong, D. Loretto, C. A. Lucas, Eli Rotenberg and Marjorie A. Olmstead, Physical Review **B48** (8) 5716, 1993.

☆© 7. *"Kinetic Control of $CaF_2$ on Si(111) Growth Morphology,"* J. D. Denlinger, Eli Rotenberg, Uwe Hessinger, M. Leskovar, and Marjorie A. Olmstead (MRS Proceedings, Spring 1993).

☆ 8. *"The Relationship Between Structure and Core-Level Shifts in Thin Epitaxial Films of $CaF_2$ and $SrF_2$ on Si(111),"* PhD Thesis, University of California, 1993.

☆© 9. *"Layer-by-Layer-Resolved Core-Level Shifts in $CaF_2$ and $SrF_2$ on Si(111) – Theory and Experiment,"* Eli Rotenberg, J. D. Denlinger, M. Leskovar, Uwe Hessinger, and Marjorie A. Olmstead, Physical Review **B50** (15) 11052, 1994.

10. "*Growth Kinetics of $CaF_2$/Si(111) Heteroepitaxy - an X-Ray Photoelectron Diffraction Study*," J. D. Denlinger, E. Rotenberg, U. Hessinger, M. Leskovar, and M. A. Olmstead, Physical Review **B51** (8) 5352, 1995.

☆ 11. "*Altered Photoemission Satellites at $CaF_2$– and $SrF_2$–on–Si(111) Interfaces*," Eli Rotenberg, J. D. Denlinger, and Marjorie A. Olmstead, Physical Review **B53** (3) 1584, 1996.

### Post-graduate publications

☆© 12. *"First Results from the Spectromicroscopy Beamline at the Advanced Light Source,"* J. D. Denlinger, E. Rotenberg, T. Warwick, G. Visser, et al. Review of Scientific Instrument **66**(2), 1342-1345.

☆© 13. *"Surface Core-level Photoelectron Diffraction of Surface Reconstructions,"* E. Rotenberg, J. D. Denlinger, S. D. Kevan, B. P. Tonner, in "Applications of Synchrotron Radiation

Techniques to Materials Science II," Fall 1995 Proceedings, p. 145-150.

14. *"Resonant Excitation of X-Ray Fluorescence from $C_{60}$,"* J. H. Guo, P. Glans, P. Skytt, N. Wassdahl, J. Nordgren, E. Rotenberg, et al, Physical Review **B52**(15), 10681-10684 (1995).

15. *"The Development of Electron Spectromicroscopy,"* Tonner, B.P., D. Dunham, T. Droubay, J. Kikuma, J. D. Denlinger, E. Rotenberg, T. Warwick, et al., Journal of Electron Spectroscopy and Related Phenomena, **75**, 309 (1995).

☆ 16. *"Local Field Effects on Photoemission of* $C_{60}$*,"* Eli Rotenberg, C. Enkvist, P. A. Brühwiler, A. J. Maxwell, and Nils Mårtensson, Physical Review **B54** (8) R5279-5282 (1996).

17. *"Resonant X-Ray Emission Spectroscopy of Molecular Oxygen,"* P. Glans, K. Gunnelin, P. Skytt, J. H. Guo, N. Wassdahl, J. Nordgren, H. Ågren, F. Kh. Gel'mukhanov, T. Warwick, and Eli Rotenberg, Physical Review Letters, **76**(14)2448-2451 (1996).

18. *"Ratio of Cross Sections for Double to Single Ionization of He by 85-400 eV Photons,"* R. Dörner, T. Vogt, V. Mergel, H. Khemliche, S. Kravis, C. L. Cocke, J. Ullrich, M. Unverzagt, L. Spielberger, M. Damrau, O. Jagutzki, I. Ali, B. Weaver, K. Ullmann, C. C. Hsu, M. Jung, E. P. Kanter, B. Sonntag, M. H. Prior, E. Rotenberg, J. Denlinger T. Warwick, S. T. Manson, and H. Schmidt-Böcking, Physical Review Letters, **76**(15)2654-2657 (1996).

