

ACADEMIC AND RESEARCH POSITIONS

- 2000 – **Paul Whitfield Horn Professor**, Texas Tech University
 1996 – 2000 **Professor**, Physics Department, Texas Tech University
 Fall 1995 **Visiting Professor**, Max-Planck Institute, Stuttgart
 1991 – 1996 **Associate Professor**, Physics Department, Texas Tech University
 1986 – 1991 **Assistant Professor**, Physics Department, Texas Tech University
 1985 – 1986 **Assistant Professor** (non tenure-track), Physics and Elec. Engr., Rice University
 1983 – 1985 **R.A. Welch Postdoctoral Fellow**, Physics Department, Rice University
 1982 **PhD** in Physics, University of Zürich (Switzerland)
 1978 **MS** in Physics, University of Geneva (Switzerland)

HONORS

- 2018 – 2020 **Spokesperson** of the Horn Professors at Texas Tech (elected).
 2012 **Scientist of the Year, ARCS** (Achievement Rewards for College Scientists), Lubbock Chapter
 2008 **President's Book Award** (*Wine: from Neolithic Times to the 21st Century*, Algora, NY 2006)
 2006 **Fellow Institute of Physics** (UK)
 2001 **Humboldt Research Award** (Friedrich Wilhelm Bessel Prize)
 2010: travel grant from the Humboldt Foundation for a month trip to Germany
 2017: travel grant from the Humboldt Foundation for a two-months trip to Germany
 2000 **Paul Whitfield Horn Professor**, Texas Tech University. Horn Professors - named after Paul Whitfield Horn, the first President of the University - are the University Distinguished Professors.
 1997 **Fellow American Physical Society**

MEMBERSHIPS IN PROFESSIONAL SOCIETIES

- Alexander von Humboldt Association of America (lifetime member)
 American Physical Society (fellow)
 Institute of Physics, UK (fellow)
 Materials Research Society
 Sigma Pi Sigma Honor Society

SERVICE

- Chair, International Steering Committee, Int. Conf. on Defects in Semiconductors (ICDS)** (2011 -2015)
Secretary, International Steering Committee, ICDS (2009 -2011)
Member, International Advisory Committee, ICDS (2003 - 2015)
Associate Editor, Journal of Applied Physics

Proc. 32nd Int. Conf. on the Physics of Semiconductors, **Journal of Applied Physics** **117** (2015).

Proc. 26th ICDS, **Journal of Applied Physics** **115** (2014) and AIP Proceedings:

<http://scitation.aip.org/content/aip/proceeding/aipcp/1583>

co-Editor

Proc. 25th ICDS with N.T. Bagraev, V.V. Emtsev, *Physica B* **404** (Elsevier, Amsterdam, 2009)

Proc. 24th ICDS, with M.W. Holtz, C.H. Seager, A.F. Wright, *Physica B* **401-402** (Elsevier, Amsterdam, 2007)

Co-organizer

- Symposium C, *Advanced Materials Research for Electronic and Photovoltaic Applications III* with G. Kissinger, S. Pizzini, H. Yamada-Kaneta, and J. Kang, E-MRS, June 2011, Strasbourg (France)

Focused session *Dopants and Defects in Semiconductors* with J. Ager III and T. Buonassisi, APS meeting March 2011, Dallas (TX)

Symposium C, *Materials, Devices, and Economics Issues for Tomorrow's Photovoltaics* with S. Takashi, K. Vitally, and A. Cavallini, European MRS, September 2010, Warsaw (Poland)

Materials Physics Topical Group session *Hydrogen in Crystalline Semiconductors*, with E.E. Haller APS meeting, March 1991, Cincinnati (OH)

Chair 24th ICDS with Alan Wright (Albuquerque NM, 2007)

Gordon Research Conf. Point & Line Defects in Semiconductors (Colby-Sawyer, 2002)

Vice-chair, *Gordon Research Conf. Point & Line Defects in Semiconductors* (Colby-Sawyer, 2002)

Program Committee

Gordon Research Conference on Defects in Semiconductors (2004 – 2016)

ICDS (2003 – 2017)

Gettering and Defect Engineering in Semiconductor Technology (2011 – 2015)

European MRS (2008-2020)

