

## CURRICULUM VITAE: Laurence Daniel MARKS

**Date of Birth:** 4 July 1954

**Education:** 1973-1976 University of Cambridge, B.A. 1976  
1976-1980 Research student at the Cavendish Laboratory,  
Cambridge  
1980 Ph.D., University of Cambridge  
Thesis entitled "The structure of small silver  
particles"

### **Professional Career:**

1980-1983 Post doctoral research assistant  
Cavendish Laboratory (Dept. of Physics),  
University of Cambridge  
1983-1985 Post doctoral research assistant, Department of  
Physics Arizona State University  
March 1985 Assistant Professor  
June 1986 Associate Professor  
June 1992-2023 Professor, Department of Materials, Science &  
Engineering, Northwestern University  
Sept 2023- Emeritus Professor

**Email** [Laurence.marks@gmail.com](mailto:Laurence.marks@gmail.com)

**Web** [www.numis.northwestern.edu](http://www.numis.northwestern.edu)

**Wikipedia** [en.wikipedia.org/wiki/Laurence\\_D.\\_Marks](https://en.wikipedia.org/wiki/Laurence_D._Marks)

**Google Scholar** [scholar.google.com/citations?user=zmHhI9gAAAAJ](https://scholar.google.com/citations?user=zmHhI9gAAAAJ)

**Citations** 40,310 **H-Index** 78

### **Awards and Honors:**

Fulbright Fellow, Curtin University, 2024  
Visiting Fellow, Linacre College, Oxford, 2019  
ICSOS Surface Structure Prize, 2017  
Fellow, Microscopy Society of America, 2017  
Astor Visiting Lecturer, University of Oxford, 2015  
Warren Award, American Crystallographic Association, 2015  
Fellow, American Physical Society, 2001  
Burton Medal, Electron Microscopy Society of America, 1989  
Sloan Foundation Fellowship 1987  
Scholarship, Kings College, University of Cambridge 1976

### **Current Research Interests (Alphabetical Order):**

#### **Corrosion**

Understanding the early stages of corrosion, both high temperature oxidation and aqueous;  
Solute Trapping; Cabrera-Mott models; Morphological Instabilities

#### **Density Functional Theory**

Mixing and Optimization Algorithms, Oxide Surfaces, Flexoelectric Effects

### **Electron Microscopy**

Precession Electron Diffraction; Surface Imaging in an Electron Microscope; Dynamical Diffraction; In-Situ Microscopy; Direct Methods for Bulk Materials; Charge Density Measurements.

### **Flexoelectric Phenomena**

Understanding the role of flexoelectric in a range of materials, including how it can be used for energy harvesting.

### **Nanoparticles**

Role of structure and shape on surface plasmonics; nucleation and growth of nanoparticles; thermodynamics and Wulff constructions; Catalysis; Nanoplasmonics.

### **Oxide Surfaces**

Structure, Kinetics and Energetics of Oxide Surfaces; Predictive Rules for Oxide Surfaces; Direct Methods with Electrons or X-rays; Corrosion

### **Triboelectricity**

Understanding the link of flexoelectricity to triboelectricity, including predicting the generation of static electricity in a range of scientific and commercial applications.

### **Tribology**

The Role of Dislocations in Nanoscale Tribological Properties; In-Situ Tribology; Metal-on-Metal Hip Replacements

## **Completed PhD Students**

**Ajayan, Pulichek** (1989), *Phase instabilities in small particles.*

**Ma, Yiquan** (1990) *Dynamical theory for high energy electron reflection.*

**Bonevich, John** (1991), *Atomic structure and sintering behavior of ultrafine ceramic particles.*

**Buckett, Mary** (1991), *Electron radiation damage in transition metal oxides.*

**Derren Dunn** (1992) *Ultra high vacuum transmission electron microscopy of the clean surfaces of Au and Ir (001).*

**Ai, Rebecca** (1992), *Electron-induced surface radiation damage in  $V_2O_5$ ,  $ReO_3$  and  $CaF_2$ .*

**Narayanaswamy, Dorai** (1995) *Morphology transformations in nanoparticles.*

**Jayaram, Ganesh** (1995) *Ultrahigh vacuum transmission electron microscopy studies of semiconductor surfaces.*

**Vuchic, Boris** (1995) *The formation, transport properties and microstructure of  $45^\circ$  [001] tilt grain boundaries in  $YBa_2Cu_3O_{7-x}$  thin films.*