☆© 19. *"Complete k-space Visualization of X-ray Photoelectron Diffraction,"* J. D. Denlinger, E. Rotenberg, S. D. Kevan, B. P. Tonner, in "Applications of Synchrotron Radiation Techniques to Materials Science III," Spring 1996 Proceedings, **437**, p. 3-7.

☆© 20. *"Fermi Surface Mapping Using a Third Generation Light Source,"* Eli Rotenberg, K. H. Jeong, S. D. Kevan, J. D. Denlinger, B. P. Tonner, G. Mankey, and K. Subramanian, in "Applications of Synchrotron Radiation Techniques to Materials Science III," Spring 1996 Proceedings, **437**, p. 47-52.

© 21. *"Correlation of Magnetic Dichroism in X-ray Absorption and Photoelectron Emission Using Ultrathin Magnetic Alloy Films,"* J. G. Tobin, K. W. Goodman, G. J. Mankey, R. F. Willis, J. D. Denlinger, E. Rotenberg, and A. Warwick, in "Applications of Synchrotron Radiation Techniques to Materials Science III," Spring 1996 Proceedings, **437**, p. 61-5.

© 22. *"Magnetic X-Ray Dichroism in the Spectroscopy of Ultrathin Magnetic Alloy Films,"* J. G. Tobin, K. W. Goodman, G. J. Mankey, R. F. Willis, J. D. Denlinger, E. Rotenberg, et al. Journal of Vacuum Science and Technology **B14**(4), 3171-3175 (1996).

© 23. *"Magnetic X-ray Linear Dichroism in the Photoelectron Spectroscopy of Ultrathin Magnetic Alloy Films,"* J. G. Tobin, K. W. Goodman, G. J. Mankey, R. F. Willis, J. D. Denlinger, E. Rotenberg, and A. Warwick, [MMM Conference] Journal of Applied Physics **79**(8, pt. 2B) 5626-5628 (1996).

☆ 24. *"Difffraction and Holography with Photoelectrons and Fluorescent X-rays,"* C. S. Fadley, Y. Chen, R. E. Couch, H. Daimon, E. Rotneberg, et al., Progress in Surface Science, **54**(3-4), 341-386 (1997).

© 25. *"Generalized Description of Magnetic X-ray Circular Dichroism in Fe 3p Photoelectron Emission,"*J. G. Tobin, K. W. Goodman, F. O. Schumann, R. F. Willis, J. D. Denlinger, E. Rotenberg, et al. Journal of Vacuum Science and Technology **A15**(3 Pt. 2) 1766-1769

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© 26. *"Comparison of Magnetic Linear Dichroism in 4f Photoemission and 4d-4f Photoemission from Gd on Y(0001),"* W. J. Gammon, S. R. Mishra, D. P. Pappas, K. W. Goodman, J. G. Tobin, J. D. Denlinger, E. Rotenberg, et al. Journal of Vacuum Science and Technology **A15**(3 Pt. 2) 1755-1758 (1997).

☆ 27. *"Observation of Quantum Well Interference in Magnetic Nonostructures by Photoemission,"* R. K. Kawakami, E. Rotenberg, E. J. Escorcia-Aparicio, H. J. Choi, T. R. Cummins, J. G. Tobin, N. V. Smith, and Z. Q. Qiu, Physical Review Letters, **80**(8), 1754-1757 (1998).

28. *"Direct Extraction of Exchange Splittings from Magnetic X-ray Dichroism in Photoelectron Spectroscopy,"* J. G. Tobin, K. W. Goodman, F. O. Schumann, R. F. Willis, J. D. Denlinger, E. Rotenberg, et al., Surface Science **395**(2-3), L227-235 (1998).

☆ 29. *"Evolution of Fermi Level Crossings vs H Coverage on W(110)*," Physical Review Letters **80**(13), 2905-2908 (1998).

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