

Faculty Office:

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Education

Ph. D., Solid State Physics, Purdue University, West Lafayette, IN, May 1984
Thesis: *Experimental Study of Low-Frequency Excess (1/f) Noise in Metal Films*
Advisor: Nicholas J. Giordano
MS, Experimental Physics, Purdue University, West Lafayette, IN, August 1981
BS with Distinction, Physics (Honors) and Applied Mathematics, Purdue University, West Lafayette, IN
May 1980

Employment History

Vanderbilt University:

Professor of Electrical Engineering (1999-present)
Professor of Physics (2000-present), secondary appointment
Chair of Electrical Engineering and Computer Science Department (2003-present)
~ 35 tenured/tenure-track faculty; ~ 15 administrative staff.
~ 200 graduate students; ~ 550 undergraduate students; two large research institutes with > 50
professional research faculty and staff (combined).
EECS research funding increased from ~ \$ 9M per year in 2002-2003 to ~ \$ 24M per year in
2016-2017; publications increased from 103 in 2003 to 278 in 2017.
Associate Dean for Research (½ time), Vanderbilt University School of Engineering, VUSE (2001-2003)
~ 85 tenure/tenure-track faculty.
VUSE research funding increased from ~ \$16.7M in 2001 to ~ \$30 M in 2003; it is now > \$70M.

Previous Employment:

Sandia National Laboratories, Albuquerque, NM, Distinguished/Senior Member of Technical Staff,
Radiation Technology & Assurance Dept. (SMTS 1984 - 1989, DMTS 1990 - July 1999).

Purdue University, Research Assistant (1981-1984), Tutor (1981-1983), Graduate Teaching Assistant
(1980-1981), Undergraduate Teaching Assistant (1978-1980), Physics Department

Research Interests

Effects of ionizing radiation on microelectronic devices & materials - 34 yrs.
Novel microelectronic materials, including silicon-on-insulator materials - 32 yrs.
Charge trapping in silicon dioxide, and Si/SiO₂ interface-trap generation - 34 yrs.
Highly reliable electronics for high-radiation and high-temperature environments - 34 yrs.
Origin(s) of 1/f noise in semiconductors, semiconductor devices, and metals - 39 yrs.
Standard test methods to assess and assure radiation hardness and reliability of electronic devices - 32 yrs.
Defects, reliability, radiation response of SiC, GaN, and other compound semiconductor devices – 17 yrs.
Thermally stimulated current methods to profile defects in insulators - 13 yrs.
Co-invented and assisted in development of novel protonic nonvolatile memory - 6 yrs.

Selected Professional Honors and Awards

Professional Society

2009: Merit Award, this is the pre-eminent lifetime achievement award of the IEEE (Institute of Electrical and Electronics Engineers) Nuclear and Plasma Sciences Society (NPSS)

Fellow, IEEE (M 87, SM 90, Fellow 1997)

Fellow of The American Physical Society, November 2001

Outstanding (O)/Meritorious (M) Student (S: as co-author) Conference Paper Awards (**26**): 2018(O), 2015(S), 2013 (O+S): 2012 (S); 2002 (O+2M); 2001(M); 1998 (O), 1997(O+2M), 1996(O+M), 1995(O+M), 1994(2M), 1993(M), 1988(O), and 1985(O) IEEE Confs. on Nuclear and Space Radiation Effects; 2004 (M), 1995(O), 1990(O) and 1988(O) Conferences on Hardened Electronics and Radiation Technology. 1995 Outstanding Oral Presentation; 2015 GOMAC Outstanding student poster award; 1997 Outstanding Radiation Effects Data Workshop Presentation. Selected out of 80-110 papers, per year, for each conference.

Member, Phi Beta Kappa (National Honorary), Sigma Pi Sigma (National Physics Honorary), Phi Kappa Phi (National Honorary); Member, American Society for Engineering Education, continuous since 2002

Other Professional Awards and Honors

2007: Purdue University, College of Science, Distinguished Alumni Award

2002: Chancellor's Research Award, for achievement in research and scholarship (with Ron Schrimpf, and Sokrates Pantelides). This was presented for work on $1/f$ noise and identification of structures for the O vacancy in SiO₂.

2000: Named one of original Top 250 most highly cited researchers in Engineering (1981-1999) by Inst. for Scientific Information

Discover Magazine (1998), *R&D Magazine* "R&D 100" (1997) and *Industry Week* "Technology of Year" (1997) Awards, for co-invention of protonic nonvolatile field effect transistor memory (patent issued 11/3/1998)

1995-1999: Sandia National Labs Awards for Excellence, and Meritorious Achievement Award

1990: Named Distinguished Member of Technical Staff, Sandia National Laboratories

1984: Lark-Horovitz Award, Purdue University, for excellence in graduate research.

1982-1984: David Ross Graduate Fellow, Purdue Univ; 1980-1982: Purdue Univ Graduate Fellow

HONORARY/VISITING APPOINTMENTS

2014: Honorary Professor, Institute of Microelectronics, Chinese Academy of Sciences, Beijing, China

2013: Guest Professor of Harbin Institute of Technology, Harbin, China

2013: Honorary Professor of Xinjiang Institute of Physics and Chemistry, Chinese Academy of Sciences, Urumqi, China

2011: Honored Professor of the Shanghai Institute for Microsystem and Information Technology, Chinese Academy of Sciences (renewed 2014)

2009: American University of Cairo, Egypt, Distinguished Visiting Professor, October 2009

PUBLICATIONS (536 total – 479 refereed)

415 peer-reviewed journal articles
51 refereed conference proceedings papers and book chapters
49 other conference proceedings papers
13 refereed journal articles in restricted access literature; 8 other publications

Citations: > **18,000** (Google Scholar, May 2018)
h factor: **75** (at least 75 papers cited at least 75 times)
5 > 200; 48 ≥ 100; 332 ≥ 10

PRESENTATIONS (> 500 Total; > 90 Invited Talks and Short Courses)

Summary of Sponsored Research

At Vanderbilt University

Contracts and Grants as PI (total \$3.5 M)

1. “Radiation Effects in Vertical 2D Heterostructure Tunneling Devices Formed Using Large-Area Synthesized Materials,” Feb. 1, 2016 – Jan. 31, 2021, **\$1.12M**, DTRA, Fleetwood, Pantelides, Zhang (40%).
2. “Role of Radiation-induced Defects on the Acceleration of Irradiated GaN HEMT Failure Mechanisms,” Sept. 2013 – Oct. 2016, **\$126k**, NRO, Fleetwood, Schrimpf (50%).
3. “R, D, T, & E of Radiation Effects Phenomena on Electronic Devices Subjected to Aging Environments,” July 2006 – May 2008, **\$1.15M**, US Navy, Fleetwood, Schrimpf, Pantelides (50%)
4. “RDT&E (Research, Development, Test, and Evaluation) of Radiation Effects Phenomena of Hydrogen and Electronics Aging Research,” Jun 2005 – Dec 2005, **\$196k**, Navy/MRC: Fleetwood, Schrimpf, Pantelides. (50 %)
5. “RDT&E of Radiation Effects Phenomena of Hydrogen and Electronics Aging Research,” Apr 2005 – Oct 2005, **\$180k**, Navy/MRC: Fleetwood, Schrimpf, Pantelides. (40 %)
6. “RDT&E of Enhanced Low Dose Rate Sensitivity (ELDRS) Research,” Feb 2004 – Jun 2005, **\$156k**, Defense Threat Reduction Agency: Fleetwood, Schrimpf. (50 %)
7. “Neutron Annealing in GaAs,” Apr 2004 – Mar 2005, **\$50k**, Sandia National Laboratories: Fleetwood. (75 %)
8. “Total Ionizing Dose Research,” Apr 2003 – Apr 2004, **\$45k**, Defense Threat Reduction Agency: Fleetwood, Schrimpf. (50 %)
9. “Low Frequency Noise Measurements,” Jun 2002 – Jun 2003, **\$2.5k**, SiCel Corporation: Fleetwood. (75 %)
10. “Radiation Effects Device Physics for RHTCAD Modeling,” Nov. 1999 – Dec. 2002, **\$478k**, US Navy/MRC: Fleetwood. (75 %)

Contracts and Grants as co-PI (total ~\$35 M)

1. “Physics of Failure and Radiation Effects in Emerging Electronic Materials and Devices in Space Applications,” 2017, **\$1.5 M**, Schrimpf, Fleetwood, Alles, Reed, Pantelides, Zhang (25%).
2. “Air Force (AF) Ground Based Strategic Deterrent (GBSD) Program Support,” 2015, **\$150k**, Schrimpf, Massengill, Alles, Kauppila (10%).
3. “Phase 2.0: Total Ionizing Dose Test Screen of Candidate Devices.” 2015, **\$148k**, Moog, Witulski, Fleetwood, Schrimpf, Reed, Massengill (20%).
4. “Navy SP27 Model Development and Verification Support,” 2014-2015, **\$339k**, US Navy, Schrimpf, Alles, Fleetwood, Massengill (20%).

Dan Fleetwood, CV: May 2018

5. "The Impact of Radiation Damage on Mechanical and Electrical Properties of MEM/NEM Structures," 2015-2018, DTRA, **\$1.75M**, Alles, Schrimpf, Fleetwood, Weller (25%).
6. "Radiation Effects in Two Dimensional Material/High-K Gate Oxides," 2014-2017, **\$655k**, DTRA: Schrimpf, Alles, Reed, Zhang (20%).
7. "Radiation Effects in III-V MOSFETs for sub-10 nm CMOS," 2014-2017, **\$744k**, DTRA: Schrimpf, Alles, Fleetwood, Zhang (25%).
8. "Effects of X-ray based PCB Inspection Systems on Transistor Parameters," Aug. 2013 – July 2014, **\$60k**, Silicon Valley Community Foundation, Bhuvu, Fleetwood, Zhang (20%)
9. "Graphene Memory Device," **\$30k**, July 2012 – March 2013, AFRL/Aneeve, Alles, Fleetwood, Schrimpf (30%).
10. "Rad-Hard Power MOSFET Consulting Activity," Aug. 1, 2012 – Dec. 31, 2012, **\$42k**, Semicoa Corp: Massengill, Witulski, Schrimpf, Fleetwood (20%).
11. "Investigations of Physical Mechanisms for Radiation-Induced Effects in Non-Silicon Channel CMOS Devices," Jan. 1, 2012 – Dec. 31, 2014, **\$1.75M**, DTRA: Reed, Mendenhall, Schrimpf, Weller, Alles, Witulski, Fleetwood, Galloway (10%)
12. "Physical-Mechanisms Based Reliability Analysis for Emerging Technologies," Sept. 2011 – Sept. 2016, **\$1.25M**, AFRL: Schrimpf, Fleetwood, Alles (45%)
13. "D5LE Guidance Replacement Support," Jul. 2011 – Dec. 2011, **\$281k**, Aero Thermo/US Navy: Schrimpf, Fleetwood, Holman, Massengill, Alles (15%).
14. "Minuteman Guidance Replacement Program Radiation Test Philosophy," Jul. 2011 – Sept. 2011, **\$282k**, Department of Defense: Schrimpf, Fleetwood, Holman, Massengill, Weller, Witulski (10%).
15. "Total Dose and Single Event Effects Hardening," Aug. 2011 – Oct. 2011, **\$33k**, Semicoa Corp: Rowe, Fleetwood, Massengill, Schrimpf, Alles (20%).
16. "Radiation Studies in GaN Materials and Devices," Feb. 2011 – Jun. 2016, **\$625k**, DTRA: Schrimpf, Fleetwood (50%).
17. "Radiation Effects in Carbon Based Electronic Materials," March 2010 – Sept 2014, **\$1.2M**, DTRA: Alles, Davidson, Pantelides, Fleetwood (25%)
18. "Rapid-Response Silicon-based Optical Dosimeters for Acute, High Dose Radiation," April 2010 – April 2013, **\$714k**, DTRA: Weiss, Fleetwood, Reed, Weller. (20%)
19. "DURIP: Purchase of High-Speed Test/Probe Equipment for Reliability Studies," April 2010 – June 2011, AFOSR, **\$366k** (equipment grant): Reed, Schrimpf, Fleetwood (30%)
20. "MURI: Design-for-Reliability Initiative for Future Technologies," May 2008 – Dec 2013, **\$1.2M**, ONR: Schrimpf, Fleetwood, Pantelides, Reed. (30%)
21. "Fundamental Studies of the Impact of Complex Material Systems," May 2008 – May 2013, **\$1.25M**, DTRA: Reed, Weller, Mendenhall, Massengill, Fleetwood. (10%)
22. "MURI: Radiation Effects on Emerging Electronic Materials and Devices," May 2005 – Apr 2010, **\$5.5M**, AFOSR: Schrimpf, Fleetwood, Massengill, Weller, Reed, Mendenhall (and VU Physics, GA Tech, Florida, NC State, Rutgers, Arizona St.). (25 % - VU Engineering, ~ 1.5M over 5 years)
23. "ISDE – Institute for Space and Defense Electronics," Jan 2005 – Dec 2007, **\$8M**, Aero Thermal Technology/Navy: Schrimpf, Massengill, Fleetwood, Holman. (10 %)
24. "R, D, T, & E of Rad Effects in Analog and Mixed Signal Technology (Air Force Minuteman)," Jun 2005 – May 2006, **\$445k**: Schrimpf, Massengill, Fleetwood, Weller. (15%)
25. "TCAD Modeling of Particle Radiation Effects in GaN-Based Devices," (2006) **\$94.5k**: Schrimpf, Fleetwood. (40%)
26. "RDT&E of Radiation Effects Phenomena of Hydrogen and Electronics Aging Research," Jun 2004 – May 2005, **\$175k**, Navy/MRC: Schrimpf, Fleetwood, Pantelides. (40 %)
27. "Radiation Effects in Microelectronics," Jun 2000 – Mar 2005, **\$750k**, Defense Threat Reduction Agency: Schrimpf, Fleetwood, Massengill. (33 %)
28. "Radiation Effects Modeling and Simulation," Sep 2003 – May 2005, **\$273k**, BAE Systems: Schrimpf, Massengill, Fleetwood, Holman, Galloway. (10 %)
29. "ISDE – Institute for Space and Defense Electronics," Nov 2004 – Dec 2004, **\$535k**, US Navy/Draper Labs: Schrimpf, Massengill, Fleetwood, Holman. (20 %)
30. "ISDE Radiation Effects Modeling and Simulation of Electronic Parts and Technologies (RHAP)," Jun 2004 – Dec 2004, **\$529k**, CS Draper Labs: Schrimpf, Massengill, Fleetwood, Weller, Robinson, Galloway. (20 %)

Dan Fleetwood, CV: May 2018

31. "ISDE – Institute for Space and Defense Electronics," Oct 2003 – Sep 2004, **\$2.56M**, US Navy/Draper Labs: Schrimpf, Massengill, Fleetwood, Holman, Galloway. (20 %)
32. "A Comprehensive Computational Workbench for Application & Development of Radiation Effects Simulation Codes," Sep 2003 – Sep 2004, **\$50k**, Arnold Engineering Development Center: Weller, Schrimpf, Fleetwood. (25 %)
33. "Transient Radiation Effects Research," Apr 2003 – Apr 2004, **\$91k**, Defense Threat Reduction Agency: Massengill, Schrimpf, Fleetwood, Holman. (5 %)
34. "ISDE – Institute for Space and Defense Electronics," Jan 2003 – Sep 2003, **\$1.2M**, US Navy/Draper Labs: Schrimpf, Massengill, Fleetwood, Holman, Galloway. (25 %)
35. "Enhanced Low Dose Rate Sensitivity in Bipolar Devices," Apr 2002 – Mar 2003, **\$93k**, Defense Threat Reduction Agency: Schrimpf, Fleetwood. (50%)
36. "New Design Technology for Rad-Hard Microelectronics," Jul 2002 – Mar 2004, **\$50k**, Computational Fluid Dynamics Research Corporation: Schrimpf, Fleetwood. (20 %)
37. "Research and Development of Strategic Weapons System Management and Technology Issues in a Declining Industrial Base," Nov 2001 – Oct 2003, **\$199k**, US Navy/MRC: Mahaffey, Schrimpf, Fleetwood. (10 %)
38. "Single Event Transients in an Undervoltage Detector," Sep 2000 – Oct 2001, **\$10k**, Hughes Electronics: Schrimpf, Massengill, Fleetwood. (20 %)
39. "DURIP: Radiation Sources for Total-Dose Testing of Electronics," Apr 2000 – Jul 2001, **\$154k**, AFOSR: Schrimpf, Fleetwood, Massengill. (50%)
40. "DURIP: Precision Semiconductor Parameter Analyzer and Test Fixture," Jan 2000 – Dec 2000, **\$47k**, AFOSR: Schrimpf, Fleetwood, Massengill (25%)

Selected Contracts and Grants as a participant (Total: \$24.5 M)

1. "SSP D5LE Program Support," Jan. 2013 – Dec. 2015, **\$2.2M**, Aero Thermo/US Navy, Schrimpf, Massengill, Fleetwood (10%)
2. "USAF Minuteman AIMU Refresh," Jan. 2013 – Nov. 2014, **\$1.1M**, Aero Thermo/US Air Force, Schrimpf, Massengill, Reed, Weller, Fleetwood (8%)
3. "Design Science For Radiation Effects Rate Prediction and Development," March 2010 – February 2014, **\$450k**, DTRA, Schrimpf, Alles, Reed, Weller, Fleetwood (10%)
4. "ISDE – Institute for Space and Defense Electronics," Jan. 2008 – Dec. 2010, **\$5.0M**, Aero Thermo Technology/Navy: Schrimpf, Massengill. Radiation effects on microelectronics (8 %)
5. "IGERT: The Vanderbilt-Fisk Interdisciplinary Research and Education in the Nanosciences," Oct 2003 – Oct 2008, **\$2.6M**, NSF: Feldman, Cummings, Collins, Rosenthal, Wittig (role: supported writing of proposal draft; faculty participant). (3 %)
6. "Vanderbilt Scientific Computing Center for Multidisciplinary Research," Sep 2003 – Sep 2008, **\$8.3M**, VU Academic Venture Capital Fund (competitively awarded): Moore, Schrimpf, Sheldon (role – faculty participant in center). (2 %)
7. "MURI: Radiation Effects, from Defects to Devices," Jul 1999 – Jun 2004, **\$4.2M**, AFOSR: Schrimpf, Pantelides (VU), Lucovsky (NC State), Brillson (Ohio St.), Weber (UC Berkeley), Neifeld (Arizona). (role – principal collaborator with Schrimpf and Pantelides). (25 %)

Externally Sponsored Research at Sandia National Laboratories (partial list): Total \$5.4 M

<i>Project</i>	<i>Funding Source</i>	<i>Funding Level & Duration</i>	<i>Role</i>	<i>Duration</i>
Advanced Memory Studies	DoD/Intelligence	325k (18 mo)	PI 100%	1998-1999
Protonic Nonvolatile Memory Dvlpmt. (W. Warren, PI)	DARPA/ETO	800k (24 mo)	Co-PI 25%	1997-1999
Enhanced Low-Dose-Rate Bipolar Gain Degradation	Defense Special Weapons Agency (formerly DNA)	900k (60 mo)	PI 60 %	1994-1999
Thermally Stimulated Current in MOS Capacitors	Defense Nuclear Agency (DNA)	500k (36 mo)	PI 75 %	1992-1994

Radiation Effects on Electronics & Sensors (P Winokur, PI)	Ballistic Missile Defense Org.	1.4M (24 mo)	Co-PI	1991-1993
Improved MOS Radiation Test Methods (P Winokur, PI)	DNA	750k (48 mo)	Co-PI	1988-1992
Memory Retention Studies	DoD/Intelligence	300k (24 mo)	PI	1990-1992
Transistor Degradation Modeling	DoD/Intelligence	200k (24 mo)	PI	1986-1988
Evaluation of 10-keV X-ray Source (P Winokur, PI)	DNA	200k (24 mo)	Co-PI	1986-1988
			33 %	
			50 %	
			60 %	
			50 %	
			50 %	

Summary of Courses Taught at Vanderbilt University

1. EECE 233 – Electromagnetics (3 hrs). 11 times: Fall 1999 through Fall 2008. Core EE junior electricity and magnetism course. Vectors and operators, Electrostatics, Magnetism, Maxwell’s Eqns. & Plane Wave Solutions, Transmission Lines.