Editor, *The Science Corner*, popular scientific articles in *Lubbock Magazine* (monthly), 1998-2001

Elected member (1997-2001), Executive Committee, Texas Section, American Physical Society

Member, International Advisory Committee, NATO advanced research workshop, *Early Stages of Oxygen Precipitation in Silicon*, 3/25-28, 1996, Exeter (UK)

Panel Member, *Fundamental Issues in Hydrogen-Defect Interactions*, sponsored by the Council Materials Science, US Department of Energy, 1/8-12, 1990, La Jolla (CA)

PhD EXAMINER

External examiner for Ronald STÜBNER, Technical University Dresden (Dresden, Germany, 2017)

External examiner for Michael STEGER, Simon Fraser University (Vancouver, Canada, 2011)

External examiner for Gianpietro MORAS, King's College London (UK, 2008)

External examiner for James KERMODE, Univ. of Cambridge (UK, 2008)

External examiner for Riccardo RURALI, Autonomous University of Barcelona (Spain, 2003)

Opponent of Juha LENTO, Helsinki Univ. of Technology (Finland, 2003)

INVITED TALKS: PHYSICS CONFERENCES (total: 57)

European Materials Research Society, Symposium I (Strasbourg, France, 6/18, **invited**):

Removing heat from Si with a thermal circuit: an ab-initio study

Workshop on thermal conductivity through layered nanostructures (Loeben, Austria, 11/17, **invited**):

Heat flow and defects in semiconductors and nanostructures

Gordon Research Conference 'Defects in Semiconductors' (New London, NH, 9/16, **plenary**):

Theory and theorists at our GRC

Probing Potential Energy Surfaces PPES IV (Zermatt, Switzerland, 4/16, **invited**):

Phonon-phonon interactions

GADEST 2015 (Bad Staffelstein, Germany, 9/15, **invited**):

Heat flow and defects in Si

International Conference on the Physics of Semiconductors (Austin, TX, 8/14, **invited**):

Heat flow in semiconductor nanostructures containing defects: a first-principles study

EMRS 2014 Spring Meeting (Lille, France, 5/14, **invited**):

Defect dynamics and heat flow in Si and Si nanostructures

27th Int. Conf. on Defects in Semiconductors (Bologna, Italy, 7/13, **plenary**):

Phonon in semiconductors: localized modes, phonon trapping, phonon scattering, and heat flow at heterojunctions

27th Nordic Semiconductor Conference (Helsinki, Finland, 6/13, **invited**):
Phonon trapping in semiconductors

European Materials Research Society, Symposium A (Strasbourg, 5/12, **invited**):
Hydrogen in C-rich Si and the diffusion of vacancy–H complexes

14th DRIP (Defects-Recognition, Imaging & Physics in Semiconductors) (Myazaki, Japan, 9/11, **plenary**):
Theory of defects in semiconductors: phonon trapping and isotope effects

26th International Conference on Defects in Semiconductors (Nelson, New Zealand, 7/11, **tutorial**):
Theory of defects in semiconductors

Psi_k 2010 (Berlin, Germany, 9/10, **invited**): *Preparing supercells for non-equilibrium MD simulations*

Materials Research Society, Symposium I (San Francisco, CA, 3/10, **invited**):
Electrically active and electrically inactive 3d transition metal centers in Si

25th International Conference on Defects in Semiconductors (St Petersburg, Russia, 7/09, **plenary**):
Non-equilibrium dynamics of impurities in semiconductors

European Materials Research Society, Symposium I (Strasbourg, 6/09, **invited**):
Theory of defects in Si and Ge: past, present and challenges

3rd South African Conference on Photonic Materials (Mabula, 3/09, **keynote**):
Fundamental Interactions Involving Transition Metals in Silicon: First-Principles Theory

18th NREL Workshop on c-Silicon Solar Cell Materials and Processes (Vail CO, 8/08, **invited**):
Transition metals, hydrogen and passivation in Si solar cells

European Materials Research Society (Strasbourg, 5/08, **invited**):
Fundamental Interactions Involving Transition Metals in Silicon: First-Principles Theory

Solar Focus Meeting (Ochsenfurt, Germany, 3/08, **plenary**): *Transition Metals in Silicon*