**Plass, Richard** (1996) *Gold induced Si(111) surface reconstructions studied by ultrahigh vacuum transmission electron microscopy.*

**Storey, Brad** (1996) *Microstructure and composition of magnetic flux pinning defects in high-temperature superconductors.*

**Collazo-Davila, Christopher** (1998) *Initial stages of thin film deposition : metal-induced surface reconstruction on semiconductors and the nucleation of cubic boron nitride.*

**Landree, Eric** (1998) *Structural and chemical characterization of thin films and crystal surfaces.*

**Bengu, Erman** (2000) *Experimental and computational study of surfaces, interfaces and thin films.*

**Grozea, Daniel** (2000) *Initial growth of ultrathin metal films on semiconductors.*

**Carmody, Michael** (2000) *The local variation of the critical current along YBa<sub>2</sub>Cu<sub>3</sub>O<sub>7-x</sub> grainboundary and ramp-edge Josephson junctions.*

**Li, Quan** (2001) *Nucleation and growth of metastable phases in thin films.*

**Erdman, Natasha** (2002), *Structure, morphology and chemistry of catalytic transition metal oxides.*

**Edy Widjaja** (2004) *Quasicrystalline thin films : growth, structure and interface.*

**Arun Subramanian** (2004) *Charge Density at Oxide Surfaces*

**Ann Chiamonti** (2005) *Surfaces of Catalytically Relevant Oxides*

**Chris Own** (2005) *Precession Electron Diffraction*

**Yingmin Wang** (2006) *Catalysis by Gold Nanoparticles*

**Arno Merkle** (2006) *Nanotribology*

**Courtney Lanier** (2007) *Real and Model Oxide Surfaces*

**Robin Koshy** (2008) *Thermally Activated Self-lubricating Nanostructured Coating for Cutting Tool Applications*

**Paramita Mondal** (2008) *Nanoscale Properties and Mechanics of Cementitious Materials*

**James Ciston** (2009) *Crystallographic perturbations to valence charge density and hydrogen-surface interactions*

**James Enterkin** (2010) *A Chemical Approach to Understanding Oxide Surface Structure and Reactivity*

**Brian Quezada** (2010) *Strontium Titanate Surfaces*

**Andres E. Becerra-Toledo** (2011) *Surface Stabilization Mechanisms in Metal Oxides*

**Emilie Ringe** (2012) *Building the Nanoplasmonics Toolbox Through Shape Modeling and Single Particle Optical Studies*

**M'ndange-Pfupfu, Ariel** (2012) *Structural and Chemical Investigations of Nanotribology Using In Situ Transmission Electron Microscopy and Defect Based Analytical Modeling*

**Danielle Kienzle** (2013) *Surface Reconstructions of Oxides*

**Yuyuan Lin** (2014) *Atomic Surface Structures of Oxide Materials: From Single Crystals to Nanoparticles*

**Chuandao Wang** (2014) *Atomically-Precise Synthesis of Platinum Catalysts on Strontium Titanate using Atomic Layer Deposition*

**Emily Hoffman** (2017) *Tribology and Corrosion in CoCrMo Alloys and Similar Systems*

**Betty Peng** (2017) *Shape, Thermodynamics, Kinetics and Growth Mechanisms of Metal and Bimetallic Nanoparticles*

**Pratik Koirala** (2017) *Oxide Surfaces and Flexoelectric Effects*

**Tassie Andersen** (2018) *Understanding Atomic Structure and Structural Evolution of Perovskite Oxides at the 2-D Limit: From Surface to Thin Film*