Year	Instructor rating (5 max)	Course rating (5 max)
1999	4.26	3.97
2000	3.84	3.52
2001	4.55	4.05
2002	4.09	3.61
2003	4.31	3.77
2004	4.47	4.13
2005	4.43	4.14
2006	4.34	3.91
2007	3.95	3.27
2008	4.25	3.79
2011	4.00	3.66
2016	4.00	3.55

2. ES 101 – Moore’s Law and the Microelectronics Industry (1 hr). 13 times. Fall 2000 through the present. Freshman seminar on Moore’s Law, the Microelectronics Economy, and the Stock Market. *New course developed at Vanderbilt.*

Year	Instructor rating (5 max)	Course rating (5 max)
2000	4.23	3.92
2001	4.86	4.57
2002	4.52	4.24
2003	4.75	4.50
2004	4.37	4.05
2005	4.56	4.19
2006	4.11	4.00
2007	4.50	4.50
2008	4.53	4.30
2009	4.36	4.18
2010	4.57	4.35
2011	4.37	4.12
2012	4.38	4.20

2013	3.91	3.91
2014	4.07	3.69
2015	4.45	4.15
2016	4.48	4.27
2017	4.65	4.45

3. EECE 304 – Radiation Effects and Reliability (3 hrs). Graduate course, 6 times. Total Ionizing Dose Effects, Single Event Effects, Displacement Damage, Microelectronics Reliability. *New course developed at Vanderbilt.*

Year	Instructor rating (5 max)	Course rating (5 max)
2000	4.69	4.46
2002	4.60	4.50
2004	4.13	4.13
2006	4.25	4.18
2008	4.25	4.06
2009	4.25	4.08
2012	4.55	4.11
2013	4.75	4.25
2015	4.92	4.57
2017	4.80	4.80

Note: School means are typically ~ 4.1 out of 5.0.

Summary of Graduate Students Advised

PhD Graduates (10 as primary advisor; 2 as co-advisor)

Rong Jiang completed her PhD (Electrical Engineering) in January 2018. Her dissertation title is “Bias Dependence of Radiation Response and Reliability of AlGa_N/Ga_N High Electron Mobility Transistors.” ~13 publications. Rong was supported by AFOSR through the Hi-REV program and by the Defense Threat Reduction Agency’s basic research program through her PhD studies. Rong is joining Intel Corporation, Hillsboro, OR, as a reliability engineer.

Guoxing Duan completed his PhD (Electrical Engineering) in August 2016. His dissertation title is “Radiation effects, negative bias-temperature instability, and low-frequency 1/f noise in SiGe/SiO₂/HfO₂ pMOS Devices.” ~8 publications. MS 2014. Guoxing was supported by AFOSR through the Hi-REV program during his PhD studies. Guoxing is now a reliability engineer with Intel Corp in Folsom, CA.

Jin Chen completed her PhD (Electrical Engineering) in August 2016. Her dissertation title is “Radiation Response and Reliability of High Speed AlGa_N/Ga_N HEMTs.” ~15 Publications. MS 2013. Jin was supported by the Defense Threat Reduction Agency’s basic research program during her PhD studies. Jin received the 2014 IEEE NSREC Paul Phelps Award (one of three), the 2015 IEEE NPSS Graduate Student Award (one of four), and the 2015 IEEE NSREC Outstanding Student Conference Paper Award. Jin is now a reliability engineer with Micron Technology in Boise, Idaho.

Cher Xuan Zhang completed her PhD (Electrical Engineering) in April 2013. Her dissertation title is “Reliability and Irradiation Effects of 4H-SiC MOS Devices.” > 20 publications: MS 2011. Cher’s work was supported by the Air Force Office of Scientific Research and the Defense Threat Reduction Agency.

Cher received the 2012 IEEE NSREC Paul Phelps Award (one of three) and the 2012 IEEE NPSS Graduate Student Award (one of four). Cher is now an engineer with Intel Corp. in Folsom, CA.

Sarah Ashley Francis completed her PhD (Electrical Engineering) in October 2011. Her dissertation title was “Aging and irradiation response of $1/f$ noise in metal oxide semiconductor devices.” ~10 publications; MS 2008. Ashley’s work was funded by the US Navy and AFOSR. She is currently an engineering in the Autani wireless controls division of Enterprise Electric, in Nashville, TN.

Tania Roy completed her PhD (Electrical Engineering) in October 2011. Her dissertation title was “Reliability limiting defects in GaN/AlGaIn high electron mobility transistors.” ~9 publications. Tania’s work was funded by the Office of Naval Research through the DRIFT MURI program. Tania was a postdoctoral research associate at the Georgia Institute of Technology and at UC-Berkeley, and is now an assistant professor with the EECS Department and Nanoscience Technology Center at the University of Central Florida.

Aritra Dasgupta completed his PhD (Electrical Engineering) in August 2011. His dissertation title was “Radiation response in MOS devices with high-K gate oxides and metal gates.” Aritra’s work was funded by the Defense Threat Reduction Agency’s basic research program. ~8 publications; MS 2009. He is working at Global Foundries (Hopewell Junction, NY) in advanced semiconductor technology development.

Xing J. Zhou completed her PhD (Interdisciplinary Graduate Program in Materials Science) in December 2006. Her dissertation title was “Charge trapping properties of alternative high-K dielectrics in MOS devices.” Xing was funded by the US Navy and AFOSR. Xing has authored or co-authored more than 15 journal articles, which have been cited more than 200 times to date, and received the 2006 IEEE NSREC Paul Phelps Award (one of two) and the 2006 IEEE NPSS Graduate Student Award (one of four). Xing has worked at IBM (Hopewell Junction, NY) and at Samsung in Austin, TX.

Hao Xiong completed his PhD (EE) in December 2004. His dissertation title was “Charge trapping and low frequency noise in MOSFETs.” Supported by Defense Threat Reduction Agency, AFOSR MURI, and US Navy/Aging program. 10 publications. MS 2003 (spent one year in Materials Science program). Winner of IEEE NPSS Paul Phelps Award and Graduate Student Award, 2004. Hao worked a post-doctoral researcher at the National Institute of Standards and Technology, Bethesda, MD. He completed the MBA program at Yale University, and is now with the Venture Capital Arm of TCL Corporation in Shenzhen, China.

James A. Felix completed his PhD (EE) in December 2003. His dissertation title was “The radiation response and long term reliability of high-K gate dielectrics.” Supported by NSF Risk and Reliability IGERT, and the US Navy. 12 publications. MS 2001. Winner of IEEE NPSS Paul Phelps Award, 2001, and Graduate Student Award, 2002. Jim is now a Distinguished Member of the Technical Staff at Sandia National Laboratories, Albuquerque, NM.

Indranil Chatterjee (PhD co-advisee; principal advisor Bharat Bhuvu, EE) completed his PhD (EE) in August 2014. His dissertation was entitled “Geometric Dependence of The Total Ionizing Dose Response of FinFETs.” Indranil’s work was supported by TSMC and the Naval Research Laboratory. He was a post-doctoral research associate at University of Bristol, UK, and is now working for Airbus Industries.

Sriram K. Dixit (PhD co-advisee; principal advisor Len Feldman, Physics) completed his PhD (Interdisciplinary Graduate Program in Materials Science) in May 2008. His dissertation was entitled “Radiation-Induced charge trapping studies of advanced Si and SiC based MOS devices.” Sriram joined Intel Corporation as a reliability and product engineer in June 2008.

Other MS Advisees

Simeng (Ellen) Zhao, MSEE, August 2017: “Capacitance-frequency Estimates of Border-trap Densities in Multi-fin MOS Capacitors.” Ellen was supported during her MS study by AFOSR through the Hi-REV program and by the Defense Threat Reduction Agency’s basic research program. She is continuing her PhD studies at Vanderbilt.

Pan Wang, MSEE, March 2017: “Gate voltage dependence of low frequency noise of AlGaN/GaN HEMTs.” Pan was supported during her MS study by AFOSR through the Hi-REV program and by the Defense Threat Reduction Agency’s basic research program. She is continuing her PhD studies at Vanderbilt.

Ioana Danciu, MSEE, December 2011: “ $1/f$ noise and aging effects on MOS transistors.” Ioana was supported by the previous employer, the VU Medical Center, during her MS studies. She is now employed with the Institute for Software Integrated Systems at Vanderbilt University.

Rajan Arora, MSEE, May 2009: “Reliability issues in Ge and SiC MOS devices,” co-advised with Ron Schrimpf. Work supported by AFOSR MURI. Rajan completed his PhD at Georgia Tech and is now working with Texas Instruments in Dallas, TX.

Dakai Chen (co-advised with Ron Schrimpf) Thesis title: “Total dose irradiation effects on Si and Ge MOS capacitors with alternative gate dielectrics.” Funded by AFOSR MURI. MS in EE in December 2007. Dakai works for NASA Goddard Spaceflight Center in Greenbelt, MD.

Martin Rodgers (co-advised with Ron Schrimpf), MS, May 2006. His thesis was entitled, “The effects of aging on MOS irradiation and annealing response.” Martin was supported by the US Navy DTO/Aging program and the AFOSR MURI; he now works with Albany Nanotech, New York.

Xinwen Hu, MS, May 2003: “Mechanisms of proton-induced degradation in AlGaAs/GaAs heterojunction bipolar transistors.” Funded by AFOSR/MURI. Working at Spang Corporation.

Quping Hu, MS, Dec. 2000: “ $1/f$ noise measurements for bulk and SOI MOS devices.” Funded by US Navy/MRC. Left to work at Altera Corporation.

PhD Committees

Chundong Liang, EE, 2017; Kai Ni, EE, 2016; Tu Hong, EE, 2016; Shubhajit Mukherjee, IGPMS, 2015; Girija Gaur, EE, 2015; Schweta Bhandaru, IGPMS, 2015; Yunhao Cao, EE, 2013; Judson Ryckman, EE, 2013; Yang Jiao, EE, 2013; Farah El-Mamouni, EE, 2012; David Hughart, EE, 2012; Nadia Rezzak, EE, 2012; Sandeepan DasGupta, EE, 2010; Jon Gosnell, IGPMS, 2010; Aditya Kalavagunta, EE, 2009; Christina Howe, EE, 2008; Jonny Pellish, EE, 2008; Jingbo Qi, Physics, 2008; Jeffrey Black, EE, 2008; Aditya Karmarkar, IGPMS, 2005 (co-advisor); Abdulrahman Al-Badri, EE, 2005; Sarit Dhar, IGPMS, 2005; Chris Nicklaw, EE, 2003; Tamas Bakos, Physics, 2003; Xiaowei (Vivian) Zhu, EE, 2002; Zsuzsanna Marka, Physics, 2002; Hugh Barnaby, EE, 2002.

Other MS Committees

Pengfei Wang, EE, 2017; Michael McCurdy, EE, 2017; Vishwa Ramachandran (co-advisor, with R. D. Schrimpf), EE, 2006; Ryan Cizmarik, EE, 2004; John Hutson, EE, 2004; John Stacey, EE, 2004; Ajay Raparla, EE, 2001; Yanfeng Li, EE, 2000

Post-doctoral researchers advised

Enxia Zhang, 2008-2010 (now research assistant professor at Vanderbilt)
Xing Zhou, 2006-2008 (now at Samsung, Austin, TX)
Antoine Touboul (co-advisor, with R. D. Schrimpf), 2006 (faculty member at Univ. Montpellier, France)
Bongim Jun, 2002-2004 (now with Boeing Corporation, Spectrolab, Sylmar, CA)

ummary of Service

National Service

2007: Chair, APS Pake Prize Committee

2004: Served on Navy SSP Blue Ribbon Panel to review design and progress of Trident Missile/D5LE (D5 Life Extension) at the request of US Navy.

2003: Served on Enhanced Ground Testing panel for Trident Missile/D5LE (D5 Life Extension) at the request of US Navy.

Professional/Society Service

2017, Co-Chair, International Workshop on Reliability of Micro- and Nano-Electronic Devices in Harsh Environment, Chengdu, China, May 22-24, 2017.

2016-2017, Ultra-wide band-gap grand challenge external advisory board, Sandia National Laboratories

2013-Present, Senior Editor, Radiation Effects, *IEEE Transactions on Nuclear Science*

2013-Present, Distinguished Lecturers Chair, IEEE Nuclear and Plasma Sciences Society (NPSS)

2013: Conference publication chair: RADECS 2013, Oxford, UK, Sept. 23-27, 2013

2012-Present, Vice-Chair, Publications, IEEE Nuclear and Space Radiation Effects Conference, Radiation Effects Steering Group

2012-2015, Past Chairman, IEEE Nuclear and Space Radiation Effects Conference, Radiation Effects Steering Group (3 year term)

2009-2012: Chairman, IEEE Nuclear and Space Radiation Effects Conference, Radiation Effects Steering Group (3 year term)

2009: Session Chair, RADECS Conference, Bruges, Belgium, and ISDRS, College Park, MD

2006: Executive Vice-Chair, IEEE Nuclear and Space Radiation Effects Conference, Radiation Effects Steering Group (3 year term)

2006: IEEE NPSS AdCom (4 year term)

2006-2018: Member, Board of Directors, Southeastern Center for Electrical Engineering Education

2005-2006: Chair (2005), Forum on Industrial and Applied Physics (FIAP), The American Physical Society: Chaired FIAP Nomination committee. Past-chair (2006) – served on APS Pake Prize Committee, and served as acting chair of FIAP Fellowship Committee.

2006-2010: ABET Program Evaluator

Served as computer engineering visitor, Fall 2006, 2009, and 2010

EE visitor, Fall 2007 and Fall 2008

Developed and implemented assessment for ABET and SACS for VU EECS.

2005: Co-chair, SPIE International Symposium on Noise in Devices and Circuits III (FN 104), Fluctuations and Noise 2005, Austin TX, May 23-26.

2004: General Chair, IEEE Nuclear and Space Radiation Effects Conference, Atlanta, GA. 575 Attendees.

Dan Fleetwood, CV: May 2018

2004: Chair-Elect, Forum on Industrial and Applied Physics (FIAP), The American Physical Society: Chaired FIAP Fellows committee.

2003: Vice-Chair, Forum on Industrial and Applied Physics (FIAP), The American Physical Society: Responsible for planning the FIAP portion of the March 2004 American Physical Society Meeting, Montreal, Quebec. This involved 10 invited symposium with 4-5 invited talks each, and 20 focus sessions, with 6-13 talks each.

Co-organizer, SPIE International Symposium 5112 on Noise as a Tool for Studying Materials; Fluctuations and Noise 2003, Santa Fe, NM, June 1-4, 2003.

2001-2003: IEEE National Fellows Committee – evaluates Fellow Nominations and makes recommendations to IEEE Board of Directors for candidates recommendation for Fellow Grade.

Co-organizer of Symposia on Defects in Electronic Materials and Defects for the March 2002 American Physical Society meeting, through the Forum on Industrial and Applied Physics.

Vice-chair, Publications, IEEE Nuclear and Space Radiation Effects Conference (NSREC) Steering Committee (1994-1997); Short Course Chair (1999 - Norfolk) & Instructor (1995 - Madison), Technical Prog. Chair (1994 - Tucson), Poster Chair (1991 – San Diego), Steering Group Nominating Comm. (1991 & 94), Awards Comm. (87,88,99,00); Session Chair (1993 and 2001), IEEE NSREC

Tech. Prog. Committee/Session Chair, 1994-96 IEEE Semiconductor Interface Specialists Conference (SISC); Arrangements Chair (1997 – Charleston, SC), Technical Chair (1998 – San Diego, CA), and General Chair (1999 – Charleston, SC) IEEE SISC

Co-chair, Workshop on The Si-SiO₂ and the SiC-SiO₂ Interfaces - Similarities and Differences , Albuquerque, NM (1999);

Short Course Instructor, 1996 Taiwanese Space Program Office (Hsinchu, Taiwan), and 1991 IEEE Nuclear Science Symposium (Santa Fe, NM)

Guest Editor, April 1996 Special Issue on Single Event Effects and the Space Radiation Environment, and December 1988-90 issues of *IEEE Transactions on Nuclear Science*.