XII GADEST 2007 (Erice, Sicily, 10/07, **invited**): *The fundamental chemistry of iron in Si*

Symposium honoring Professor Sandy DasGupta (Dept. of Chemistry, Texas Tech U., **invited**):
Defects in Semiconductors: a First-Principles Theoretical Approach

16th NREL Workshop on c-Si Solar Cell Materials and Processes (Denver CO, 8/06, **invited**):
Fundamental interactions involving Fe in silicon

International workshop: ‘Hybrid Atomistic Methods for Materials and Biological Systems’ CECAM, (Lyon, France, 7/06, **invited**): *Vibrational Dynamics for Impurities in Semiconductors*

10th International Conference on Muon Spin Rotation (Oxford UK, 8/05, **invited**):
Energetics of H and Mu in Semiconductors: theoretical predictions at finite temperatures

23rd International Conference on Defects in Semiconductors (Awaji Island, Japan, 7/05, **invited**):
Predicting the energetics of defects at $T > 0K$

3rd International Conference on Computational Modeling and Simulation of Materials (Acireale, Sicily, 5/04, **invited**): *Vibrational dynamics of defects in semiconductors*

Fall Meeting of the Texas Section of the American Physics Society, (TX, 10/03, **plenary**):
The forgotten entropies of defects in semiconductors

22nd International Conference on Defects in Semiconductors (Aarhus, Denmark, 7/03, **tutorial**):
Theory of defects in semiconductors

1st Int. Workshop H in Materials & Vacuum Systems (Jefferson Lab, Newport News, VA, 10/02, **invited**):
Dynamics of hydrogen in semiconductors

12th Workshop on c-Si Solar Cell Materials and Processes (Breckenridge, CO, 8/02, **invited**):
Microscopic properties of copper in silicon: theoretical predictions

31st Int. School on the Physics of Semiconductor Compounds (Jaszowiec, Poland, 6/02, **invited**):
Hydrogen molecules in semiconductors: an angel in GaAs, a devil in Si

1st Workshop on defects in Si and SiGe (Manchester, UK, 10/01, **opening talk**): *Dynamics of copper in Si*

9th GADEST (Gettering And Defect Engineering in Semic. Technology) (Catania, Italy, 10/01, **invited**):
Cu-defect and Cu-impurity interactions in Si

21st International Conference on Defects in Semiconductors (Giessen, Germany, 7/01, **plenary**):
The fascinating dynamics of defects in silicon

Gordon Research Conf. ‘Materials Processes Far From Equilibrium’ (Meriden, NH, 7/ 01, **invited**):
Hydrogen-Defect Interactions in Silicon

March Meeting of the American Physical Society (Seattle, 3/01, **invited**):
Molecular-dynamics studies of hydrogen-defect interactions in Si

10th NREL Workshop on c-Silicon Solar Cell Materials and Processes (Copper Mountain, CO, 8/00, **invited**): *Hydrogen, passivation and related issues*

South African Institute of Physics (Annual Meeting, Port Elizabeth, South Africa, 7/99, **invited**):
The Rich Chemistry of Copper in Silicon

Winter School on Defects in Materials (Port Elizabeth, South Africa, 7/99, **invited**):
Ab-Initio Theory of Defects in Silicon

Workshop on Hydrogen Defects in Semiconductors (Exeter, UK, 4/99, **invited**):
Hydrogen Interactions with Intrinsic Defects in Silicon

8th NREL Workshop: c-Si Solar Cell Materials & Processes (Copper Mountain CO, 8/98, **invited**):
Recent Experimental and Theoretical Results for H₂ in Si (with M. Stavola).