**Say Cook** (2018) *Defect Induced Behavior in Complex Oxides*

**Lawrence Crosby** (2018) *Synthesis, Shape, and Surfaces of Strontium and Barium Titanate Nanocrystals*

**Alex Lin** (2020) *Nanoscale Corrosion and Tribology Mechanisms in CoCrMo Alloys and Associated Systems*

**Ryan Paull** (2020) *Lanthanide Scandate Supported Noble Metal Nanoparticle Catalysts*

**Tiffany Ly** (2021) *Oxide Nanoparticles and Surfaces*

**Christopher Mizzi** (2021) *Experimental and Theoretical Studies on Flexoelectricity*

**Zachary Mansley** (2021) *Identifying Support Effects in Nanoparticle Catalysis*

**Emily Greenstein** (2023) *Lanthanide Scandate Supports For Heterogeneous Catalysis*

**Karl Olson** (2024) The Relationship between Flexoelectricity and Triboelectricity

**Postdoctoral or Visiting Scientists to date (Chronological)**

D. E. Luzzi, J. P. Zhang, H. Shibahara, J. Singh, H. J. Fan, D. J. Li, H. Zhang, P. Xu, V. A. Volpert, W. Sinkler, C. Leslie, J. J. Hu, F. N. Chukhovskii, R. Kilaas, B. Deng, Y. Wang, S. Esvara Moorth, Y. Liao, H. Amari, Victor Zenou, Yifeng Liao, Ahmet Gulec, X. Yu, E. Long, Marshal Amal, Quingshan Dong

**Talks from 2000-** (Invited only)

**2000**

*UHV Electron Microscopy of Surfaces*, 6th International Symposium on Inorganic Materials, Tokyo, Japan (3/2/00)

*Growth of Single-Wall Boron Nitride Nanotubes & Nanostructures*, 5th International Symposium on Advanced Physical Fields, Fabrication & Characterization of Atomic Scale Structures, Tsukuba, Japan (3/6/00 - 3/9/00)

*Direct Methods of Imaging Surfaces*, Workshop on Electron Holography and Other Direct Methods, Hong Kong (8/11/00-8/18/00)

*Transportation Nanotechnology*, Exxon Corporation, Clinton, NJ, December 2000

*Nucleation and Growth of BN Nanostructures*, Aerospace Corporation, Los Angeles, CA December 2000.

*Direct Methods*, LBL, Berkley, CA, December 2000.

**2001**

*Feasible-Sets, and the General Phase Problem*, Phase Problem for Non-Periodic Objects, Berkley, CA, May 2001.

*Nucleation and Growth of Quasicrystalline Thin Films*, AFOSR contractors meeting, Florida, July 2001.

*Direct Methods for Surfaces*, Annual Catalysis Center Meeting, Evanston, IL September, 2001.

**2002**

*Direct Methods with Electrons*, American Crystallographic Association, San Antonio, May 2002

*In-Situ microscopy*, NTEAM-11 workshop, Berkeley, June 2002

*Charge Density at Surfaces*, ICSOSS-9, Newcastle, Australia, June 2002

*Feasible Sets*, International Union of Crystallography, Zurich, July 2002

*Electron Microscopy of Surfaces*, International Conference on Electron Microscopy, Durban, South Africa, August 2002

*The Scientist, the Immigrant and the Ombudsman*, keynote lecture, United States Ombudsman Association Annual Meeting, October 2002

*UHV Micrography of Surfaces*, ICEM Conference, Durban, S. Africa, 9/02

**2003**

*Transportation Nanotechnology*, FWHA, Washington, DC, April 2003

*Direct Methods with Electrons*, Electron Crystallography School, Moscow, June 2003