1996-Present, Editorial Advisory Board, *Microelectronics Reliability*

Co-chair, Workshop on Radiation and Process Induced Defects in MIS Systems, Research Triangle Park, NC (1991)

Technical Program Committee and Session Chair, 1988-9 Conferences on Space Nuclear Power Systems, Albuquerque, NM

Service internal to Vanderbilt

2003-Present: Chairman, EECS Department

2016, Member, SACS Quality Enhancement Plan Committee

2014, Chancellor's strategic planning sub-committee for Educational Technologies

2012-2015: Stevenson Chair search committee, VU Physics.

2006-2009: University Promotion and Tenure Committee

2003-2005: Chaired University Task Force on Classified Research. Coordinated campus wide town hall meeting, Nov. 30. Proposed revision to University Faculty Manual, III, Ch. 5 – adopted, 2005.

2002-2005: Executive Committee – Vanderbilt Institute for Nanoscale Science and Engineering; Put together Nanotechnology Database for the Vanderbilt University School of Engineering in 2001, which was instrumental in achieving funding for this initiative, awarded through the VU Academic Venture Capital Fund.

2002-2005: University Senate – Business and Nonacademic Affairs Committee – Spring 2003; Academic Policies and Services Committee – Fall 2003-Spring 2005; Nominating Committee, 2004.

1999-2005: Vanderbilt Undergraduate Summer Research Program VUSE representative.

2004: Search Committee – information technology security officer.

2002-2003: University Undergraduate Research Committee

2002-2003: Senior School Leaders Information Technology Committee

Dan Fleetwood, CV: May 2018

2000-2004: VU Community Giving Allocations Committee.
2002-2004: Served on the Flowers Chair Search Committee.
2001-2002: Chair, VUSE Consultative Committee on Promotion and Tenure
2001-2002: VU International Affairs Committee
2001-2002: Chair, VUSE Engineering Research Council
2000-2002: EECS ABET Fulfillment Committee
2000-2003: Executive Committee – Interdisciplinary Graduate Program in Materials Science
1999-2002: Academic Advisor to EE undergraduate class of 2002
1999-2001: EECS Representative to Graduate Faculty Delegate Assembly

Selected Service as a student at Purdue

1978-1980: President, Society of Physics Students, Purdue University
1977-1979: Vice-President, Purdue Chess Club

Selected Community and Additional Service

2005-2007: Industrial Advisory Board, ECE Dept., University of Alabama at Huntsville
2003: Lecture on correspondence chess at the Nashville Chess Center, June
2003: Presented keynote speech at the National Honor Society induction ceremony, September, Brentwood, TN.

Selected Personal Awards and Honors

2011: Received a “Yuri Gagarin First Spaceflight 50th Anniversary” medal from the Cosmonautics Federation of Russia for contributions to promoting international cooperation related to space electronics.

International Correspondence Chess GrandMaster title (2008) – one of ~12 US correspondence chess GMs.

2004: 29th person added to Seymour High School (IN) Wall of Fame, in recognition for career and personal achievements.

International Correspondence Chess Master (1997)/Senior IM (2000); Finished 8th in 18th World Correspondence Chess Championship; best score and grandmaster norm on Board 3 of the 14th International Correspondence Chess Olympiad Final; achieved second GM norm and title while playing first board for USA in 15th International Correspondence Chess Olympiad Final.

2005: Winner, Limerick contest, IEEE Semiconductor Interface Specialists Conference

1994: Winner, Limerick contest, IEEE Semiconductor Interface Specialists Conference

1993: Winner, United States Chess Federation Absolute Correspondence Chess Championship

1982: Honorable mention, Lyric-9 Songwriters Competition for pop and country music divisions

1981: 1st place individual, ACUI Regional Collegiate Chess Championship

1976: National Merit Scholar; Valedictorian – Seymour High School (IN)

1976: National Scholar Athlete Award

1976: All-South Central Conference (SCC) Baseball Team (left-handed pitcher) – pitched perfect no-hitter in SCC tournament, striking out 17 batters of 21 faced (school record performances)

1975: 1st trombone, All-State sight-reading band, Indiana; gold medalist, State solo competition

1975: National Council of Teachers of English Composition Award

PATENTS: Dan Fleetwood

1. W. L. Warren (SNL), K. J. R. Vanheusden (Univ. of New Mexico), J. R. Schwank, **D. M. Fleetwood**, M. R. Shaneyfelt, P. S. Winokur (SNL), and R. A. B. Devine, “Screening Method for Selecting Semiconductor Substrates Having Defects Below a Predetermined Level in an Oxide Layer,” US Patent No. 5,786,231, issued July 28, 1998.
2. W. L. Warren (SNL), K. J. R. Vanheusden (UNM), R. A. B. Devine (France Telecom), and **D. M. Fleetwood** (SNL), “Memory Device Using Movement of Protons,” US Patent No. 5,830,575, issued Nov. 3, 1998. European Patent No. 97942460.3-2108 filed 9/17/97.
3. W. L. Warren (SNL), K. J. R. Vanheusden (UNM), **D. M. Fleetwood** (SNL), and R. A. B. Devine (France Telecom), “Memory Device Using Movement of Protons,” US Patent No. 6,140,157, issued Oct. 31, 2000.
4. W. L. Warren (SNL), K. J. R. Vanheusden (UNM), **D. M. Fleetwood** (SNL), R. A. B. Devine (France Telecom/CNET), L. B. Archer, G. A. Brown, and R. M. Wallace (Texas Instruments), “Memory Device Using Movement of Protons,” US Patent No. 6,159,829, issued Dec. 12, 2000.

BOOKS AND SPECIAL ISSUES EDITED

1. D. M. Fleetwood, D. B. Brown, S. Girard, P. Gouker, S. Gerardin, H. Quinn, and H. Barnaby, *Modeling and Simulation of Radiation Effects*, Special Issue: *IEEE Trans. Nucl. Sci.*, pp. 1439-1706, Aug. 2015.
2. D. M. Fleetwood, S. T. Pantelides, and R. D. Schrimpf, *Defects in Microelectronic Materials and Devices* (CRC Press, Boca Raton, FL, 2008), 753 pages.
3. A. A. Balandin, F. Danneville, M. J. Deen, and D. M. Fleetwood, *Noise in Devices and Circuits III*, Vol. 5844, SPIE, The Society for Optical Engineering (SPIE, Bellingham, 2005), 312 pp.

4. R. D. Schrimpf and D. M. Fleetwood, *Radiation Effects and Soft Errors in Integrated Circuits and Electronic Devices* (World Scientific, Singapore, 2004), 350 pp.
5. D. M. Fleetwood and R. Gaillard, *Single Event Effects and the Space Radiation Environment*, Special Issue: April 1996, *IEEE Trans. Nucl. Sci.*, pp. 341-704 (1996).

PUBLICATION LIST: Dan Fleetwood

Peer reviewed journal articles

1. L. Zhao, D. Yan, Z. Zhang, B. Hua, G. Yang, Y. Cao, E. X. Zhang, X. Gu, and D. M. Fleetwood, "Temperature-dependent efficiency droop in GaN-based blue LEDs," *IEEE Electron Device Lett.*, vol. 39, no. 4, pp. 528-531, Apr. 2018.
2. J. Yang, X. J. Li, C. M. Liu, and D. M. Fleetwood, "The effect of ionization and displacement damage on minority carrier lifetime," *Microelectron. Reliab.*, vol. 80, no. 3, pp. 124-129, Mar. 2018.
3. D. M. Fleetwood, "Border traps and bias-temperature instabilities in MOS devices," *Microelectron. Reliab.*, vol. 80, no. 1, pp. 266-277, Jan. 2018.
4. F. Faccio, G. Borghello, E. Lerario, D. M. Fleetwood, R. D. Schrimpf, H. Gong, E. X. Zhang, P. Wang, S. Michelis, S. Gerardin, A. Paccagnella, and S. Bonaldo, "Influence of LDD spacers and H⁺ transport on the total-ionizing-dose response of 65 nm MOSFETs irradiated to ultrahigh doses," *IEEE Trans. Nucl. Sci.* vol. 65, no. 1, pp. 164-174, Jan. 2018. (**Outstanding Conference Paper**)
5. P. Wang, C. Perini, A. O. Hara, B. R. Tuttle, E. X. Zhang, H. Gong, L. Dong, C. Liang, R. Jiang, W. Liao, D. M. Fleetwood, R. D. Schrimpf, E. M. Vogel, and S. T. Pantelides, "Radiation-induced charge trapping and low-frequency noise of graphene transistors," *IEEE Trans. Nucl. Sci.* vol. 65, no. 1, pp. 156-163, Jan. 2018.
6. R. Jiang, E. X. Zhang, S. E. Zhao, D. M. Fleetwood, R. D. Schrimpf, R. A. Reed, M. L. Alles, J. C. Shank, M. B. Tellekamp, and W. A. Doolittle, "Total-ionizing-dose response of Nb₂O₅-based MIM diodes for neuromorphic computing applications," *IEEE Trans. Nucl. Sci.* vol. 65, no. 1, pp. 78-83, Jan. 2018.
7. S. E. Zhao, R. Jiang, E. X. Zhang, W. Liao, C. Liang, D. M. Fleetwood, R. D. Schrimpf, R. A. Reed, D. Linten, J. Mitard, N. Collaert, S. Sioncke, and N. Waldron, "Capacitance-frequency estimates of border-trap densities in multi-fin MOS capacitors," *IEEE Trans. Nucl. Sci.* vol. 65, no. 1, pp. 175-183, Jan. 2018.
8. M. A. Bhuiyan, H. Zhou, S. J. Chang, X. Lou, X. Gong, R. Jiang, H. Gong, E. X. Zhang, C. H. Won, J. W. Lim, J. H. Lee, R. G. Gordon, R. A. Reed, D. M. Fleetwood, P. Ye, and T.-P. Ma, "Total-ionizing-dose responses of GaN-based HEMTs with different channel thicknesses and MOSHEMTs with epitaxial MgCaO as gate dielectric," *IEEE Trans. Nucl. Sci.* vol. 65, no. 1, pp. 46-52, Jan. 2018.
9. P. Wang, A. L. Sternberg, J. A. Kozub, E. X. Zhang, N. A. Dodds, S. L. Jordan, D. M. Fleetwood, R. A. Reed, and R. D. Schrimpf, "Analysis of TPA pulsed-laser-induced single-event latchup sensitive area," *IEEE Trans. Nucl. Sci.* vol. 65, no. 1, pp. 502-509, Jan. 2018.
10. H. Gong, K. Ni, E. X. Zhang, A. L. Sternberg, J. A. Kozub, K. L. Ryder, R. F. Keller, L. D. Ryder, S. M. Weiss, R. A. Weller, M. L. Alles, R. A. Reed, D. M. Fleetwood, R. D. Schrimpf, A. Vardy, and J. A. del Alamo, "Scaling effects on single-event transients in InGaAs FinFETs," *IEEE Trans. Nucl. Sci.* vol. 65, no. 1, pp. 296-303, Jan. 2018.
11. N.-Q. Deng, W. J. Liao, J. Hu, P. Wang, M. X. Xu, H. N. Zhang, P. Wang, C. D. Liang, H. Tian, X. P. Ouyang, Y. Yang, T.-L. Ren, E. X. Zhang, and D. M. Fleetwood, "Total-ionizing-dose effects on a graphene x-ray detector laser-scribed from graphene oxide," *IEEE Trans. Nucl. Sci.* vol. 65, no. 1, pp. 473-477, Jan. 2018.
12. C. N. Arutt, W. Liao, H. Gong, P. D. Shurva, J.-T. Lin, M. L. Alles, B. W. Alphenaar, J. L. Davidson, K. M. Walsh, S. McNamara, E. X. Zhang, A. L. Sternberg, D. M. Fleetwood, R. A. Reed, and R. D. Schrimpf, "Dose-rate effects on the total-ionizing-dose response of piezoresistive micromachined cantilevers," *IEEE Trans. Nucl. Sci.* vol. 65, no. 1, pp. 58-63, Jan. 2018.
13. H. Gong, W. Liao, E. X. Zhang, A. L. Sternberg, M. W. McCurdy, J. L. Davidson, R. A. Reed, D. M. Fleetwood, R. D. Schrimpf, P. D. Shuvra, J.-T. Lin, S. McNamara, K. M. Walsh, B. W. Alphenaar, and M. L. Alles, "Proton-induced displacement-damage and total-ionizing-dose effects on silicon-based MEMS resonators," *IEEE Trans. Nucl. Sci.* vol. 65, no. 1, pp. 34-38, Jan. 2018.
14. A. M. Tonigan, C. N. Arutt, E. J. Parma, P. J. Griffin, D. M. Fleetwood, and R. D. Schrimpf, "Correlation of a bipolar-transistor-based neutron displacement damage sensor methodology with proton irradiations," *IEEE Trans. Nucl. Sci.* vol. 65, no. 1, pp. 495-501, Jan. 2018.

15. G. Liu, E. X. Zhang, C. D. Liang, M. A. Bloodgood, T. T. Salguero, D. M. Fleetwood, and A. A. Balandin, "Total-ionizing-dose effects on threshold switching in 1T-TaS₂ charge density wave devices," *IEEE Electron Device Lett.*, vol. 38, no. 12, pp. 1724-1727, Dec. 2017.
16. L. Xu, J. X. Luo, J. Chen, Z. Chai, W. W. He, E. X. Zhang, and D. M. Fleetwood, "Improved single-event transient hardness in tunnel-diode body-contact SOI nMOS transistors," *IEEE Trans. Nucl. Sci.*, vol. 64, no. 10, pp. 2669-2672, Oct. 2017.
17. Y. S. Puzyrev, X. Shen, C. X. Zhang, J. Hachtel, K. Ni, B. K. Choi, E. X. Zhang, O. Ovchinnikov, R. D. Schrimpf, D. M. Fleetwood, and S. T. Pantelides, "Memristive devices from ZnO nanowire bundles and meshes," *Appl. Phys. Lett.* vol. 111, article no. 153504, Oct. 2017.
18. R. Chen, F. Q. Zhang, W. Chen, L. Ding, X. Q. Quo, C. Shen, Y. H. Luo, W. Zhao, L. Zheng, H. Guo, Y. Liu, and D. M. Fleetwood, "Single-event multiple transients in conventional and guard-ring hardened inverter chains under pulsed laser and heavy-ion irradiation," *IEEE Trans. Nucl. Sci.*, vol. 64, no. 9, pp. 2511-2518, Sep. 2017.
19. K. Ni, A. L. Sternberg, E. X. Zhang, J. A. Kozub, R. D. Schrimpf, R. A. Reed, D. M. Fleetwood, M. L. Alles, D. McMorro, J. Lin, A. Vardi, and J. A. del Alamo, "Understanding charge collection mechanisms in InGaAs FinFETs using high-speed pulsed-laser transient testing with tunable wavelength," *IEEE Trans. Nucl. Sci.*, vol. 64, no. 8, pp. 2069-2078, Aug. 2017.
20. R. M. Chen, N. N. Mahatme, Z. J. Diggins, L. Wang, E. X. Zhang, Y. P. Chen, Y. N. Liu, B. Narasimham, A. F. Witulski, B. L. Bhuvu, and D. M. Fleetwood, "Impact of temporal masking of flip-flop upsets on soft error rates of sequential circuits," *IEEE Trans. Nucl. Sci.*, vol. 64, no. 8, pp. 2098-2106, Aug. 2017.
21. R. M. Chen, Z. J. Diggins, N. N. Mahatme, L. Wang, E. X. Zhang, Y. P. Chen, H. Zhang, Y. N. Liu, B. Narasimham, A. F. Witulski, B. L. Bhuvu, and D. M. Fleetwood, "Effects of temperature and supply voltage on SEU- and SET-induced errors in bulk 40-nm sequential circuits," *IEEE Trans. Nucl. Sci.*, vol. 64, no. 8, pp. 2122-2128, Aug. 2017.
22. X. J. Li, J. Yang, H. J. Barnaby, K. F. Galloway, R. D. Schrimpf, D. M. Fleetwood, and C. M. Liu, "Dependence of ideality factor in lateral PNP transistors on surface carrier concentration," *IEEE Trans. Nucl. Sci.*, vol. 64, no. 6, pp. 1549-1553, Jun. 2017.
23. E. X. Zhang, D. M. Fleetwood, J. A. Hachtel, C. Liang, R. A. Reed, M. L. Alles, R. D. Schrimpf, D. Linten, J. Mitard, M. F. Chisholm, and S.T. Pantelides, "Total ionizing dose effects on strained Ge pMOS FinFETs on bulk Si," *IEEE Trans. Nucl. Sci.*, vol. 64, no. 1, pp. 226-232, Jan. 2017.
24. P. Wang, R. Jiang, J. Chen, E. X. Zhang, M. W. McCurdy, R. D. Schrimpf, and D. M. Fleetwood, "1/f noise in as-processed and proton-irradiated GaN/AlGaIn HEMTs due to carrier-number fluctuations," *IEEE Trans. Nucl. Sci.*, vol. 64, no. 1, pp. 181-189, Jan. 2017.
25. R. Jiang, E. X. Zhang, M. W. McCurdy, J. Chen, X. Shen, P. Wang, D. M. Fleetwood, R. D. Schrimpf, S. W. Kaun, E. C. H. Kyle, J. S. Speck, and S. T. Pantelides, "Worst-case bias for proton and 10-keV X-ray irradiation of AlGaIn/GaN HEMTs," *IEEE Trans. Nucl. Sci.*, vol. 64, no. 1, pp. 218-225, Jan. 2017.
26. K. Ni, E. X. Zhang, R. D. Schrimpf, D. M. Fleetwood, R. A. Reed, M. L. Alles, J. Lin, and J. A. del Alamo, "Gate bias and geometry dependence of total-ionizing-dose effects in InGaAs quantum-well MOSFETs," *IEEE Trans. Nucl. Sci.*, vol. 64, no. 1, pp. 239-244, Jan. 2017.
27. C. Liang, Y. Su, E. X. Zhang, K. Ni, M. L. Alles, R. D. Schrimpf, D. M. Fleetwood, and S. Koester, "Total ionizing dose effects on HfO₂-passivated black phosphorus transistors," *IEEE Trans. Nucl. Sci.*, vol. 64, no. 1, pp. 170-175, Jan. 2017.
28. T. D. Loveless, S. Jagannathan, E. X. Zhang, D. M. Fleetwood, J. S. Kauppila, T. D. Haeffner, and L. W. Massengill, "Combined effects of total ionizing dose and temperature on a K-band quadrature LC-tank VCO in a 32 nm CMOS SOI technology," *IEEE Trans. Nucl. Sci.*, vol. 64, no. 1, pp. 204-211, Jan. 2017.
29. X. Wan, O. K. Baker, M. W. McCurdy, E. X. Zhang, M. Zafrani, S. P. Wainwright, J. Xu, H. L. Bo, R. A. Reed, D. M. Fleetwood, and T. P. Ma, "Low energy proton irradiation effects on commercial enhancement mode GaN HEMTs," *IEEE Trans. Nucl. Sci.*, vol. 64, no. 1, pp. 253-257, Jan. 2017.
30. W. Liao, E. X. Zhang, M. L. Alles, C. X. Zhang, H. Gong, K. Ni, A. L. Sternberg, H. K. Xie, D. M. Fleetwood, R. A. Reed, and R. D. Schrimpf, "Total-ionizing-dose effects on piezoelectric micromachined ultrasonic transducers," *IEEE Trans. Nucl. Sci.*, vol. 64, no. 1, pp. 233-238, Jan. 2017.
31. H. Gong, W. Liao, E. X. Zhang, A. L. Sternberg, M. W. McCurdy, J. L. Davidson, R. A. Reed, D. M. Fleetwood, R. D. Schrimpf, P. D. Shuvra, J. T. Lin, S. McNamara, K. M. Walsh, B. W. Alphenaar, and M. L. Alles, "Total-ionizing-dose effects in piezoresistive micromachined cantilevers," *IEEE Trans. Nucl. Sci.*, vol. 64, no. 1, pp. 263-268, Jan. 2017.
32. B. D. Sierawski, K. M. Warren, A. L. Sternberg, R. A. Austin, J. M. Trippe, M. W. McCurdy, R. A. Reed, R. A. Weller, M. L. Alles, R. D. Schrimpf, L. W. Massengill, D. M. Fleetwood, A. Monteiro, G. Buxton, J. C.