European Materials Research Society (Strasbourg, 6/98, **invited**):
Hydrogen and Vacancy-Related Defects in Silicon

19th International Conference on Defects in Semiconductors (Aveiro, Portugal 7/97, **invited**):
Molecular-Dynamics Simulations of Fundamental Defects in Silicon

33rd Workshop Punktdefekte, Max-Planck Institute for Solid State Physics (Stuttgart, 6/97, **invited**):
Vacancy Aggregates in Silicon

6th NREL Workshop on the Role of Impurities and Defects in Silicon Device Processing
(Snowmass CO, 8/96, **invited**): *Passivation Processes in Silicon*

31st Workshop Punktdefekte, Max-Planck Institute for Solid State Physics (Stuttgart, 6/96, **invited**):
Hydrogen-Oxygen Interactions in Silicon

NATO Workshop Early Stages of Oxygen Precipitation in Silicon (Exeter, UK, 3/96, **invited**):
Hydrogen-Oxygen Interactions in Silicon

188th ElectroChemical Society, ‘Wide Bandgap Semiconductors & Devices’ (Chicago, 10/95, **invited**):
Hydrogen in Wide-Bandgap Semiconductors

Gordon Research Conf. ‘Point and Line Defects in Semiconductors’ (Plymouth NH, 7/94, **invited**):
States and Diffusion Properties of Hydrogen: A View from Theory

3rd NREL Workshop: Role of Impurities and Defects in Silicon Device Processing (Vail CO, 8/93, **invited**):
Hydrogen Diffusion and Passivation Mechanisms

6th International Conference on Muon Spin Rotation (Maui HI, 6/93, **invited**):

Hydrogen in Semiconductors: the Roles of μ SR and Theory

American Association for the Advancement of Science, SWARM div. (Albuquerque NM, 5/93, **invited**):
Theoretical Aspects of Hydrogen in Semiconductors

Austin Molecular Design Meeting (Austin TX, 12/92, **invited**):
Density Functional vs. Hartree-Fock: Comparison of Methods Applied to Defects in Semiconductors

2nd NREL Workshop: Role of Impurities & Defects in Si Device Processing (Breckenridge CO, 8/92, **invited**):
Fundamental Properties of Point Defects: the Role of Theory

MRS, Advanced III-V Compound Semiconductor Growth, Processing, and Devices' (Boston, MA 12/91, **invited**):
Theoretical Studies of Defects, Impurities, and Complexes in Compound Semiconductors

INVITED TALKS: SEMINARS AND COLLOQUIA (total: 105)

2020 Walter-Schottky Institute, Garching (Germany), June

2017 University of Texas at Arlington, February
University Autonomos of Barcelona (Spain), May
University of Valladolid (Spain), May
University of Konstanz (Germany), September

2016 University of Milano-Bicocca (Italy), June
University of Munich-Garching (Germany), July
Technical University of Dresden (Germany), July

2015 Zhejiang University (Hangzhou, China), May
University of Bologna (Italy), June
University of Oslo (Norway), July

2014 PChem seminar, department of Chemistry, TTU (January)
University Autonomos of Barcelona (Spain), June
University of Valladolid (Spain), June
University of Muenster (Germany), July
Technical University of Dresden (Germany), July

2013 Ohio University (Athens, OH), October

2012 Lehigh University (Bethlehem, PA), April
King's College London (UK), June
Oxford University (UK), August

2011 Ecole Polytechnique Fédérale (Lausanne, Switzerland), May
Walter-Schottky Institute (Munich, Germany), May
University of Freiburg (Germany), May
Center for investigation in nanoscience and nanotechnology (Barcelona, Spain), June
University of Oviedo (Spain), June
University of Melbourne (Australia), July
Simon Fraser University (Vancouver, Canada), October

2010 Technical University of Dresden (Germany), September
University of Goettingen (Germany), September
University of Aarhus (Denmark), September
University of Aveiro (Portugal), November