**2004**

- Direct Methods with Electrons*, First NCEM Crystallography School, April 2004,  
*Charge Transfer at Oxide Surfaces*, Electronic Materials Conference, Notre Dame, May 2004  
*Nanotribology and Quasicrystalline Interfaces*, Irsee Conference, May 2004  
*Charge Density at Oxide Surfaces*, Gordon Conference, July 2004  
*Oxide Surfaces*, Gordon Research Conference, July 2004  
*Prospects for Aberration Corrected Precession Diffraction*, TEAM Session, Savannah, Georgia, August 2004  
*Charge Transfer at an MgO Surface*, Microscopy Society of American Annual Meeting, Savannah, Georgia, August 2004  
*Oxides: From Structure to Chemistry*, University of Washington, August 2004
- 2005**
- Precession Electron Diffraction*, Oxford, UK, January 2005  
*Imaging Surfaces with Electrons*, McMaster, Canada, February 2005  
*Imaging Surfaces with Electrons*, Champaign-Urbana, Midwest Microscopy Meeting, June 2005  
*Precession Electron Diffraction*, ACA Meeting, Orlando, Florida, June 2005  
*Experimental Charge Densities at Surfaces*, IUCR Meeting, Florence, Italy, August 2005  
*Surfaces, Finding the Atoms then Finding the Electrons*, Nancy, France, August 2005  
*Dynamical Direct Methods ; Precession Electron Diffraction*, Brussels, Belgium, September 2005, School on Electron Crystallography
- 2006**
- Examining Surfaces at the Nanoscale*, Ankara, Turkey, May 2006  
*Electron Diffraction: Synergies*, ELCRYST School on Electron Crystallography, Antwerp, August 2006  
*Charge, Glowing in the Dark*, Chinese Microscopy Meeting, Shengyang, August 2006  
*Charge Glowing in the Dark*, ICEM, Sapporo, Japan, August 2006  
*Precession Electron Diffraction*, Pittsburg Diffraction Conference, October 2006
- 2007**
- What DFT Teaches Surfaces and Surfaces Teach DFT*, Wien2k School, Penn State Univ  
*Friction in Full View*, Berkeley Nanomechanics meeting, July 2007  
*Charge Density at Surfaces*, EMMM2007, Moscow, September 2007  
*Friction in Full View*, Seattle, AVS, October 2007  
*Precession Electron Diffraction*, IUCR Crystallography School, Taiwan, November 2007
- 2008**
- Oxide Surfaces*, Korea, February 2008  
*Friction in Full View*, Argonne National Labs, May 2008  
*Robust Mixing for DFT*, SIAM Conference, Philadelphia, May 2008  
*Friction in Full View*, Tribology Gordon Conference, July 2008  
*Direct Methods for Surfaces*, ICSOSS, Brazil, August 2008  
*Friction in Full View*, Nagoya IUCR Satellite Meeting, September 2008