- Brandenburg, W. B. Fisher, and R. Davis, "CubeSats and crowd-sourced monitoring for single event effects hardness assurance," *IEEE Trans. Nucl. Sci.*, vol. 64, no. 1, pp. 293-300, Jan. 2017.
33. R. M. Chen, Z. J. Diggins, N. N. Mahatme, L. Wang, E. X. Zhang, Y. P. Chen, Y. N. Liu, B. Narasimham, A. F. Witulski, B. L. Bhuvu, and D. M. Fleetwood, "Effects of total-ionizing-dose irradiation on SEU- and SET-induced soft errors in bulk 40-nm sequential circuits," *IEEE Trans. Nucl. Sci.*, vol. 64, no. 1, pp. 471-476, Jan. 2017.
34. S. Ren, M. A. Bhuiyan, H. Wu, R. Jiang, K. Ni, E. X. Zhang, R. A. Reed, D. M. Fleetwood, P. Ye, and T.-P. Ma, "Total ionizing dose (TID) effects in ultra-thin body Ge on insulator (GOI) junction-less CMOSFETs with recessed source/drain and channel," *IEEE Trans. Nucl. Sci.*, vol. 64, no. 1, pp. 176-180, Jan. 2017.
35. S. Ren, M. A. Bhuiyan, J. Zhang, X. Lou, M. Si, X. Gong, R. Jiang, K. Ni, X. Wan, E. X. Zhang, R. G. Gordon, R. A. Reed, D. M. Fleetwood, P. Ye, and T.-P. Ma, "Total ionizing dose (TID) effects in GaAs MOSFETs with La based epitaxial gate dielectrics," *IEEE Trans. Nucl. Sci.*, vol. 64, no. 1, pp. 164-169, Jan. 2017.
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2. D. M. Fleetwood, "Forum: North of the border," *The Industrial Physicist* **9**, No. 6, 26-27 (2003).
3. R. A. Anderson, C. H. Seager, B. L. Draper, M. R. Shaneyfelt, H. D. Stewart, A. G. Sault, G. V. Herrera, and D. M. Fleetwood, "Investigation of protonated-oxide memory structures," SAND2001-0139, available through NTIS (January 2001).
4. J. R. Schwank, K. Vanheusden, M. R. Shaneyfelt, B. L. Draper, D. M. Fleetwood, W. L. Warren, T. L. Meisenheimer, J. R. Murray, and P. M. Smith, "A novel non-destructive silicon-on-insulator nonvolatile memory," SAND 99-2797, available through NTIS, (Nov. 1999).
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6. D. M. Fleetwood, "Border traps in MOS devices," *IEEE Trans. Nucl. Sci.* **39**, No. 2, 269-71 (1992). [**Guest Editorial**]
7. T. J. Garino, C. A. Reber, and D. M. Fleetwood, "Ceramic coatings on package lids for radiation protection," SAND91-0301, UC-704, available through NTIS (August 1991).
8. D. M. Fleetwood, "Experimental study of low-frequency excess ($1/f$) noise in metal films," Ph. D. Thesis (Purdue University, 1984, Advisor = N. Giordano).

PRESENTATIONS: DAN FLEETWOOD

Invited Talks and Short Courses

1. D. M. Fleetwood, "Evolution of total ionizing dose effects in MOS devices with Moore's Law scaling," *European Conference on Radiation Effects on Components and Systems (RADECS)*, Geneva, Switzerland, Oct. 2, 2017. (short course)
2. D. M. Fleetwood, J. Chen, R. Jiang, E. X. Zhang, S. Mukherjee, R. D. Schrimpf, Y. S. Puzyrev, and S. T. Pantelides, "Radiation response, $1/f$ noise, and reliability of GaN/AlGaIn HEMTs," *2017 International Workshop on Reliability of Micro- and Nano-Electronics in Harsh Environment*, Chengdu, China, May 22-24, 2017. (keynote address)

3. R. A. Reed, R. A. Weller, J. M. Trippe, S. L. Weeden-Wright, E. D. Funkhouser, C. N. Arutt, R. D. Schrimpf, B. D. Sierawski, K. M. Warren, L. W. Massengill, D. M. Fleetwood, M. L. Alles, E. X. Zhang, and M. Asai, "Applications of MRED (Monte Carlo Radiative Energy Deposition)," 12th GEANT4 Space Users Workshop, Guildford, UK, April 10-12, 2017.
4. D. M. Fleetwood, "Moore's Law and radiation effects," Microelectronics Quality and Reliability Workshop, El Segundo, CA, Feb. 7-9, 2017. (keynote address)
5. D. M. Fleetwood, P. Wang, J. Chen, R. Jiang, E. X. Zhang, M. W. McCurdy, and R. D. Schrimpf, "1/f noise in AlGaIn/GaN HEMTs," IEEE International Conference on Solid-State and Integrated Circuit Technology, Hangzhou, China, Oct. 25-28, 2016.
6. E. Simoen, G. Eneman, A. Vinicius De Oliveira, K. Ni, J. Mitard, L. Witters, P. Ghedini Der Agopian, J. A. Martino, D. M. Fleetwood, R. D. Schrimpf, R. A. Reed, N. Collaert, A. Thean, and C. Claeys, "On the assessment of electrically active defects in high-mobility materials and devices," IEEE International Conference on Solid-State and Integrated Circuit Technology, Hangzhou, China, Oct. 25-28, 2016.
7. D. M. Fleetwood, J. Chen, R. Jiang, E. X. Zhang, and R. D. Schrimpf, "Hardness assurance issues for GaN/AlGaIn HEMTs," Microelectronics Quality and Reliability Workshop, El Segundo, CA, Feb. 9-10, 2016.
8. S. M. Weiss, S. Bhandaru, S. Hu, and D. M. Fleetwood, "Radiation studies on silicon photonic ring resonators," SPIE Optics & Photonics, San Diego, CA, Aug. 28 – Sept. 1, 2015.
9. S. T. Pantelides, R. D. Schrimpf, and D. M. Fleetwood, "Connecting theory to experiments – Defects in semiconductor electronic devices," 28th International Conference on Defects in Semiconductors, Espoo, Finland, July 27 – 31, 2015. (plenary)
10. D. M. Fleetwood, "Energies and microstructures of defects contributing to 1/f noise in microelectronic materials and devices," 23rd International Conference on Noise and Fluctuations, Xi'an, China, June 2-6, 2015. (plenary)
11. D. M. Fleetwood and R. A. Reed, "Radiation effects in microelectronics," imec, Leuven, Belgium, May 12-13, 2015.
12. R. D. Schrimpf, D. M. Fleetwood, S. T. Pantelides, Y. S. Puzyrev, S. Mukherjee, R. A. Reed, J. S. Speck, and U. K. Mishra, "Physical mechanisms affecting the reliability of GaN-based high electron mobility transistors," Reliability and Materials Issues of Semiconductors-Optical and Electron Devices and Materials III, Spring Materials Research Society Meeting, San Francisco, CA, April 6-10, 2015 (Invited).
13. S. A. Ringel, A. R. Arehart, Z. Zhang, A. Sasikumar, D. Cardwell, E. C. H. Kyle, S. Kaun, J. Chen, E. X. Zhang, P. Saunier, C. Lee, D. M. Fleetwood, R. D. Schrimpf, and J. S. Speck, "Toward an understanding of GaN defects and device reliability using deep level trap spectroscopy methods," Reliability and Materials Issues of Semiconductors-Optical and Electron Devices and Materials III, Spring Materials Research Society Meeting, San Francisco, CA, April 6-10, 2015 (Invited).
14. J. S. Speck, E. C. H. Kyle, S. Kaun, Z. Zhang, A. R. Arehart, J. Chen, E. X. Zhang, D. M. Fleetwood, R. D. Schrimpf, and S. A. Ringel, "GaN reliability," Reliability and Materials Issues of Semiconductors-Optical and Electron Devices and Materials III, Spring Materials Research Society Meeting, San Francisco, CA, April 6-10, 2015 (Invited).
15. R. D. Schrimpf, M. L. Alles, R. A. Reed, D. M. Fleetwood, S. Weeden-Wright, K. Ni, I. Samsel, and E. X. Zhang, "Single-event effects in emerging device technologies," Microelectronics Quality and Reliability Workshop, El Segundo, CA, Jan. 27-29, 2015.
16. D. M. Fleetwood, E. X. Zhang, G. X. Duan, C. X. Zhang, I. K. Samsel, N. C. Hooten, W. G. Bennett, R. D. Schrimpf, R. A. Reed, D. Linten, and J. Mitard, "Soft errors and NBTI in SiGe pMOS transistors," IEEE International Conference on Solid-State and Integrated Circuit Technology, Guilin, China, Oct. 28-31, 2014.
17. S. T. Pantelides, R. D. Schrimpf, and D. M. Fleetwood, "Defect-mediated degradation of III-V HEMTs – From atomic-scale physics to engineering-level modeling," Workshop on Defects in Wide Band Gap Semiconductors, College Park, MD, Sept. 23, 2014.
18. D. M. Fleetwood, "Fundamentals of radiation effects in the space environment," First Workshop on Radiation Effects, in Guangzhou, China, Aug. 9, 2014.
19. D. M. Fleetwood, J. Chen, E. X. Zhang, Y. S. Puzyrev, R. D. Schrimpf, and S. T. Pantelides, "Defects affecting the 1/f noise and reliability of GaN/AlGaIn HEMTs," 10th International Conference on Reliability, Maintainability and Safety, Guangzhou, China, Aug. 6-8, 2014.
20. S. A. Ringel, A. Arehart, A. Sasikumar, Z. Zhang, J. Speck, E. C. H. Kyle, M. Fireman, S. Kaun, R. D. Schrimpf, D. M. Fleetwood, "Defects in GaN-based transistors," Conference 8986: Gallium Nitride Materials and Devices IX, SPIE Photonics West, San Francisco, CA, Feb. 1-6, 2014.

21. R. D. Schrimpf, M. L. Alles, D. M. Fleetwood, K. M. Warren, R. A. Reed, and R. A. Weller, "Radiation effects and reliability: Physical mechanisms and rate prediction," IEEE International Integrated Reliability Workshop, Fallen Leaf Lake, CA, Oct. 13-17, 2013.
22. D. M. Fleetwood and E. X. Zhang, "Charge pumping in floating-body SOI FinFETs," 20th International Symposium on the Physical and Failure Analysis of Integrated Circuits, Suzhou, China, July 15-19, 2013.
23. D. M. Fleetwood, "Radiation response and reliability of MOS Devices," Tutorial: 20th International Symposium on the Physical and Failure Analysis of Integrated Circuits, Suzhou, China, July 16, 2013.
24. D. M. Fleetwood, T. Roy, X. Shen, Y. S. Puzyrev, E. X. Zhang, R. D. Schrimpf, and S. T. Pantelides, "Oxygen-related border traps in MOS and GaN devices," IEEE International Conference on Solid-State and Integrated Circuit Technology, Xi'an, China, Oct. 29 – Nov. 1, 2012.
25. R. D. Schrimpf, M. L. Alles, F. El-Mamouni, D. M. Fleetwood, R. A. Weller, and R. A. Reed, "Soft Errors in Advanced CMOS Technologies," IEEE International Conference on Solid-State and Integrated Circuit Technology, Xi'an, China, Oct. 29 – Nov. 1, 2012.
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44. S. T. Pantelides, Z-Y. Lu, C. Nicklaw, T. Bakos, S. N. Rashkeev, D. M. Fleetwood, R. D. Schrimpf, K. van Benthem, and S. J. Pennycook, "The E' center and oxygen vacancies in SiO₂," The XI Conference on the Physics of Non-Crystalline Solids, Rhodes, Greece, Oct. 29 – Nov. 2, 2006.
45. S. T. Pantelides, R. D. Schrimpf, D. M. Fleetwood, L. Tsetseris, S. N. Rashkeev, and X. J. Zhou, "Atomic scale mechanisms for radiation-induced phenomena in MOSFETs," RADECS 2006, Athens, Greece, Sept. 27-29, 2006.
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47. S. T. Pantelides, L. Tsetseris, S. N. Rashkeev, X. J. Zhou, D. M. Fleetwood, and R. D. Schrimpf, "Hydrogen in MOSFETs: The Good, the Bad, and the Ugly," International Workshop on Modeling of Reliability Issues, Vienna, Austria, May 25-27, 2006.
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51. S. T. Pantelides, M. H. Evans, D. M. Fleetwood, E. P. Gusev, J. D. Joannopoulos, Z. Lu, S. J. Pennycook, S. N. Rashkeev, R. D. Schrimpf, L. Tsetseris, K. Van Benthem, X-G. Zheng, and X. J. Zhou, "Defect-related issues in high-K dielectrics," NATO Advanced Research Workshop on Defects in High-K Dielectrics and Nano-Electronic Semiconductor Devices, St. Petersburg, Russia, July 11-14, 2005.
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53. D. M. Fleetwood, X. J. Zhou, L. Tsetseris, S. T. Pantelides, and R. D. Schrimpf, "Hydrogen model for negative-bias temperature instabilities in MOS gate insulators," 8th International Symposium on Silicon Nitride and Silicon Dioxide Thin Insulating Films and Other Emerging Dielectrics, 207th Meeting of the Electrochemical Society, Quebec City, QC, Canada, May 15-20, 2005.
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 - (a) 2nd International Conf. on Microelectronics, Microstructures, and Nanotechnology, Athens, Greece, Nov. 2004.
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 58. R. D. Schrimpf, R. A. Weller, D. M. Fleetwood, and S. T. Pantelides, "Physically-Based Radiation-Effects Models: Application to Design Hardening," European Workshop on Radiation Hardened Electronics, Grenoble, France, March 30 – April 1, 2004.
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 65. R. D. Schrimpf, D. M. Fleetwood, and S. T. Pantelides, "A Multidisciplinary Approach to Modeling and Testing Microelectronic Materials and Devices," National Space & Missile Materials Symposium, Colorado Springs, CO, June 24-26, 2002.
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- 174.M. Li, Y. A. Li, R. D. Schrimpf, D. M. Fleetwood, N. Rezzak, J. Wang, D. Wang, X. Chen, and Y. Wang, "A new physical model and parameter extraction approach for total-ionizing-dose-aware SPICE models."
- 175.R. Arora, K. A. Moen, J. D. Cressler, E. X. Zhang, D. M. Fleetwood, R. D. Schrimpf, A. K. Sutton, H. M. Nayfeh, and G. Freeman, "Layout-induced trade-offs between RF performance and total-dose tolerance in 45 nm RF-CMOS."
- 176.E. X. Zhang, A. K. M. Newaz, S. Bhandaru, B. Wang, C. X. Zhang, D. M. Fleetwood, M. L. Alles, R. D. Schrimpf, S. T. Pantelides, S. M. Weiss, R. A. Reed, R. A. Weller, and K. I. Bolotin, "Low-energy x-ray- and ozone-exposure induced defect formation in graphene materials and devices."
- 177.J. J. Song, C. H. Park, Y. H. Jeong, O. Kim, B. K. Choi, E. X. Zhang, R. D. Schrimpf, and D. M. Fleetwood, "Fin width and bias dependence of the response of triple-gate MOSFETs to total-dose irradiation."

Denver, CO, July 19-23, 2010

- 178.E. X. Zhang, D. M. Fleetwood, F. El Mamouni, R. D. Schrimpf, M. L. Alles, W. Xiong, K. Akarvardar, and S. Cristoloveanu, "Total ionizing dose effects on FinFET-based capacitor-less 1T-DRAMs."
- 179.A. Dasgupta, D. M. Fleetwood, R. A. Reed, R. A. Weller, M. H. Mendenhall, and B. D. Sierawski, "Dose enhancement and reduction in high-K MOS insulators."
- 180.C. X. Zhang, E. X. Zhang, D. M. Fleetwood, R. D. Schrimpf, K. F. Galloway, E. Simoen, J. Mitard, and C. Claeys, "Effects of processing and radiation bias on leakage currents in Ge pMOSFETs."
- 181.B. R. Tuttle, D. R. Hughart, R. D. Schrimpf, D. M. Fleetwood, and S. T. Pantelides, "Defect interactions of H₂ in SiO₂: Implications for ELDRS and latent interface trap buildup."
- 182.T. Roy, E. X. Zhang, Y. S. Puzyrev, D. M. Fleetwood, R. D. Schrimpf, B. K. Choi, A. B. Hmelo, and S. T. Pantelides, "Process dependence of proton-induced degradation in HEMTs."
- 183.N. Rezzak, R. D. Schrimpf, M. L. Alles, E. X. Zhang, D. M. Fleetwood, and Y. F. Li, "Layout-related stress effects on radiation-induced leakage current."
- 184.F. El Mamouni, M. Bawedin, E. X. Zhang, R. D. Schrimpf, D. M. Fleetwood, and S. Cristoloveanu, "Total dose effects on the performance of irradiated capacitor-less MSDRAM cells."
- 185.Y. F. Li, N. Rezzak, E. X. Zhang, R. D. Schrimpf, D. M. Fleetwood, J. Wang, D. Wang, Y. Wu, and S. Cai, "Including the effects of process-related variability on radiation response in advanced foundry process design kits."