- 2009** University of Cambridge (UK), June
- 2008** Ecole Polytechnique Fédérale, Lausanne (Switzerland), May
 University of Dresden (Germany), department of Physics, June
 Rossendorf Forschung Zentrum (Germany), June
 King's College London (UK), July
 MIT - Lab for Photovoltaics Research, August
- 2007** University of Zurich (Switzerland), department of Physics, May
 Walter-Schottky Institute (TU Munich, Germany), May
 Fraunhofer Inst. f. Solar Energy Systems, Freiburg (Germany), June
- 2006** University of Texas at Arlington, department of Physics, May
 University Pierre et Marie Curie, Paris (France), May
 Technical University Dresden (Germany), June
 University of Aarhus (Denmark), June
 King's College London (UK), June
- 2005** University of Exeter (UK), June
 University of Yokohama (Japan), July
 University of Texas at Arlington, department of Chemistry, September
- 2004** University of Rome La Sapienza (Italy), June
 University of Bologna (Italy), June
 University of Milano-Bicocca (Italy), June
 Walter-Schottky Institute (TU Munich, Germany), June
 Max-Planck Institute f. Mikrostrukturphysik – Halle (Germany), June
 Technical University, Dresden (Germany), June
 Technical University of Clausthal (Germany), June
 University of Cambridge (UK), July
- 2003** Sandia Nat. Lab. (Albuquerque, NM), May
 University of Bologna (Italy), June
 Laboratorio MDM - INFN, Milano (Italy), June
 Technical University, Dresden (Germany), June
 Fraunhofer Inst. f. Solar Energy Systems, Freiburg (Germany), July
 The Classical Society, Texas Tech University, September
 University of Montreal (Canada), October
 Ohio University (Athens, OH), October
- 2002** Texas Tech University, Physics Department, January
 Texas Tech University, Department of Electrical Engineering, January
 Lehigh University, Bethlehem, PA, March
 University of California Berkeley, CA, April
 University of Milano – Bicocca, May
 Max-Planck Institute f. Mikrostrukturphysik, June
- 2001** University of Exeter (UK), June
 Joint seminar: King's College and University College, London, June
 University of Aarhus (Denmark), August
 Fritz-Haber Institute, Berlin (Germany), October
 Technical University, Berlin (Germany): lecture on deep levels in semiconductors, October

Max-Planck Institute for microstructure physics, Halle (Germany), November
Walter-Schottky Seminar, Technical University Munich (Germany), November
Centre National de Recherches Scientifiques, PHASE, Strasbourg (France), November
Forschungszentrum Rossendorf (Germany), November
University of Konstanz (Germany), December

- 2000** University of Texas at Arlington, February
University of Zürich (Switzerland), May
Max-Planck Institute for Microstructures, Halle (Germany), May
Technical University, Dresden (Germany), June,
UC Berkeley, (Departmental colloquium and two seminars), October
- 1999** Texas A&M University (College Station), October
University of Witwatersrand (Johannesburg, South Africa), Physics Department, June
University of Pretoria (South Africa), June
SEMATECH (Austin, TX), June
- 1998** University of Exeter (UK), June
King's College (London), June
University Aarhus (Denmark), June
University of Zürich (Switzerland), June
- 1997** MEMC (St. Louis, MO), March
Sandia Nat. Laboratories (Albuquerque, NM), May
Max-Planck Institute für Mikrostruktur, Halle (Germany), June
Physics Department, University of Göttingen, (Germany), June
- 1996** Edinburgh University (Scotland), March
University College (London), Physics Department, March
MEMC-Southwest (Sherman, TX), May
- 1995** Texas Instruments (Dallas TX), May
Max-Planck Institute for Solid State Physics, Stuttgart (Germany), June
University Aarhus (Denmark), September
Swiss Center for Scientific Computing (Manno, Switzerland), October
Fraunhofer Institute - Solar Energy, Freiburg (Germany), October
Centre National de Recherches Scientifiques, Strasbourg (France), October
Walter-Schottky Institute, Technical University München (Germany), November

INVITED TALKS: HISTORY OF WINE (total: 9)

GADEST 2017 (October 1-6, Georgia)

The origin of wine and viticulture

Zhejiang University (Hangzhou, China, May)

An overview of the history of (grape) wine

Osher Lifelong Learning Institute (Texas Tech University, Lubbock, TX, 2/5 and 2/7)

The story of wine (two 90-min lectures)

Texas Section meeting of the APS (Lubbock, TX, 10/12)

The story of wine

XII GADEST 2007 (Erice, Sicily, 10/07)

Wine: From Neolithic Times to the 21st Century

10th International Conference on Muon Spin Rotation (Oxford UK, 8/05)

Wine: the past 7,400 years

31st Electronic Materials Symposium (Santa Clara, CA, 4/03)

Materials in the history of wine

3rd South African Conference on Photonic Materials (Mabula, 3/09)

History of Wine: the past 7,400 years

Materials Research Society, Symposium X (San Francisco, CA, 3/02)

Materials in the history of wine