- Oxide Surfaces*, Lehigh University, September 2008  
*Friction in Full View*, Sikkim Discussions, Sikkim, India, November 2008
- 2009**
- Friction in Full View*, Yale University, February 2009  
*Friction in Full View*, Heraeus Seminar, Bad Honnef, Germany, March 2009  
*Oxide Surfaces*, Spring MRS Meeting, April 2009  
*Oxide Surfaces*, APS, Argonne National Labs, April 2009  
*Precession Electron Diffraction*, Lille School, France, July 2009  
*Oxide Surfaces*, EMC25, Istanbul, Turkey, August 2009  
*Friction in Full View*, UTRC, September 2009  
*Quantitative Microscopy*, AEM-NANOMAT'09, Saltillo, Mexico, September 2009  
*Friction in Full View*, *ibid*  
*Oxide Surfaces*, ETH Zurich, October 2009  
*Oxide Surfaces*, UIC, November 2009
- 2010**
- Correlated TEM and Optical Surface Plasmon Measurements*, Rio de Janeiro, IMC-7, September 2010  
*Correlated TEM and Optical Surface Plasmon Measurements*, Osaka, Japan, October 2010  
*Correlated TEM and Optical Surface Plasmon Measurements*, Nagoya, Japan, October 2010  
*Oxide Surfaces*, University of Wisconsin, Madison, September 2010  
*Tribology in Full View*, McGill University, Canada, October 2010  
*Tribology in Full View*, MP3 Workshop, Illinois, October 2010
- 2011**
- The Phase Problem in Electron Crystallography*, Erice School, Sicily, June 2011  
*Models for Precession Electron Diffraction*, *ibid*  
*Mixing and Minimization*, Wien2k School, Penn State, July 2011  
*Correlated TEM and Optical Surface Plasmon Measurements*, EM50, Hyderabad, July 2011  
*Solving Structures from Diffraction Data*, MSA, Nashville, August 2011  
*Direct Methods for Surfaces*, IUCR Triannual Meeting, Madrid, September 2011
- 2012**
- Tribology in Full View*, Beijing, January 2012  
*Tribology in Full View*, Korea, January 2012  
*Tribology of Carbons*, Gordon Research Conference, June 2012  
*Nanoparticles: UTSA*, 2012  
*Nanoparticles: From Wulff to Winterbottom and Beyond*, MP0903, Brno, March 2012  
*Oxide Surfaces*, Wien Technical University, March 2012  
*Nanoparticles: From Wulff to Winterbottom and Beyond*, TOFA, September 2012  
*Oxide Surfaces*, TMS, Pittsburg, October 2012  
*Nanoparticles: From Wulff to Winterbottom and Beyond*, U. Colorado, November 2012  
*Nanotribology*: NIST, November 2012

## 2013

*Advanced Electron Microscopy*, UC Irvine, Jan 2013  
*Oxide Surfaces*, ACS, New Orleans, April 2013  
*Tribology in Full View*, 4th International Workshop on Remote Electron Microscopy and In Situ Studies, Portugal, May 2013  
*DFT Mixing*, SIAM Conference, Philadelphia, June 2013  
*Tribology in Full View*, Drexel University, June 2013  
*Hip Implants*, Advances in scanning transmission electron microscopy, Tennessee, August 2013  
*Nanoplasmonics*, EMAG, York, September 2013  
*Solving the Phase Problem*, PICO 2013, October 2013  
*Friction in Full View*, AVS 2013, Long Beach CA, November 2013  
*The Pandora's Box of Perovskite Surfaces*, Argonne National Labs, November 2013  
*Nanoplasmonics & Nanotribology*, Seagate, November 2013  
*Oxides Surfaces and Nanoparticles: from Atomic Surface Structure to Thermodynamically Stable Face Selective Catalysis*, UCLA, November 2013

## 2014

*Oxide Surfaces*, IMEC16, Haifa, Israel, February 2014  
*Friction in Full View*, CIMTEC 2014, Montecatini Terme, Italy, June 2014  
*Nanoparticle Thermodynamics*, Catalysis Gordon Conference, Colby-Sawyer College, June 2014  
Three Lectures, MSA Preconference School on Diffraction, Hartford, August 2014  
*From Wulff to Winterbottom and Beyond*, IUCR, Montreal, August 2014  
*Oxide Surfaces*, YUCOMAT, Montenegro, October 2014  
*Electron Crystallography*, International Symposium on Crystallography, Fortaleza, Brazil, October 2014  
*Advanced Electron Microscopies*, Duisberg-Essen, Germany, November 2014