Quebec City, Canada, July 20-24, 2009

- 186.R. Arora, J. Rozen, D. M. Fleetwood, K. F. Galloway, X. C. Zhang, J. Han, S. Dimitrijevic, F. Kong, L. C. Feldman, S. T. Pantelides, and R. D. Schrimpf, "Charge trapping properties of 3C- and 4H-SiC MOS capacitors with nitrided gate oxides."
- 187.D. R. Hughart, R. D. Schrimpf, D. M. Fleetwood, X. J. Chen, H. J. Barnaby, K. E. Holbert, R. L. Pease, D. G. Platteter, B. R. Tuttle, and S. T. Pantelides, "The effects of aging and hydrogen on the radiation response of gated lateral PNP bipolar transistors."
- 188.F. El Mamouni, E. X. Zhang, R. D. Schrimpf, D. M. Fleetwood, R. A. Reed, S. Cristoloveanu, and W. Xiong, "Fin-width dependence of ionizing radiation-induced degradation in 100-nm gate length finFETs."
- 189.M. J. Beck, Y. S. Puzyrev, N. Sergueev, K. Varga, R. D. Schrimpf, D. M. Fleetwood, and S. T. Pantelides, "The role of atomic displacements in ion-induced dielectric breakdown." *Best Paper Nominee.*
- 190.M. Silvestri, S. Gerardin, F. Faccio, R. D. Schrimpf, D. M. Fleetwood, and A. Paccagnella, "The role of irradiation bias on the time dependent dielectric breakdown of 130-nm MOSFETs exposed to x-rays." *Best Paper Nominee.*
- 191.A. Kalavagunta, M. Silvestri, M. J. Beck, S. K. Dixit, R. D. Schrimpf, R. A. Reed, D. M. Fleetwood, L. Shen, and U. K. Mishra, "Impact of proton irradiation-induced bulk defects on gate-lag in GaN HEMTs."

Tucson, AZ, July 14-18, 2008

- 192.D. M. Fleetwood, R. D. Schrimpf, S. T. Pantelides, R. L. Pease, and G. W. Dunham, "Electron capture, hydrogen release, and ELDRS in linear bipolar transistors."
- 193.X. J. Zhou, D. M. Fleetwood, R. D. Schrimpf, F. Faccio, and L. Gonella, "Radiation effects on the 1/f noise of field oxide field effect transistors."

- 194.M. J. Beck, R. D. Schrimpf, D. M. Fleetwood, and S. T. Pantelides, "Displacement damage effects in single-event gate rupture." *Best Paper Nominee*.
- 195.H. Park, S. K. Dixit, R. D. Schrimpf, D. M. Fleetwood, and S. E. Thompson, "Total ionizing dose effects on strained HfO₂-based MOSFETs."
- 196.I. G. Batyrev, R. Durand, D. Hughart, M. Bounasser, D. M. Fleetwood, R. D. Schrimpf, B. Tuttle, G. W. Dunham, and S. T. Pantelides, "Effects of hydrogen soaking on the radiation response of bipolar transistors: experiments and modeling."
- 197.X. J. Chen, H. J. Barnaby, K. Holbert, R. L. Pease, D. M. Fleetwood, R. D. Schrimpf, S. T. Pantelides, and P. C. Adell, "Annealing behavior of oxide trapped charge in bipolar base oxides after radiation exposure in H₂ environments."
- 198.J. D. Black, D. R. Ball, K. M. Warren, R. D. Schrimpf, R. A. Reed, D. M. Fleetwood, W. H. Robinson, A. D. Tipton, D. A. Black, P. E. Dodd, and N. F. Haddad, "Characterizing SRAM single event upset in terms of single and double node charge collection."
- 199.J. R. Schwank, M. R. Shaneyfelt, J. A. Felix, P. E. Dodd, A. Dasgupta, S. A. Francis, X. J. Zhou, D. M. Fleetwood, R. D. Schrimpf, S. T. Pantelides, and G. K. Lum, "Effects of moisture exposure on radiation-induced MOS device degradation and its implications for long-term aging." *Best Paper Nominee*.

Honolulu, HI, July 23-27, 2007

- 200.K. Adarvardar, R. D. Schrimpf, D. M. Fleetwood, S. Cristoloveanu, P. Gentil, and B. Blalock, "Evidence of radiation-induced dopant neutralization in partially-depleted SOI MOSFETs."
- 201.D. K. Chen, R. D. Schrimpf, D. M. Fleetwood, K. F. Galloway, S. Lee, H. Seo, G. Lucovsky, B. Jun, and J. D. Cressler, "Total dose response of HfSiON MOS capacitors."
- 202.S. K. Dixit, X. J. Zhou, R. D. Schrimpf, D. M. Fleetwood, S. T. Pantelides, L. C. Feldman, G. Bersuker, and R. Choi, "Radiation induced charge trapping in ultra-thin HfO₂ based MOSFETs."
- 203.M. J. Beck, R. Hatcher, R. D. Schrimpf, D. M. Fleetwood, and S. T. Pantelides, "Quantum mechanical description of displacement damage formation." *Best Paper Nominee*.
- 204.M. Caussanel, A. Canals, S. K. Dixit, M. J. Beck, R. D. Schrimpf, D. M. Fleetwood, S. T. Pantelides, and A. D. Touboul, "Doping-type dependence of damage in Si diodes exposed to x-ray, proton, and He⁺ irradiation."
- 205.F. Faccio, L. Gonella, H. J. Barnaby, M. McLain, D. M. Fleetwood, and R. D. Schrimpf, "Total ionizing dose effects in shallow trench isolation oxides."
- 206.A. Madan, B. Jun, R. M. Diestelhorst, A. Appaswamy, J. D. Cressler, R. D. Schrimpf, D. M. Fleetwood, T. Isaacs-Smith, J. R. Williams, and S. J. Koester, "Radiation tolerance of Si/SiGe n-MOSFETs."
- 207.P. Cheng, B. Jun, A. Sutton, C. Zhu, A. Appaswamy, J. D. Cressler, R. D. Schrimpf, and D. M. Fleetwood, "Probing radiation and hot-carrier-induced damage processes in SiGe HBTs using mixed-mode electrical stress."
- 208.M. Bellini, B. Jun, A. K. Sutton, A. C. Appaswamy, P. Cheng, J. D. Cressler, P. W. Marshall, R. D. Schrimpf, D. M. Fleetwood, B. El-Kareh, S. Balster, P. Steinmann, and H. Yasuda, "The effects of proton and x-ray irradiation on the DC and AC performance of complementary (nnp + pnp) SiGe HBTs on thick-film SOI."
- 209.R. M. Diestelhorst, S. Finn, B. Jun, A. K. Sutton, P. Cheng, J. D. Cressler, P. W. Marshall, R. D. Schrimpf, D. M. Fleetwood, H. Gustat, B. Heinemann, G. G. Fisher, D. Knoll, and B. Tillack, "The effects of x-ray and proton irradiation on a 200 GHz/90 GHz complementary (nnp + pnp) SiGe:C HBT technology."
- 210.B. Jun, A. K. Sutton, R. M. Diestelhorst, G. J. Duperon, J. D. Cressler, J. D. Black, T. Haeffner, R. A. Reed, M. L. Alles, R. D. Schrimpf, D. M. Fleetwood, and P. W. Marshall, "The application of RHBD to n-MOSFETs intended for use in cryogenic-temperature radiation environments."

Ponte Vedra Beach, FL, July 17-21, 2006

- 211.X. J. Zhou, D. M. Fleetwood, L. Tsetseris, R. D. Schrimpf, and S. T. Pantelides, "Effects of switched-bias annealing on charge trapping in HfO₂ gate dielectrics."
- 212.I. G. Batyrev, M. P. Rodgers, D. M. Fleetwood, R. D. Schrimpf, and S. T. Pantelides, "Effects of water on the aging and radiation response of MOS devices."
- 213.X. J. Chen, H. J. Barnaby, R. D. Schrimpf, D. M. Fleetwood, R. L. Pease, and D. G. Platteter, "Nature of interface defect buildup in gated bipolar devices under low dose rate irradiation."
- 214.M. J. Beck, L. Tsetseris, M. Caussanel, R. D. Schrimpf, D. M. Fleetwood and S. T. Pantelides, "Atomic-scale mechanism for dopant-type dependent damage in Si at low NIEL." *Best Paper Nominee*.

- 215.V. Ramachandran, B. Narasimham, R. D. Schrimpf, W. T. Holman, D. M. Fleetwood, A. F. Witulski, R. L. Pease, G. Dunham, J. Seiler, and D. G. Platteter, "Modeling total-dose effects of a low-dropout voltage regulator."
- 216.S. K. Dixit, S. Dhar, J. Rozen, S. Wang, R. D. Schrimpf, D. M. Fleetwood, S. T. Pantelides, and L. C. Feldman, "Total dose radiation response of nitrided and non-nitrided SiO₂/4H-SiC MOS Capacitors."
- 217.G. Lucovsky, S. Lee, H. Seo, L. B. Fleming, M. Ulrich, D. E. Aspnes, R. D. Schrimpf, D. M. Fleetwood, J. A. Felix, and J. Luning, "Differences between charge trapping states in irradiated nano-crystalline HfO₂ and non-crystalline Hf silicates."
- 218.M. Bellini, B. Jun, T. Chen, J. D. Cressler, P. W. Marshall, D. Chen, R. D. Schrimpf, D. M. Fleetwood, and J. Cai, "Radiation and bias effects in fully-depleted and partially-depleted SiGe HBTs fabricated on CMOS-compatible SOI."
- 219.B. Jun, R. M. Diestelhorst, M. Bellini, G. Espinel, A. P. Gnana Prakash, J. D. Cressler, D. Chen, R. D. Schrimpf, and D. M. Fleetwood, "Temperature-dependence of gate-induced drain leakage in X-ray irradiated 130 nm CMOS devices."
- 220.A. K. Sutton, A. P. Gnana Prakash, B. Jun, E. Zao, R. M. Diestelhorst, G. Espinel, J. D. Cressler, M. A. Carts, A. M. Phan, P. W. Marshall, R. L. Ladbury, C. J. Marshall, R. A. Reed, R. D. Schrimpf, and D. M. Fleetwood, "An investigation of dose enhancement and source dependent effects in 200 GHz SiGe HBTs."

Seattle, WA, July 11-15, 2005

- 221.X. J. Zhou, D. M. Fleetwood, J. A. Felix, E. P. Gusev, and C. D'Emic, "NBTI and radiation effects in high-K alternative dielectrics." *Best Paper Nominee*.
- 222.A. P. Karmarkar, D. M. Fleetwood, R. D. Schrimpf, R. A. Weller, B. D. White, L. J. Brillson, and U. K. Mishra, "Proton-induced damage in GaN-based Schottky diodes."
- 223.M. P. Rodgers, D. M. Fleetwood, and R. D. Schrimpf, "The effects of aging on MOS irradiation and annealing response."
- 224.L. Tsetseris, R. D. Schrimpf, D. M. Fleetwood, R. L. Pease, and S. T. Pantelides, "Common origin for enhanced low-dose-rate sensitivity and bias temperature instability under negative bias."

Atlanta, GA, July 19-23, 2004

- 225.S. N. Rashkeev, D. M. Fleetwood, R. D. Schrimpf, and S. T. Pantelides, "Effects of hydrogen motion on interface trap formation and annealing."
- 226.R. A. Weller, M. H. Mendenhall, and D. M. Fleetwood, "A screened Coulomb scattering module for displacement damage computations in Geant4."
- 227.H. D. Xiong, B. Jun, D. M. Fleetwood, R. D. Schrimpf, and J. R. Schwank, "Charge trapping and low frequency noise in SOI buried oxides."
- 228.J. Stacey, R. D. Schrimpf, D. M. Fleetwood, and K. Holmes, "Surface charge analysis as a total dose radiation measurement tool for Si/SiO₂."
- 229.A. P. Karmarkar, B. Jun, D. M. Fleetwood, R. D. Schrimpf, R. A. Weller, B. D. White, L. J. Brillson, and U. K. Mishra, "Proton irradiation effects on GaN-based high electron mobility transistors with Si-doped Al_xGa_{1-x}N and thick GaN cap layers."
- 230.J. A. Felix, M. R. Shaneyfelt, J. R. Schwank, P. E. Dodd, D. M. Fleetwood, E. P. Gusev, "The effects of processing on radiation-induced charge buildup and annealing in devices with high-K gate dielectrics."
- 231.M. R. Shaneyfelt, J. R. Schwank, J. A. Felix, P. E. Dodd, D. M. Fleetwood, R. L. Pease, and M. C. Maher, "Annealing behavior of linear bipolar devices with enhanced low-dose-rate sensitivity."
- 232.B. Jun, H. D. Xiong, C. R. Cirba, R. D. Schrimpf, D. M. Fleetwood, and S. Cristoloveanu, "Total dose effects on double gate fully depleted SOI MOSFETs."
- 233.S. Ducret, F. Saigne, J. Boch, R. D. Schrimpf, D. M. Fleetwood, J. R. Vaille, L. Dusseau, J. P. David, and R. Ecoffet, "Effect of thermal annealing on radiation induced degradation of bipolar technologies when the dose rate is switched from high to low."
- 234.J. Boch, F. Saigne, S. Ducret, R. D. Schrimpf, D. M. Fleetwood, P. Iacconi, and L. Dusseau, "Total dose effects on bipolar integrated circuits: characterization of the saturation region."
- 235.B. Jun, Y. V. White, R. Pasternak, S. N. Rashkeev, R. D. Schrimpf, D. M. Fleetwood, N. H. Tolk, F. Brunier, N. Bresson, and S. Cristoloveanu, "Charge trapping in irradiated SOI wafers measured by second harmonic generation."

Monterey, CA, July 21-25, 2003

- 236.S. N. Rashkeev, D. M. Fleetwood, R. D. Schrimpf, and S. T. Pantelides, "Effects of Electric Field on Radiation-Induced Dopant Deactivation by Hydrogen."
- 237.J. A. Felix, D. M. Fleetwood, R. D. Schrimpf, M. R. Shaneyfelt, J. R. Schwank, P. E. Dodd, E. P. Gusev, and C. D'Emic, "Radiation-Induced Charge Trapping in Thin $\text{Al}_2\text{O}_3/\text{SiO}_x\text{N}_y/\text{Si}$ (100) Gate Dielectric Stacks." *Best Paper Nominee*.
- 238.B. Jun, R. D. Schrimpf, D. M. Fleetwood, and S. Cristoloveanu, "Charge Separation Techniques for Irradiated Pseudo-MOS SOI Transistors."
- 239.X. Hu, A. P. Karmarkar, D. M. Fleetwood, R. D. Schrimpf, R. D. Geril, R. A. Weller, B. D. White, M. Bataiev, J. L. Brillson, and U. K. Mishra, "Proton-Irradiation Effects on AlGaIn/GaN High Electron Mobility Transistors."
- 240.J. Boch, R. Cizmarik, R. D. Schrimpf, D. M. Fleetwood, and F. Saigne, "Impact of Mechanical Stress on Total-Dose Effects in Bipolar Transistors."
- 241.R. A. Weller, A. L. Sternberg, L. W. Massengill, R. D. Schrimpf, and D. M. Fleetwood, "Evaluating Average and Atypical Response in Radiation Effects Simulations."
- 242.B. D. White, M. Bataiev, S. A. Ringel, L. J. Brillson, X. Hu, D. M. Fleetwood, R. D. Schrimpf, S. T. Pantelides, and W. J. Schaff, "Electrical and Spectral Properties of 1.8 MeV Proton Irradiated AlGaIn/GaN HEMT Structures as a Function of Proton Fluence."
- 243.R. Pasternak, A. Chatterjee, Y. V. Shirokaya, B. K. Choi, Z. Marka, J. K. Miller, Y. Jiang, R. G. Albridge, S. N. Rashkeev, S. T. Pantelides, R. D. Schrimpf, D. M. Fleetwood, and N. H. Tolk, "Contactless Ultra-Fast Laser Probing of Radiation-Induced Leakage Current in Ultra-Thin Oxides."

Phoenix, AZ, July 15-19, 2002

- 244.D. M. Fleetwood, H. D. Xiong, Z. Y. Lu, C. J. Nicklaw, J. A. Felix, R. D. Schrimpf, and S. T. Pantelides, "Unified Model of Hole Trapping, $1/f$ Noise, and Thermally Stimulated Current in MOS Devices." *Meritorious Conference Paper Award*.
- 245.H. D. Xiong, D. M. Fleetwood, B. K. Choi, and A. L. Sternberg, "Temperature Dependence and Irradiation Response of $1/f$ Noise in MOSFETs."
- 246.J. A. Felix, D. M. Fleetwood, R. D. Schrimpf, J. G. Hong, G. Lucovsky, J. R. Schwank, and M. R. Shaneyfelt, "Total Dose Radiation Response of Hafnium Silicate Capacitors."
- 247.S. N. Rashkeev, C. R. Cirba, D. M. Fleetwood, R. D. Schrimpf, S. T. Pantelides, S. C. Witzak, and A. Michez, "Physical Model for Enhanced Interface-Trap Formation at Low Dose Rates." *Meritorious Conference Paper Award*.
- 248.B. K. Choi, R. D. Schrimpf, D. M. Fleetwood, L. W. Massengill, K. F. Galloway, M. R. Shaneyfelt, T. L. Meisenheimer, P. E. Dodd, J. R. Schwank, Y. M. Lee, R. S. Johnson, and G. Lucovsky, "Long-Term Reliability Degradation of Ultra-Thin Dielectric Films due to Heavy-Ion Irradiation." *Best Paper Nominee*.
- 249.C. J. Nicklaw, Z. Y. Lu, D. M. Fleetwood, R. D. Schrimpf, and S. T. Pantelides, "The Structure, Properties, and Dynamics of Oxygen Vacancies in Amorphous SiO_2 ."
- 250.H. J. Barnaby, S. K. Smith, R. D. Schrimpf, D. M. Fleetwood, and R. L. Pease, "Analytical Model for Proton Radiation Effects in Bipolar Devices."
- 251.X. Hu, B. K. Choi, H. J. Barnaby, D. M. Fleetwood, R. D. Schrimpf, K. F. Galloway, R. A. Weller, K. McDonald, and R. Dettmer, "Proton-Induced Degradation in AlGaAs/GaAs Heterojunction Bipolar Transistors."
- 252.B. D. White, M. Bataiev, L. J. Brillson, B. K. Choi, D. M. Fleetwood, R. D. Schrimpf, S. T. Pantelides, R. W. Dettmer, W. J. Schaff, and U. K. Mishra, "Characterization of 1.8 MeV Proton Irradiated AlGaIn/GaN Field-Effect Transistor Structures by Nanoscale Depth-Resolved Luminescence Spectroscopy."
- 253.M. R. Shaneyfelt, R. L. Pease, J. R. Schwank, M. C. Maher, G. L. Hash, D. M. Fleetwood, P. E. Dodd, C. A. Reber, S. C. Witzak, L. C. Riewe, H. P. Hjalmarson, J. C. Banks, B. L. Doyle, and J. A. Knapp, "Impact of Passivation Layers on Enhanced Low-Dose-Rate Sensitivity and Thermal-Stress Effects in Linear Bipolar ICs." *Outstanding Conference Paper Award*.

Vancouver, BC, July 16-20, 2001

- 254.S. N. Rashkeev, D. M. Fleetwood, R. D. Schrimpf, and S. T. Pantelides, "Proton-Induced Defect Generation at the Si/SiO₂ Interface."

Dan Fleetwood, CV: May 2018

- 255.J. A. Felix, D. M. Fleetwood, L. C. Riewe, M. R. Shaneyfelt, and P. S. Winokur, "Bias and Frequency Dependence of Radiation-Induced Charge Trapping in MOS Devices." *Best paper nominee.*
- 256.L. W. Massengill, B. K. Choi, D. M. Fleetwood, R. D. Schrimpf, M. R. Shaneyfelt, T. L. Meisenheimer, P. E. Dodd, J. R. Schwank, Y. M. Lee, R. S. Johnson, and G. Lucovsky, "Heavy-Ion-Induced Breakdown in Ultrathin Gate Oxides." *Meritorious Conference Paper Award.*
- 257.B. D. White, L. J. Brillson, D. M. Fleetwood, R. D. Schrimpf, and S. T. Pantelides, "Detection of Trap Activation by Ionizing Radiation in SiO₂ by Spatially Localized Cathodoluminescence Spectroscopy."
- 258.A. Karmarkar, B. K. Choi, R. D. Schrimpf, and D. M. Fleetwood, "Aging and Baking Effects on the Radiation Hardness of MOS Capacitors."

Reno, NV, July 24-28, 2000

- 259.D. M. Fleetwood, L. C. Riewe, P. S. Winokur, and F. W. Sexton, "Electrical Breakdown of Irradiated Oxides During Current-Temperature Stress."
- 260.H. J. Barnaby, R. D. Schrimpf, D. M. Fleetwood, R. L. Pease, T. Turflinger, P. Cole, J. Krieg, and M. C. Maher, "Origins of Total-Dose Response Variability in LM111 Comparators."
- 261.S. T. Pantelides, S. N. Rashkeev, R. Buczko, D. M. Fleetwood, and R. D. Schrimpf, "Reactions of Mobile Hydrogen with the Si-SiO₂ Interface." *Best paper nominee.*
- 262.B. D. White, L. J. Brillson, S. C. Lee, D. M. Fleetwood, R. D. Schrimpf, S. T. Pantelides, Y. M. Lee, and G. Lucovsky, "Low Energy Electron-Excited Nanoscale Luminescence: A Tool to Detect Trap Activation by Ionizing Radiation."
- 263.P. E. Bunson, M. Di Ventra, S. T. Pantelides, D. M. Fleetwood, and R. D. Schrimpf, "Hydrogen Related Defects in Irradiated SiO₂."
- 264.C. J. Nicklaw, M. P. Pagey, S. T. Pantelides, D. M. Fleetwood, R. D. Schrimpf, K. F. Galloway, J. E. Wittig, B. M. Howard, E. Taw, W. H. McNeil, and J. F. Conley, Jr., "Defects and Nanocrystals Generated by Si Implantation into a-SiO₂."
- 265.C. R. Cirba, Y. Li, H. J. Barnaby, R. D. Schrimpf, D. M. Fleetwood, and S. Kosier, "Determining Energy Distributions of Interface Traps in Gate-Controlled Semiconductor Devices."
- 266.H. P. Hjalmarsen, S. C. Witczak, P. A. Schultz, D. J. Bowman, and D. M. Fleetwood, "A Mechanism for Enhanced Low-Dose-Rate Degradation in Bipolar Transistors."
- 267.S. C. Lee, A. Raparla, Y. F. Li, G. Gasiot, R. D. Schrimpf, D. M. Fleetwood, K. F. Galloway, M. Featherby, and D. Johnson, "Total Dose Effects in Composite Nitride-Oxide (NO) Films and Optimizing Composite Layer Thickness for Minimizing Threshold Voltage Shift."
- 268.M. R. Shaneyfelt, J. R. Schwank, S. C. Witczak, L. C. Riewe, P. S. Winokur, G. L. Hash, R. L. Pease, and D. M. Fleetwood, "Thermal-Stress Effects on Enhanced Low-Dose-Rate Sensitivity of Linear Bipolar Circuits." *Best paper nominee.*
- 269.N. H. Tolks, S. K. Singh, Z. Marka, W. Wang, S. N. Rashkeev, S. T. Pantelides, S. C. Lee, R. D. Schrimpf, and D. M. Fleetwood, "Characterization of X-ray Radiation Damage in Gate and Isolation Oxides Using Second Harmonic Generation."
- 270.J. R. Schwank, M. R. Shaneyfelt, R. A. Loemker, B. L. Draper, P. E. Dodd, S. C. Witczak, L. C. Riewe, V. Ferlet-Cavrois, P. Paillet, J. L. Leray, and D. M. Fleetwood, "Correlation Between Co-60 and X-ray Exposures on Radiation-Induced Charge Buildup in Silicon-on-Insulator Buried Oxides."

Norfolk, VA, July 12-16, 1999

- 271.D. M. Fleetwood, P. S. Winokur, L. C. Riewe, O. Flament, P. Paillet, and J. L. Leray, "The Role of Electron Transport and Trapping in MOS Total-Dose Modeling."
- 272.O. Flament, P. Paillet, J. L. Leray, and D. M. Fleetwood, "Consideration on Isochronal Anneal Technique: From Measurement to Physics."
- 273.K. Vanheusden, P. P. Korambath, H. A. Kurtz, S. P. Karna, D. M. Fleetwood, W. M. Shedd, and R. D. Pugh, "The Effect of Near-Interface Network Strain on Proton Trapping in SiO₂."

Newport Beach, CA, July 20-24, 1998

- 274.D. M. Fleetwood, P. S. Winokur, M. R. Shaneyfelt, L. C. Riewe, O. Flament, P. Paillet, and J. L. Leray, "Effects of Isochronal Annealing and Irradiation Temperature on Radiation-Induced Trapped Charge."

Dan Fleetwood, CV: May 2018

- 275.F. W. Sexton, D. M. Fleetwood, M. R. Shaneyfelt, P. E. Dodd, G. L. Hash, L. P. Schanwald, R. A. Loemker, and K. S. Krisch, "Precursor Ion Damage and Angular Dependence of Single Event Gate Rupture in Thin Oxides." *Best Paper Nominee*.
- 276.K. Vanheusden, D. M. Fleetwood, J. R. Schwank, M. R. Shaneyfelt, T. L. Meisenheimer, and B. L. Draper, "The Effects of Irradiation and Proton Implantation on the Density of Mobile Protons in SiO₂ Films."
- 277.S. C. Witzcak, R. C. Laco, D. C. Mayer, D. M. Fleetwood, R. D. Schrimpf, and K. F. Galloway," Space Charge Limited Degradation of Bipolar Oxides at Low Electric Fields." *Outstanding Conference Paper Award*.
- 278.R. J. Graves, C. R. Cirba, R. D. Schrimpf, R. J. Milanowski, F. Saigne, A. Michez, D. M. Fleetwood, and S. C. Witzcak, "Modeling Low-Dose-Rate Effects in Irradiated Bipolar-Base Oxides."
- 279.S. C. Witzcak, R. C. Laco, D. C. Mayer, R. D. Schrimpf, H. J. Barnaby, K. F. Galloway, R. L. Pease, and D. M. Fleetwood, "Measurement Bias Dependence of Enhanced Bipolar Gain Degradation at Low Dose Rate." *Best Paper Nominee*.

Snowmass, CO, July 21-25, 1997

- 280.D. M. Fleetwood, M. J. Johnson, T. L. Meisenheimer, and P. S. Winokur, "Latent Interface Traps and 1/f Noise in Irradiated MOS Devices," *Meritorious Conference Paper Award*.
- 281.D. M. Fleetwood , "Revised Model of Thermally Stimulated Current in MOS Capacitors."
- 282.F. W. Sexton, D. M. Fleetwood, M. R. Shaneyfelt, P. E. Dodd, and G. L. Hash, "Single Event Gate Rupture in Thin Gate Oxides," *Outstanding Conference Paper Award*.
- 283.W. L. Warren, K. Vanheusden, D. M. Fleetwood, J. R. Schwank, P. S. Winokur, and M. J. Knoll "Nonvolatile Field Effect Transistors Based on Protons and Si/SiO₂/Si Structures."
- 284.S. C. Witzcak, R. D. Schrimpf, D. M. Fleetwood, R. C. Laco, D. C. Mayer, K. F. Galloway, J. M. Puhl, R. L. Pease, and J. S. Suehle, "Evaluation of Temperature-Enhanced Gain Degradation of Vertical NPN and Lateral PNP Bipolar Transistors," *Meritorious Conference Paper Award*.
- 285.M. Simons, R. L. Pease, D. M. Fleetwood, J. R. Schwank, and M. Krzesniak, "Dose Enhancement in a Room Co-60 Source."
- 286.M. R. Shaneyfelt, P. S. Winokur, D. M. Fleetwood, G. L. Hash, J. R. Schwank, F. W. Sexton, and R. L. Pease, "Impact of Aging on Radiation Hardness," *Best Paper Nominee*.
- 287.A. Wu, R. D. Schrimpf, R. L. Pease, D. M. Fleetwood, and S. L. Kosier, "Radiation-Induced Gain Degradation in Lateral PNP PJT's with Lightly and Heavily Doped Emitters."
- 288.R. L. Pease, D. B. Brown, L. Cohn, D. M. Fleetwood, and A. H. Johnston, "A Proposed Hardness Assurance Test Methodology for Bipolar Linear Circuits and Devices in a Space Ionizing Radiation Environment."
- 289.K. Vanheusden, S. P. Karna, R. D. Pugh, J. R. Schwank, W. L. Warren, D. M. Fleetwood, and R. A. B. Devine, "Irradiation Response of Mobile Protons in Buried SiO₂."
- 290.M. Simons, R. L. Pease, D. M. Fleetwood, J. R. Schwank, M. Krzesniak, T. Turflinger, J. Buaron, L. C. Riewe, W. T. Kemp, P. W. C. Duggan, J. M. Puhl, A. H. Johnston, M. Wiedeman, R. E. Mills, A. G. Holmes-Seidle, L. M. Cohn, H. Doane, and W. Lohmeier, "Common-Source TLD and RADFET Characterization of Co-60, Cs-137, and X-ray Irradiation Sources," *Outstanding Presentation, 1997 IEEE Radiation Effects Data Workshop*.

Indian Wells, CA, July 15-19, 1996

- 291.D. M. Fleetwood, L. C. Riewe, J. R. Schwank, S. C. Witzcak, and R. D. Schrimpf, "Radiation Effects at Low Electric Fields in Thermal, SIMOX, and Bipolar-Base Oxides," *Outstanding Conference Paper Award*.
- 292.W. L. Warren, K. Vanheusden, D. M. Fleetwood, J. R. Schwank, M. R. Shaneyfelt, P. S. Winokur, and R. A. B. Devine, "Over-Coordinated O Centers in SIMOX and Thermal Oxides," *Best Paper Nominee*.
- 293.D. M. Schmidt, A. Wu, R. D. Schrimpf, D. M. Fleetwood, R. L. Pease, and W. E. Combs, "Modeling Ionizing Radiation Induced Gain Degradation of the Lateral PNP BJT," *Best Paper Nominee*.
- 294.S. C. Witzcak, R. D. Schrimpf, K. F. Galloway, D. M. Fleetwood, R. L. Pease, J. M. Puhl, D. M. Schmidt, W. E. Combs, and J. S. Suehle, "Accelerated Tests for Simulating Low Dose Rate Gain Degradation of Lateral and Substrate PNP Bipolar Junction Transistors," *Meritorious Conference Paper Award*.

Madison, WI, July 17-21, 1995

- 295.D. M. Fleetwood, W. L. Warren, J. R. Schwank, P. S. Winokur, M. R. Shaneyfelt, and L. C. Riewe. "Effects of Interface Traps and Border Traps on MOS Postirradiation Annealing Response," *Outstanding Conference Paper Award*.

Dan Fleetwood, CV: May 2018

- 296.D. M. Schmidt, D. M. Fleetwood, R. D. Schrimpf, R. L. Pease, R. J. Graves, G. H. Johnson, K. F. Galloway, and W. E. Combs, "Comparison of Ionizing Radiation-Induced Gain Degradation in Lateral, Substrate, and Vertical PNP BJT's."
- 297.R. D. Schrimpf, R. J. Graves, D. M. Schmidt, D. M. Fleetwood, R. L. Pease, W. E. Combs, and M. DeLaus, "Hardness Assurance Issues for Lateral PNP Bipolar Junction Transistors." ***Voted Outstanding Oral Presentation of Conference; Meritorious Conference Paper Award.***
- 298.W. L. Warren, M. R. Shaneyfelt, D. M. Fleetwood, and P. S. Winokur, "Microscopic Nature of Defect Centers in Doped Oxides," *Best Paper Nominee.*

Tucson, AZ, July 18-22, 1994

- 299.D. M. Fleetwood, R. A. Reber, Jr., P. S. Winokur, S. L. Kosier, R. D. Schrimpf, A. Wei, R. N. Nowlin, M. DeLaus, R. L. Pease, and W. E. Combs, "Physical Mechanisms Contributing to Enhanced Bipolar Gain Degradation at Low Dose Rates." ***Meritorious Conference Paper Award.***
- 300.M. R. Shaneyfelt, D. M. Fleetwood, J. R. Schwank, T. L. Meisenheimer, and P. S. Winokur, "Role of Burn-in During Qualification Testing." ***Meritorious Conference Paper Award.***
- 301.R. N. Nowlin, D. M. Fleetwood, and R. D. Schrimpf, "Saturation of the Dose-Rate Response of Single-Poly BJT's Below 10 rad(SiO₂)/s: Implications for Hardness Assurance."
- 302.P. Khosropour, D. M. Fleetwood, K. F. Galloway, R. D. Schrimpf, and P. Calvel, "Estimating Low-Dose-Rate Irradiation Response of MOSFETs."
- 303.W. L. Warren, M. R. Shaneyfelt, D. M. Fleetwood, J. R. Schwank, P. S. Winokur, R. A. B. Devine, and D. Mathiot, "Microscopic Nature of Border Traps in MOS Devices," *Best Paper Nominee.*
- 304.N. S. Saks, M. Simons, D. M. Fleetwood, J. T. Yount, and P. M. Lenahan, "Radiation Effects in Oxynitrides Grown in N₂O," *Best Paper Nominee.*
- 305.S. L. Kosier, A. Wei, R. D. Schrimpf, W. E. Combs, D. M. Fleetwood, M. DeLaus, and R. L. Pease, "Bounding the Total-Dose Response of Modern Bipolar Transistors."
- 306.R. L. Pease, S. L. Kosier, R. D. Schrimpf, W. E. Combs, M. DeLaus, and D. M. Fleetwood, "Correlation of Hot-Carrier Stress and Ionization Induced Degradation in Bipolar Transistors."

Snowbird, UT, July 19-23, 1993

- 307.D. M. Fleetwood, M. R. Shaneyfelt, L. C. Riewe, P. S. Winokur, and R. A. Reber, Jr., "Surprising Effects of High-Temperature Biased Annealing on the Postirradiation Electrical Response of MOS Devices." ***Meritorious Conference Paper Award.***
- 308.R. N. Nowlin, D. M. Fleetwood, R. D. Schrimpf, R. L. Pease, and W. E. Combs, "Hardness Assurance and Testing Issues for Bipolar/BiCMOS Devices," *Best Paper Nominee.*
- 309.T. S. Mayer, D. M. Fleetwood, D. E. Beutler, J. A. Cooper, and M. R. Melloch, "Unexpected Increase in the Thermal Generation Rate of Bulk GaAs Due to Electron-Beam Metallization."
- 310.J. R. Schwank, D. M. Fleetwood, M. R. Shaneyfelt, and P. S. Winokur, "A Critical Comparison of Charge-Pumping, Dual Transistor, and Midgap Measurement Techniques."
- 311.M. R. Shaneyfelt, D. M. Fleetwood, P. S. Winokur, J. R. Schwank, and T. L. Meisenheimer, "Effects of Device Scaling and Geometry on MOS Radiation Hardness Assurance."
- 312.S. L. Kosier, R. D. Schrimpf, R. N. Nowlin, D. M. Fleetwood, M. DeLaus, R. L. Pease, W. E. Combs, A. Wei, and F. Chai, "Charge Separation for Bipolar Transistors."
- 313.W. L. Warren, M. R. Shaneyfelt, J. R. Schwank, D. M. Fleetwood, P. S. Winokur, R. A. B. Devine, W. P. Maszara, and J. B. McKitterick, "Paramagnetic Defect Centers in Irradiated BESOI and SIMOX Buried Oxides."