## 2015

*Nanoparticles and Nanoalloys*, ISSC-20, Birmingham, March 2015  
*Oxide Surfaces, Opening the Pandora's Box for SrTiO<sub>3</sub>*, MPM-1, Hangzhou, China, May 2015  
*Surfaces and Growth In-Situ: From Structure to Designed Nanostructures*, SINANO, Suzhou, China, May 2015  
*Electron Crystallography*, Warren Award Lecture, Philadelphia, July 2015  
*New Tools for Surfaces*, NIMS, Tsukuba, Japan, July 2015  
*New Tools for Surfaces*, UniCat Meeting, Northwestern University, August 2015  
*Understanding Nanoparticles*, Rice University, September 2015  
*Oxide Surfaces*, MS&T October 2015  
Astor Lectures, October 2015  
*Corrosion: rust with 21<sup>st</sup> century tools*  
*Oxide surfaces: opening the Pandora's Box*  
*Nanoparticles: from thermodynamics and shape to plasmonics and catalysis*  
*Tribology in Full View*, 2015 STLE Tribology Frontiers Conference

## 2016

- Tribology in Full View*, Heraus Conference, March 2016  
*Nanoparticles, from Plasmonics to Catalysis*, ASU, April 2016  
*Corrosion in 4D*, June 2016  
*Oxide Surfaces*, 4th International Workshop on Complex Oxides, June 2016  
*Advanced TEM of Surfaces*, ICMAT, Brazil, November 2016
- 2017**  
*Unexpected Flexoelectric Effects in Rare Earth Scandates*, Kolkata, Jan 2017  
*Rust with 21st Century Tools*, IBTN Keynote Lecture, Feb 2017  
*Crystallography of Nanoparticles*, ACA, April 2017  
*Pauling's Rules for Oxide Surfaces*, ICSOSS, July 2017  
*Chloride in Corrosion*, Yucomat, September 2017  
*Carbon, carbon everywhere, from catalysts to hip implants*, AVS, Oct 2017
- 2018**  
*Understanding Atomic Scale Structure in Four Dimensions to Design and Control Corrosion Resistant Alloys*, Northwestern/Tel Aviv Workshop, July 2018  
*Unexpected Flexoelectric Effects in Rare Earth Scandates*, Belgrade, Aug 2018  
*Unexpected Flexoelectric Effects in Rare Earth Scandates*, Moscow, Aug 2018  
*Simultaneous Structure and Composition: Nonequilibrium Solute Capture*, UIUC, Dec 2018
- 2019**  
*Understanding the role of Chloride in Corrosion: DFT, TEM and Morphological Instabilities*, Manchester University, April 2019  
*In-Situ TEM of Tribology*, MRS 2019 Spring Meeting, April 2019  
*Understanding the role of Chloride in Corrosion: DFT, TEM and Morphological Instabilities*, Cambridge University, May 2019  
*Flexoelectricity & Complex Physics in LnScO<sub>3</sub>*, PICO 2019, May 2019  
*NonEquilibrium Solute Capture in Oxidation and Corrosion*, MMC2019, Manchester, July 2019  
*Oxide Surfaces*, Sinano, Suzhuo, August 2019  
*Nanoparticle Synthesis and Crystal Growth -- Are They Different?* Sinano, Suzhou, August 2019  
*Surface And Growth Morphologies Of Solid Solution Nanoparticles*, IMRC 2019, August 2019  
*Does Flexoelectricity Drive Triboelectricity?* Washington Univ, October 2019
- 2022**  
*Where did that charge come from, Dissipation mechanisms in nano/mesoscale tribological systems*, Trieste 2022  
*Where did that charge come from*, ELMINA 2022, August 2022  
*From Imaging to Heterogeneous Catalysis: Nanoparticles and Supports*, ACS 2022  
*Reinventing the importance of mean-inner potential; Static Electricity*, John Spence Symposium, ASU, October 2022
- 2023**  
*Oxide Interfaces and Charge Transfer*, 6th International Workshop on Complex Oxides, June 2023



*DFT Mixing for not-so-dummies*, ICERM Workshop: Acceleration and Extrapolation Methods, July 2023

*Why is there Tribo in Triboelectricity?* Leeds-Lyon Conference in Tribology, September 2023

**2024**

*Some new aspects of corrosion*, Corrosion Center, Perth University, March 2024

*Where did that charge come from?*, Perth University, Chemistry colloquium, April 2024

*DFT Mixing for dummies*, Wien2k workshop (remote), April 2024

*Understanding oxide surfaces*, Wien2k workshop (remote), April 2024

*Where did that charge come from*, Advanced Energy Materials and Devices, Shanghai, October 2024

**2025**

*Where did that charge come from*, Rice University, March 2025

*Foundations of Electron Crystallography*, Northwestern University, April 2025

*Microscopy when everything is nasty*, MSA meeting, Salt Lake City, July 2025

## Publications

1. Marks, L.D. and A. Howie, *Multiply-Twinned Particles in Silver Catalysts*. Nature, 1979. **282**(5735): p. 196-198 <https://doi.org/10.1038/282196a0>.
2. Marks, L.D., *The structure of small silver particles*. 1980: University of Cambridge.
3. Marks, L.D. and D.J. Smith, *High-Resolution Studies of Small Particles of Gold and Silver .1. Multiply-Twinned Particles*. Journal of Crystal Growth, 1981. **54**(3): p. 425-432 [https://doi.org/10.1016/0022-0248\(81\)90494-2](https://doi.org/10.1016/0022-0248(81)90494-2).
4. Smith, D.J. and L.D. Marks, *High-Resolution Studies of Small Particles of Gold and Silver .2. Single-Crystals, Lamellar Twins and Polyparticles*. Journal of Crystal Growth, 1981. **54**(3): p. 433-438 [https://doi.org/10.1016/0022-0248\(81\)90495-4](https://doi.org/10.1016/0022-0248(81)90495-4).
5. Smith, D.J. and L.D. Marks, *Direct Lattice Imaging of Small Metal Particles*. Philosophical Magazine a-Physics of Condensed Matter Structure Defects and Mechanical Properties, 1981. **44**(3): p. 735-740 <https://doi.org/10.1080/01418618108236175>.
6. Howie, A., L.D. Marks, and S.J. Pennycook, *New Imaging Methods for Catalyst Particles*. Ultramicroscopy, 1982. **8**(1-2): p. 163-174 [https://doi.org/10.1016/0304-3991\(82\)90285-6](https://doi.org/10.1016/0304-3991(82)90285-6).
7. Marks, L.D., *Observation of the Image Force for Fast Electrons near an Mgo Surface*. Solid State Communications, 1982. **43**(10): p. 727-729 [https://doi.org/10.1016/0038-1098\(82\)90979-6](https://doi.org/10.1016/0038-1098(82)90979-6).
8. Marks, L.D., *Direct Imaging of Carbon-Covered and Clean Gold (110) Surfaces*. Physical Review Letters, 1983. **51**(11): p. 1000-1002 <https://doi.org/10.1103/PhysRevLett.51.1000>.
9. Marks, L.D., *Modified Wulff Constructions for Twinned Particles*. Journal of Crystal Growth, 1983. **61**(3): p. 556-566 [https://doi.org/10.1016/0022-0248\(83\)90184-7](https://doi.org/10.1016/0022-0248(83)90184-7).
10. Marks, L.D. and D.J. Smith, *HREM and STEM of Defects in Multiply-Twinned Particles*. Journal of Microscopy, 1983. **130**(May): p. 249-261 <https://doi.org/10.1111/j.1365-2818.1983.tb04222.x>.
11. Marks, L.D. and D.J. Smith, *Direct Surface Imaging in Small Metal Particles*. Nature, 1983. **303**(5915): p. 316-317 <https://doi.org/10.1038/303316a0>.
12. Howie, A. and L.D. Marks, *Elastic Strains and the Energy-Balance for Multiply Twinned Particles*. Philosophical Magazine a-Physics of Condensed Matter Structure Defects and Mechanical Properties, 1984. **49**(1): p. 95-109 <https://doi.org/10.1080/01418618408233432>.
13. Marks, L.D., *Bloch Wave HREM*. Ultramicroscopy, 1984. **14**(4): p. 351-355 [https://doi.org/10.1016/0304-3991\(84\)90220-1](https://doi.org/10.1016/0304-3991(84)90220-1).
14. Marks, L.D., *Direct Atomic Imaging of Solid-Surfaces .1. Image Simulation and Interpretation*. Surface Science, 1984. **139**(1): p. 281-298 [https://doi.org/10.1016/0039-6028\(84\)90022-0](https://doi.org/10.1016/0039-6028(84)90022-0).
15. Marks, L.D., *Dispersive Equations for High-Resolution Imaging and Lattice Fringe Artifacts*. Ultramicroscopy, 1984. **12**(3): p. 237-242 [https://doi.org/10.1016/0304-3991\(83\)90264-4](https://doi.org/10.1016/0304-3991(83)90264-4).
16. Marks, L.D., *Surface-Structure and Energetics of Multiply Twinned Particles*. Philosophical Magazine a-Physics of Condensed Matter Structure Defects and Mechanical Properties, 1984. **49**(1): p. 81-93 <https://doi.org/10.1080/01418618408233431>.
17. Marks, L.D., *And the image was simulated*. Ultramicroscopy, 1984. **14**(4): p. 317 [https://doi.org/10.1016/0304-3991\(84\)90216-x](https://doi.org/10.1016/0304-3991(84)90216-x).