New Orleans, LA, July 13-17, 1992

- 314.D. M. Fleetwood, S. L. Miller, R. A. Reber, Jr., P. J. McWhorter, and P. S. Winokur, "New Insights into Radiation-Induced Oxide-Trap Charge Through Thermally-Stimulated-Current Measurement and Analysis," *Best Paper Nominee.*
- 315.F. W. Sexton, D. M. Fleetwood, C. C. Aldridge, G. Garrett, J. C. Pelletier, and J. I. Gaona, "Qualifying Commercial ICs for Total-Dose Space Environments."
- 316.J. R. Schwank, D. M. Fleetwood, M. R. Shaneyfelt, P. S. Winokur, C. L. Axness, and L. C. Riewe, "Latent Interface-Trap Buildup: Issues for Long-Term Device Response," *Best Paper Nominee.*
- 317.M. R. Shaneyfelt, J. R. Schwank, D. M. Fleetwood, P. S. Winokur, K. L. Hughes, G. L. Hash, and M. P. Connors, "Interface-Trap Buildup Rates in Wet and Dry Oxides."

Dan Fleetwood, CV: May 2018

San Diego, CA, July 15-19, 1991

- 318.D. M. Fleetwood, R. A. Reber, Jr., and P. S. Winokur, "Effect of Bias on Thermally Stimulated Current (TSC) in Irradiated MOS Devices," *Best Paper Nominee*.
- 319.T. L. Meisenheimer, D. M. Fleetwood, M. R. Shaneyfelt, and L. C. Riewe, "1/f Noise in N- and P-Channel MOS Devices Through Irradiation and Annealing."
- 320.M. R. Shaneyfelt, K. L. Hughes, J. R. Schwank, F. W. Sexton, D. M. Fleetwood, P. S. Winokur, and E. W. Enlow, "Wafer-Level Testing for Hardness Assurance."
- 321.M. R. Shaneyfelt, D. M. Fleetwood, J. R. Schwank, and K. L. Hughes, "Comparison of Low-Energy X-ray and Cobalt-60 Irradiations of MOS Devices as a Function of Gate Bias."
- 322.J. H. Scofield and D. M. Fleetwood, "Physical Basis for Nondestructive Tests of MOS Radiation Hardness."
- 323.D. M. Fleetwood, P. S. Winokur, and T. L. Meisenheimer, "Hardness Assurance for Low-Dose Space Applications," *Best Paper Nominee*.

Reno, Nevada, July 16-20, 1990

- 324.D. M. Fleetwood, P. S. Winokur, and L. C. Riewe, "Predicting Switched-Bias Response from Steady State Irradiations."
- 325.P. S. Winokur, F. W. Sexton, D. M. Fleetwood, M. D. Terry, P. V. Dressendorfer, M. R. Shaneyfelt, and J. R. Schwank, "Implementing QML for Radiation Hardness Assurance."
- 326.T. L. Meisenheimer and D. M. Fleetwood, "Effect of Radiation-Induced Charge on 1/f Noise in MOS Devices."
- 327.M. R. Shaneyfelt, J. R. Schwank, D. M. Fleetwood, P. S. Winokur, and F. W. Sexton, "Field Dependence of Interface-Trap Buildup in Polysilicon and Metal Gate MOS Devices."

Marco Island, Florida, July 24-28, 1989

- 328.D. M. Fleetwood, J. R. Schwank, P. S. Winokur, F. W. Sexton, and M. R. Shaneyfelt, "Dual Transistor Method to Determine Threshold Voltage Shifts due to Oxide-Trapped and Interface-Trapped Charge in MOS Transistors," *Best Paper Nominee*.
- 329.D. M. Fleetwood, P. S. Winokur, L. C. Riewe, and R. L. Pease, "An Improved Standard Total-Dose Test for CMOS Space Electronics."
- 330.P. J. McWhorter, D. M. Fleetwood, R. A. Pastorek, and G. T. Zimmerman, "Comparison of MOS Capacitor and Transistor Postirradiation Response."
- 331.J. H. Scofield, T. P. Doerr, N. A. Schwadron, and D. M. Fleetwood, "1/f Noise: A Nondestructive Technique to Predict MOS Radiation Hardness?"
- 332.J. R. Schwank, F. W. Sexton, D. M. Fleetwood, M. R. Shaneyfelt, K. L. Hughes, and M. S. Rodgers, "Evaluation of Lot Acceptance Tests Using CMOS ICs."

Portland, Oregon, July 12-15, 1988

- 333.D. M. Fleetwood, P. S. Winokur, and J. R. Schwank, "Using Laboratory X-ray and Cobalt-60 Irradiations to Predict CMOS Device Response in Strategic and Space Environments," *Outstanding Conference Paper Award*.
- 334.D. M. Fleetwood, S. S. Tsao, and P. S. Winokur, "Total Dose Hardness Assurance Issues for SOI MOSFETs."
- 335.D. M. Fleetwood, D. E. Beutler, L. J. Lorence, Jr., D. B. Brown, B. L. Draper, L. C. Riewe, H. B. Rosenstock, and D. P. Knott, "How Much Do We Know About X-ray Dose Enhancement Effects on MOS Oxides?"
- 336.J. R. Schwank, F. W. Sexton, D. M. Fleetwood, R. V. Jones, R. S. Flores, M. S. Rodgers, and D. T. Sanders, "Temperature Effects on the Radiation Response of MOS Devices," *Best Paper Nominee*.
- 337.W. Beezhold, D. E. Beutler, D. M. Fleetwood, R. L. Hospelhorn, and D. P. Knott, "Resolution of Computer Predictions and Measured Dose Enhancement Effects in CMOS Diodes in a Medium-Energy X-ray Environment."
- 338.D. E. Beutler, W. Beezhold, J. S. Browning, D. M. Fleetwood, M. Connors, C. L. Freshman, D. P. Knott, and N. E. Counts, "Comparison of Photocurrent Enhancement and Upset Enhancement in CMOS Devices in a Medium-Energy X-Ray Environment."
- 339.C. L. Axness, J. R. Schwank, P. S. Winokur, J. S. Browning, R. Koga, and D. M. Fleetwood, "Single-Event Upset in 16k CMOS SRAMs in Space Satellite Environments."

Snowmass, Colorado, July 28-31, 1987

- 340.D. M. Fleetwood, P. V. Dressendorfer, and D. C. Turpin, "A Reevaluation of Worst-Case Postirradiation Response for Hardened MOS Transistors."
- 341.D. M. Fleetwood and P. V. Dressendorfer, "A Simple Method to Predict Radiation and Annealing Biases that Lead to Worst-Case CMOS Static RAM Postirradiation Response," *Best Paper Nominee*.
- 342.J. R. Schwank, D. M. Fleetwood, P. S. Winokur, P. V. Dressendorfer, D. C. Turpin, and D. T. Sanders, "The Role of Hydrogen in Radiation-Induced Defect Formation in Polysilicon-Gate CMOS Devices."
- 343.D. E. Beutler, D. M. Fleetwood, W. Beezhold, D. Knott, L. J. Lorence, Jr, and B. L. Draper, "Variations in Semiconductor Response in a Medium-Energy X-ray Dose-Enhancing Environment."
- 344.S. S. Tsao, D. M. Fleetwood, H. T. Weaver, L. Pfeiffer, and G. K. Celler, "Radiation-Tolerant, Sidewall-Hardened SOI/MOS Transistors."
- 345.C. M. Dozier, D. M. Fleetwood, D. B. Brown, and P. S. Winokur, "Sandia/NRL Interlaboratory Comparison of Low-Energy X-ray and Cobalt-Irradiations of MOS Transistors."

Providence, Rhode Island, July 21-23, 1986

- 346.D. M. Fleetwood, P. S. Winokur, L. J. Lorence, Jr., W. Beezhold, P. V. Dressendorfer, and J. R. Schwank, "The Response of MOS Devices to Dose-Enhanced Low-Energy Radiation."
- 347.D. M. Fleetwood, R. W. Beegle, F. W. Sexton, P. S. Winokur, S. L. Miller, R. K. Treece, J. R. Schwank, R. V. Jones, and P. J. McWhorter, "Using a 10-keV X-ray Source for Hardness Assurance."
- 348.J. R. Schwank, P. S. Winokur, F. W. Sexton, D. M. Fleetwood, J. H. Perry, P. V. Dressendorfer, D. T. Sanders, and D. C. Turpin, "Radiation-Induced Interface-State Generation in MOS Devices."
- 349.P. S. Winokur, F. W. Sexton, J. R. Schwank, D. M. Fleetwood, P. V. Dressendorfer, T. F. Wrobel, and D. C. Turpin, "Total-Dose Radiation and Annealing Studies: Implications for Hardness Assurance Testing," *Best Paper Nominee*.

Monterey, California, July 22-24, 1985

- 350.D. M. Fleetwood, P. S. Winokur, R. W. Beegle, P. V. Dressendorfer, and B. L. Draper, "Accounting for Dose-Enhancement Effects with CMOS Transistors."
- 351.J. D. McBrayer, D. M. Fleetwood, R. A. Pastorek, and R. V. Jones, "Correlation of Hot-Carrier and Radiation Effects in MOS Transistors."
- 352.P. S. Winokur, E. B. Errett, D. M. Fleetwood, P. V. Dressendorfer, and D. C. Turpin, "Optimizing and Controlling the Radiation Hardness of a Si-Gate CMOS Process." *Outstanding Conference Paper Award*.

Presentations at RADECS (Radiation Effects on Components and Systems) Conferences

- 353.P. F. Wang, E. X. Zhang, K. H. Chuang, W. Liao, H. Gong, P. Wang, C. N. Arutt, K. Ni, M. W. McCurdy, I. Verbauwhede, E. Bury, D. Linten, D. M. Fleetwood, R. D. Schrimpf, and R. A. Reed, "X-ray and proton radiation effects on 40 nm CMOS physically unclonable function devices," RADECS 2017, Geneva, Switzerland, Oct. 2-6, 2017.
- 354.G. Borghello, F. Faccio, E. Lerario, S. Michelis, S. Kulis, D. M. Fleetwood, R. D. Schrimpf, S. Gerardin, A. Paccagnella, and S. Bonaldo, "Dose rate sensitivity of 65 nm MOSFETs exposed to ultra-high doses," RADECS 2017, Geneva, Switzerland, Oct. 2-6, 2017.
- 355.X. J. Li, J. Q. Yang, C. M. Liu, D. M. Fleetwood, H. J. Barnaby, and K. F. Galloway, "Hydrogen soaking and displacement damage effects in gated lateral bipolar junction transistors," RADECS 2017, Geneva, Switzerland, Oct. 2-6, 2017.
- 356.R. A. Austin, B. D. Sierawski, J. M. Trippe, A. L. Sternberg, K. M. Warren, R. A. Reed, R. A. Weller, R. D. Schrimpf, M. L. Alles, L. W. Massengill, D. M. Fleetwood, G. W. Buxton, III, J. C. Brandenburg, W. B. Fisher, and R. Davis, "RadFxSat: A flight campaign for recording single-event effects in commercial off-the-shelf microelectronics," RADECS 2017, Geneva, Switzerland, Oct. 2-6, 2017.
- 357.R. M. Chen, N. N. Mahatme, Z. J. Diggins, L. Wang, E. X. Zhang, Y. P. Chen, Y. N. Liu, B. Narasimham, A. F. Witulski, B. L. Bhuvu, and D. M. Fleetwood, "Analysis of temporal masking in master and slave type flip-flop SEUs and related applications," RADECS 2017, Geneva, Switzerland, Oct. 2-6, 2017.
- 358.R. Jiang, E. X. Zhang, X. Shen, J. Chen, K. Ni, P. Wang, D. M. Fleetwood, R. D. Schrimpf, S. W. Kaun, E. C. H. Kyle, J. S. Speck, and S. T. Pantelides, "Total ionizing dose effects in passivated and unpassivated AlGaIn/GaN HEMTs," RADECS 2016, Bremen, Germany, Sept. 19-23, 2016.
- 359.K. Ni, E. X. Zhang, J. A. Kozub, R. Jiang, R. D. Schrimpf, R. A. Reed, D. M. Fleetwood, M. L. Alles, J. Lin, A. Vardi, and J. A. del Alamo, "Understanding charge collection mechanisms in InGaAs FinFETs using high-

- speed pulsed-laser transient testing with tunable wavelength,” RADECS 2016, Bremen, Germany, Sept. 19-23, 2016.
- 360.R. M. Chen, Z. J. Diggins, N. N. Mahatme, L. Wang, E. X. Zhang, Y. P. Chen, H. Zhang, Y. N. Liu, B. Narasimham, A. F. Witulski, B. L. Bhuvu, and D. M. Fleetwood, “Effects of temperature and supply voltage on SEU- and SET-induced errors in bulk 40-nm sequential circuits,” RADECS 2016, Bremen, Germany, Sept. 19-23, 2016.
- 361.R. M. Chen, N. N. Mahatme, Z. J. Diggins, L. Wang, E. X. Zhang, Y. P. Chen, Y. N. Liu, B. Narasimham, A. F. Witulski, B. L. Bhuvu, and D. M. Fleetwood, “Impact of temporal masking of flip-flop upsets on soft error rates of sequential circuits,” RADECS 2016, Bremen, Germany, Sept. 19-23, 2016.
- 362.S. L. Weeden-Wright, S. L. Gollub, R. Harl, A. B. Hmelo, D. M. Fleetwood, B. R. Rogers, R. D. Schrimpf, and D. G. Walker, “Radiation effects on the photoluminescence of rare-earth doped pyrochloric powders,” RADECS 2012, Biarritz, France, Sept. 24-28, 2012.
- 363.S. Bhandaru, E. X. Zhang, D. M. Fleetwood, R. A. Reed, R. A. Weller, and S. M. Weiss, “Accelerated oxidation of silicon due to x-ray irradiation,” RADECS 2011, Seville, Spain, Sept. 19-23, 2011.
- 364.S. A. Francis, C. X. Zhang, E. X. Zhang, D. M. Fleetwood, R. D. Schrimpf, K. F. Galloway, E. Simoen, J. Mitard, and C. Claeys, “Comparison of charge pumping and $1/f$ noise in irradiated Ge pMOSFETs,” RADECS 2011, Seville, Spain, Sept. 19-23, 2011.
- 365.N. L. Rowsey, M. E. Law, R. D. Schrimpf, D. M. Fleetwood, B. R. Tuttle, and S. T. Pantelides, “Radiation induced oxide charge in low- and high- H_2 environments,” RADECS 2011, Seville, Spain, Sept. 19-23, 2011.
- 366.Y. F. Li, M. Li, R. D. Schrimpf, D. M. Fleetwood, B. Zhang, J. Q. Wang, Y. Wang, and D. L. Wang, “Characterizing, modeling, and simulating soft error susceptibility in cell-based designs in highly scaled technologies,” RADECS 2011, Seville, Spain, Sept. 19-23, 2011.
- 367.C. X. Zhang, S. A. Francis, E. X. Zhang, D. M. Fleetwood, R. D. Schrimpf, K. F. Galloway, E. Simoen, J. Mitard, and C. Claeys, “Effect of ionizing radiation on defects and $1/f$ noise in Ge pMOSFETs,” RADECS 2010, Langenfeld, Austria, Sept. 20-24, 2010.
- 368.R. Arinero, A. Touboul, F. Saigne, E. X. Zhang, N. Rezzak, R. D. Schrimpf, D. M. Fleetwood, B. K. Choi, and A. Hmelo, “1.8 MeV proton radiation effects on substrate resistivity of n-type MOS capacitors,” RADECS 2010, Langenfeld, Austria, Sept. 20-24, 2010.
- 369.R. Arora, J. Mitard, E. Simoen, E. X. Zhang, D. M. Fleetwood, B. K. Choi, R. D. Schrimpf, K. F. Galloway, S. R. Kulkarni, M. Meuris, and C. Claeys, “Effects of halo doping and Si capping layer thickness on total-dose effects in Ge p-MOSFETs,” RADECS 2009, Bruges, Belgium, Sept. 14-18, 2009.
- 370.I. Batyrev, D. M. Fleetwood, R. D. Schrimpf, and S. T. Pantelides, “The role of water in the radiation response of wet and dry oxides,” RADECS 2007, Deauville, France, Sept. 10-14, 2007.
- 371.A. Kalavagunta, A. Touboul, R. D. Schrimpf, D. M. Fleetwood, R. A. Reed, R. K. Jain, L. Shen, and U. K. Mishra, “Electrostatic mechanisms responsible for device degradation in AlGaN/AlN/GaN HEMTs,” RADECS 2007, Deauville, France, Sept. 10-14, 2007. *Best Paper Nominee*.
- 372.J. D. Black, B. L. Bhuvu, M. L. Alles, L. W. Massengill, D. M. Fleetwood, R. D. Schrimpf, and K. F. Galloway, “Static and dynamic power comparison of hardened-by-design transistor-based circuits designed in a commercial 130 nm technology,” RADECS 2006, Athens, Greece, Sept. 27-29, 2006.
- 373.D. K. Chen, R. D. Schrimpf, D. M. Fleetwood, K. F. Galloway, A. Dimoulas, A. Sotiropoulos, and Y. Panayiotatos, “Total dose response of Ge MOS capacitors with HfO_2/Dy_2O_3 gate stacks,” RADECS 2006, Athens, Greece, Sept. 27-29, 2006.
- 374.J. R. Schwank, F. W. Sexton, M. R. Shaneyfelt, and D. M. Fleetwood, “Hardness assurance test issues for high dose rate environments,” RADECS 2006, Athens, Greece, Sept. 27-29, 2006.
- 375.R. R. Cizmarik, R. D. Schrimpf, D. M. Fleetwood, K. F. Galloway, D. G. Platteter, M. R. Shaneyfelt, R. L. Pease, J. Boch, D. R. Ball, J. D. Rowe, and M. C. Maher, “The impact of mechanical stress on the total-dose response of linear bipolar transistors with various passivation layers,” RADECS2004 Workshop, Madrid, Spain, Sept. 22-24, 2004.
- 376.J. Boch, F. Saigne, R. D. Schrimpf, D. M. Fleetwood, and R. Cizmarik, “Elevated Temperature Irradiation at High Dose Rate of Commercial Linear Bipolar IC’s,” RADECS ‘03, Noordwijk, The Netherlands, Sept. 15-19, 2003.
- 377.J. Boch, F. Saigne, R. D. Schrimpf, D. M. Fleetwood, S. Ducret, L. Dusseau, J-P. David, J. Fesquet, J. Gasiot, and R. Ecoffet, “Effect of Switching from High to Low Dose Rate on Linear Bipolar Technology Radiation Response,” RADECS ‘03, Noordwijk, The Netherlands, Sept. 15-19, 2003.