18. Marks, L.D., V. Heine, and D.J. Smith, *Direct Observation of Elastic and Plastic-Deformations at Au(111) Surfaces*. Physical Review Letters, 1984. **52**(8): p. 656-658 <https://doi.org/10.1103/PhysRevLett.52.656>.
19. Marks, L.D. and D.J. Smith, *Direct Atomic Imaging of Solid-Surfaces .2. Gold (111) Surfaces during and after Insitu Carbon Etching*. Surface Science, 1984. **143**(2-3): p. 495-508 [https://doi.org/10.1016/0039-6028\(84\)90555-7](https://doi.org/10.1016/0039-6028(84)90555-7).
20. Marks, L.D., *Image Localization*. Ultramicroscopy, 1985. **18**(1-4): p. 33-37 [https://doi.org/10.1016/0304-3991\(85\)90119-6](https://doi.org/10.1016/0304-3991(85)90119-6).
21. Marks, L.D., *Imaging small particles*. Ultramicroscopy, 1985. **18**(1-4): p. 445-452 [https://doi.org/10.1016/0304-3991\(85\)90164-0](https://doi.org/10.1016/0304-3991(85)90164-0).
22. Marks, L.D., *Direct Observation of Diffractive Probe Spreading*. Ultramicroscopy, 1985. **16**(2): p. 261-264 [https://doi.org/10.1016/0304-3991\(85\)90080-4](https://doi.org/10.1016/0304-3991(85)90080-4).
23. Marks, L.D., *Inhomogeneous Strains in Small Particles*. Surface Science, 1985. **150**(2): p. 302-318 [https://doi.org/10.1016/0039-6028\(85\)90648-X](https://doi.org/10.1016/0039-6028(85)90648-X).
24. Marks, L.D., *Particle-Size Effects on Wulff Constructions*. Surface Science, 1985. **150**(2): p. 358-366 [https://doi.org/10.1016/0039-6028\(85\)90652-1](https://doi.org/10.1016/0039-6028(85)90652-1).
25. Marks, L.D. and V. Heine, *Electronically Induced Geometrical Catalytic Effects*. Journal of Catalysis, 1985. **94**(2): p. 570-572 [https://doi.org/10.1016/0021-9517\(85\)90223-4](https://doi.org/10.1016/0021-9517(85)90223-4).
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