- 378.X. Hu, B. K. Choi, H. J. Barnaby, D. M. Fleetwood, R. D. Schrimpf, S. C. Lee, S. Shojah-Ardalan, R. Wilkins, U. K. Mishra, and R. Dettmer, "The Energy Dependence of Proton-Induced Degradation in AlGaIn/GaN High Electron Mobility Transistors," RADECS2002 Workshop, Padova, Italy, September 16-18, 2002.
- 379.P. Paillet, V. Ferlet-Cavrois, J. R. Schwank, and D. M. Fleetwood, "Response of SIMOX and UNIBOND buried oxides: Trapping and detrapping properties," RADECS '99, Fontevraud, France, Sept. 13-17, 1999.
- 380.R. L. Pease, M. R. Shaneyfelt, P. S. Winokur, D. M. Fleetwood, J. Gorelick, S. McClure, S. Clark, D. Alexander, and L. Cohn, "Mechanisms for Enhanced Packaging and/or Burn-In Total Dose Sensitivity in Microelectronics," RADECS '97, Cannes, France, Sept. 15-19, 1997.
- 381.M. R. Shaneyfelt, J. R. Schwank, D. M. Fleetwood, and P. S. Winokur, "Effects of Temperature on MOS Radiation Response," RADECS '97, Cannes, France, Sept. 15-19, 1997.
- 382.M. R. Shaneyfelt, P. S. Winokur, D. M. Fleetwood, J. R. Schwank, and R. A. Reber, Jr., "Effects of Reliability Screens on MOS Charge Trapping," RADECS '95, Arcachon, France, Sept. 18-22, 1995.

Presentations made at Conferences on Hardened Electronics and Radiation Technology

- 383.R. A. Reed, M. P. King, B. Sierawski, A. Dasgupta, R. A. Weller, D. M. Fleetwood, M. H. Mendenhall, K. M. Warren, and R. D. Schrimpf, "Radiation response of advanced semiconductors," Orlando, FL, March 28 – April 1, 2011.
- 384.R. A. Weller, A. L. Sternberg, A. Kobayashi, L. W. Massengill, R. D. Schrimpf, and D. M. Fleetwood, "Modeling Semiconductor Device Response Using Detailed Radiation Event Simulations," Monterey, California, March 1-5, 2004. **Meritorious Conference Paper Award.**
- 385.C. R. Cirba, H. J. Barnaby, J. M. Hutson, J. A. Felix, R. D. Schrimpf, and D. M. Fleetwood, "Modeling Oxide Trapped Charge Annealing Processes in Irradiated SOI MOSFETs," Albuquerque, New Mexico, March 13-16, 1995.
- 386.D. M. Fleetwood, M. R. Shaneyfelt, W. L. Warren, J. R. Schwank, and P. S. Winokur, "Charge Trapping in Field Oxides," Albuquerque, New Mexico, March 13-16, 1995. **Outstanding Conference Paper Award.**

Monterey, California, February 14-17, 1994

- 387.M. R. Shaneyfelt, D. M. Fleetwood, T. L. Meisenheimer, J. R. Schwank, and P. S. Winokur, "Radiation Response of Hardened Field Oxides Before and After Elevated Temperature Anneals."
- 388.T. L. Meisenheimer, D. M. Fleetwood, M. R. Shaneyfelt, and P. S. Winokur, "Temperature Dependence of Static RAM Volatility."

Monterey, California, February 13-16, 1990

- 389.M. R. Shaneyfelt, J. R. Schwank, D. M. Fleetwood, and F. W. Sexton, "MOS Process Development for Ultrahardened Applications."
- 390.J. R. Schwank, F. W. Sexton, M. R. Shaneyfelt, D. M. Fleetwood, K. L. Hughes, and M. S. Rodgers, "CMOS IC Response in Simulated NPB (Neutral Particle Beam) Environments." **Outstanding Conference Paper Award.**

Melbourne, Florida, February 7-10, 1989

- 391.D. M. Fleetwood, J. R. Schwank, F. W. Sexton, P. S. Winokur, G. L. Hash, and M. R. Shaneyfelt, "Lot Acceptance Strategy for Reentry Vehicle CMOS Electronics."
- 392.S. S. Tsao, D. M. Fleetwood, T. R. Guilinger, and M. J. Kelly, "Materials for Radiation-Hard Buried Insulators in SOI Technology."

El Toro, California, Feb. 1-4, 1988

- 393.D. M. Fleetwood, F. V. Thome, S. S. Tsao, V. J. Dandini, J. R. Schwank, and P. V. Dressendorfer, "High-Temperature Silicon-on-Insulator Electronics for Space Nuclear Power Systems: Requirements and Feasibility."
- 394.S. S. Tsao, H. T. Weaver, and D. M. Fleetwood, "Sidewall-Hardening Process for Silicon-on-Insulator MOSFETS." **Outstanding Conference Paper Award.**
- 395.D. E. Beutler, W. Beezhold, D. P. Knott, E. F. Hartman, L. J. Lorence, Jr., and D. M. Fleetwood, "Angular and Spectral Dependence of X-Ray-Induced Photocurrent Enhancement for Kovar/Au-Lidded CMOS Devices."

Newport, Rhode Island, July 24-25, 1986

- 396.F. W. Sexton, J. R. Schwank, P. S. Winokur, D. M. Fleetwood, and P. V. Dressendorfer, "Silicon-Gate Device Response in a Satellite-Based SDI Environment."
- 397.W. Beezhold, D. M. Fleetwood, L. J. Lorence, Jr., D. Knott, P. S. Winokur, and N. E. Counts, "Dose-Enhancement Effects for Medium-Energy X-Ray Irradiations of Reentry Vehicle Electronic Devices."
- 398.J. R. Schwank, D. M. Fleetwood, P. S. Winokur, P. S. Hund, and E. C. DasKalos, "Process Effects on the Radiation Hardness of Polysilicon Gate CMOS ICs."

Presentations at IEEE Semiconductor Interface Specialists Conferences

- 399.P. Wang, R. Jiang, E. X. Zhang, H. Gong, S. Zhao, R. D. Schrimpf, and D. M. Fleetwood, "Gate voltage dependence of $1/f$ noise of GaN/AlGaIn HEMTs," San Diego, CA, Dec. 8-10, 2016.
- 400.M. Bhuiyan, X. Lou, X. Gong, H. Zhou, K. Ni, R. Jiang, H. Gong, E. X. Zhang, R. G. Gordon, R. A. Reed, D. M. Fleetwood, P. D. Ye, and T. P. Ma, "Radiation induced charge trapping in epitaxial La_2O_3 gate dielectric grown on GaAs," San Diego, CA, Dec. 8-10, 2016.
- 401.M. Bhuiyan, H. Zhou, S.-J. Chang, X. Lou, X. Gong, K. Ni, R. Jiang, H. Gong, E. X. Zhang, C.-H. Won, R. G. Gordon, J.-W. Lim, J.-H. Lee, R. A. Reed, D. M. Fleetwood, P. D. Ye, and T. P. Ma, "Total ionizing dose effects on GaN-based HEMTs and MOSHEMTs: Effects of channel thickness and epitaxial MgCaO as gate dielectric," San Diego, CA, Dec. 8-10, 2016.
- 402.S. Ren, J. Zhang, M. Si, K. Ni, X. Wan, J. Chen, X. Sun, E. X. Zhang, D. M. Fleetwood, P. D. Ye, S. Cui, and T. P. Ma, "Total ionizing dose effects on GaAs MOSFETs with epitaxial high-k gate dielectrics," Arlington, VA, Dec. 2-5, 2015.
- 403.S. Ren, M. Si, K. Ni, S. Chang, X. Sun, E. X. Zhang, D. M. Fleetwood, P. D. Ye, S. Cui, and T. P. Ma, "A study of factors affecting radiation hardness of InGaAs nanowire gate-all-around MOSFETs," San Diego, CA, Dec. 10-13, 2014.
- 404.S. Ren, X. Sun, M. Si, E. X. Zhang, J. Chen, D. M. Fleetwood, P. D. Ye, S. Cui, and T. P. Ma, "Total ionizing dose (TID) effects on ultrathin InGaAs nanowire gate-all-around MOSFETs with ALD Al_2O_3 gate dielectrics," Washington, DC, Dec. 5-7, 2013.
- 405.G. X. Duan, C. X. Zhang, E. X. Zhang, D. M. Fleetwood, R. D. Schrimpf, R. A. Reed, D. Linten, and J. Mitard, "Negative bias temperature instabilities in SiGe-pMOSFETs with $\text{SiO}_2/\text{HfO}_2$ gate dielectrics," Washington, DC, Dec. 5-7, 2013.
- 406.E. X. Zhang, C. X. Zhang, D. M. Fleetwood, R. D. Schrimpf, S. Dhar, and S-H. Ryu, "Bias-temperature instabilities in 4H-SiC MOS capacitors," San Diego, CA, Dec. 2-4, 2010.
- 407.E. X. Zhang, D. M. Fleetwood, F. El-Mamouni, D. R. Ball, M. L. Alles, R. D. Schrimpf, W. Xiong, S. Cristoloveanu, "Charge trapping effects on memory windows in SOI FinFET ZRAM transistors," Washington, DC, Dec. 3-5, 2009.
- 408.X. J. Zhou, D. M. Fleetwood, I. Danciu, A. Dasgupta, S. A. Francis, and A. D. Touboul, "Effects of strained Si-Si bonds and O vacancies near the SiO_2/Si interface," Washington, DC, Dec. 6-8, 2007.
- 409.X. J. Zhou, D. M. Fleetwood, L. Tsetseris, R. D. Schrimpf, S. T. Pantelides, J. A. Felix, E. P. Gusev, and C. D'Emic, "Effects of irradiation and bias-temperature stress on charge trapping in HfO_2 Gate Dielectrics," Washington, DC, Dec. 1-3, 2005.
- 410.J. A. Felix, M. R. Shaneyfelt, D. M. Fleetwood, E. P. Gusev, R. D. Schrimpf, and C. D'Emic, "The Effects of Interfacial Layer Thickness and Processing on the Radiation Response of High-K/ $\text{SiO}_x\text{N}_y/\text{Si}$ (100) Gate Dielectric Stacks," Washington, DC, Dec. 4-6, 2003.
- 411.J. A. Felix, D. M. Fleetwood, R. D. Schrimpf, J. G. Hong, G. Lucovsky, J. R. Schwank, and M. R. Shaneyfelt, "Radiation Response and Reliability of Hafnium Silicate Capacitors," San Diego, CA, Dec. 5-7, 2002.
- 412.S. N. Rashkeev, C. R. Cirba, D. M. Fleetwood, R. D. Schrimpf, S. C. Witzak, A. Michez, and S. T. Pantelides, "Physical Model for Enhanced Interface-Trap Formation at Low Dose Rates," San Diego, CA, Dec. 5-7, 2002.
- 413.S. N. Rashkeev, D. M. Fleetwood, R. D. Schrimpf, and S. T. Pantelides, "Proton-Induced Defect Generation at the Si/ SiO_2 Interface," Washington, DC, Nov. 29 to Dec. 1, 2001.
- 414.D. M. Fleetwood, J. A. Felix, L. C. Riewe, and P. S. Winokur, "Effects of Alternating Bias Irradiation on Defects in MOS Devices," San Diego, CA, Dec. 7-9, 2000.
- 415.S. N. Rashkeev, R. Buczko, D. M. Fleetwood, R. D. Schrimpf, and S. T. Pantelides, "Reactions of Hydrogen with Si-SiO₂ Interfaces," San Diego, CA, Dec. 7-9, 2000.
- 416.D. M. Fleetwood, L. C. Riewe, and F. W. Sexton, "Breakdown During High-Field Bias-Temperature Stress," Charleston, SC, Dec. 2-4, 1999.

- 417.D. M. Fleetwood, P. S. Winokur, O. Flament, and P. S. Winokur, "Stability of Trapped Electrons in SiO₂," San Diego, CA, Dec. 3-5, 1998.
- 418.F. W. Sexton, D. M. Fleetwood, and K. S. Krisch, "Mechanisms of Heavy-Ion Induced Gate Rupture in Thin Oxides," San Diego, CA, Dec. 3-5, 1998.
- 419.K. Vanheusden, R. A. B. Devine, D. M. Fleetwood, and W. L. Warren, "Hydrogen Diffusion and Chemistry During the Annealing-Induced Generation of Mobile Protons in the Oxide Layer of Si/SiO₂/Si Capacitors," San Diego, CA, Dec. 3-5, 1998.
- 420.K. Vanheusden, W. L. Warren, L. B. Archer, D. M. Fleetwood, R. A. B. Devine, B. L. Draper, J. R. Schwank, M. R. Shaneyfelt, P. S. Winokur, and R. M. Wallace, "Generation Kinetics and Thermal Stability of Mobile Protons in SiO₂ Thin Films," Charleston, SC, Dec. 4-6, 1997.

San Diego, CA, Dec. 5-7, 1996

- 421.D. M. Fleetwood and R. D. Schrimpf, "Enhanced Low-Rate Radiation-Induced Charge Trapping at the Emitter-Base/Oxide Interface of Bipolar Devices."
- 422.K. Vanheusden, W. L. Warren, D. M. Fleetwood, and R. A. B. Devine, "Temperature Dependence of Electron Capture by Protons (H⁺) in SiO₂ Thin Films."

Charleston, SC, Dec. 7-9, 1995

- 423.D. M. Fleetwood, W. L. Warren, J. R. Schwank, P. S. Winokur, M. R. Shaneyfelt, and L. C. Riewe, "Fast and Slow Border Traps in MOS Devices."
- 424.K. Vanheusden, W. L. Warren, J. R. Schwank, D. M. Fleetwood, M. R. Shaneyfelt, P. S. Winokur, and R. A. B. Devine, "Paramagnetic Interface Traps in High-Temperature Annealed Si/SiO₂/Si Structures."

San Diego, CA, Dec. 7-10, 1994

- 425.D. M. Fleetwood and N. S. Saks, "Density and Energy of Oxide-Trap Charge due to High-Field Stress."
- 426.W. L. Warren, D. M. Fleetwood, M. R. Shaneyfelt, J. R. Schwank, P. S. Winokur, and R. A. B. Devine, "Identity of Border Traps in SiO₂ Films."
- 427.M. R. Shaneyfelt, D. M. Fleetwood, J. R. Schwank, T. L. Meisenheimer, and P. S. Winokur, "Effects of Reliability Screens on MOS Charge Trapping."
- 428.R. A. B. Devine, W. L. Warren, and D. M. Fleetwood, "On the Nature of Annealing Induced Interfacial and Bulk Oxide Degradation in Si/SiO₂/Si Structures."

Ft. Lauderdale, FL, Dec. 8-11, 1993

- 429.D. M. Fleetwood, M. R. Shaneyfelt, and J. R. Schwank, "Simple Method to Estimate MOS Oxide-Trap, Interface-Trap, and Border-Trap Densities."
- 430.W. L. Warren, D. M. Fleetwood, M. R. Shaneyfelt, J. R. Schwank, P. S. Winokur, and R. A. B. Devine, "Delocalized Spin Centers in SiO₂ Thin Films."
- 431.R. A. B. Devine, W. L. Warren, and D. M. Fleetwood, "Point Defect Generation and Oxide Degradation During Annealing of the Si/SiO₂ Interface."

San Diego, CA, Dec. 9-12, 1992

- 432.D. M. Fleetwood, S. L. Miller, and R. A. Reber, Jr, "Energy Distribution of Trapped Holes in Irradiated SiO₂."
- 433.M. R. Shaneyfelt, J. R. Schwank, D. M. Fleetwood, and P. S. Winokur, "Effect of Oxide Thickness on Interface-Trap Buildup Rates."

Orlando, FL, Dec. 11-14, 1991

- 434.D. M. Fleetwood, R. A. Reber, Jr., and P. S. Winokur, "Hole and Electron Trapping in Irradiated MOS Devices."
- 435.J. R. Schwank, D. M. Fleetwood, M. R. Shaneyfelt, and P. S. Winokur, "Latent, Thermally-Activated Interface-Trap Generation in MOS Devices."

San Diego, CA, Dec. 5-8, 1990

- 436.D. M. Fleetwood and J. H. Scofield, "Correlation Between Preirradiation Channel Resistance and Postirradiation Interface-Trap Charge in MOS Transistors."
- 437.T. L. Meisenheimer and D. M. Fleetwood, "Effect of Oxide and Interface-Trap Charge on 1/f Noise in MOS Devices."

- 438.M. R. Shaneyfelt, J. R. Schwank, D. M. Fleetwood, and P. S. Winokur, "Hole-Trapping/Hydrogen Transport (HT²) Model for Interface-Trap Buildup in MOS Devices."

Ft. Lauderdale, FL, Dec. 6-9, 1989

- 439.D. M. Fleetwood, "Radiation Induced Charge Neutralization and Interface-Trap Buildup in MOS Devices."
440.J. H. Scofield, N. Schwadron, and D. M. Fleetwood, "Correlation Between 1/f Noise of MOSFETs and Oxide Trapped Charge Following Co-60 Irradiation."

San Diego, CA, Dec. 14-16, 1986

- 441.J. R. Schwank, P. S. Winokur, P. V. Dressendorfer, and D. M. Fleetwood, "Radiation-Induced Interface-Traps in Polysilicon Gate MOS Devices."

Ft. Lauderdale, FL, Dec. 5-7, 1985

- 442.J. D. McBrayer, D. M. Fleetwood, R. A. Pastorek, and R. V. Jones, "Damage Due to Hot-Carrier and Radiation Effects in MOS Transistors."

Contributed Talks at Electrochemical (ECS) or Materials Research Society (MRS) Meetings

- 443.S. H. Lee, R. D. Schrimpf, D. M. Fleetwood, and D. Linten, "Retention instability of low-resistance state in metal-oxide RRAM," Fall Materials Research Meeting, Boston, MA, Nov. 29 – Dec. 4, 2015.
444.Y. Puzyrev, X. Shen, K. Ni, C. X. Zhang, J. Hachtel, B. Choi, M. Chisholm, D. M. Fleetwood, R. D. Schrimpf, and S. T. Pantelides, "Memristive switching of self-assembled ZnO nanorods," Fall Materials Research Meeting, Boston, MA, Nov. 29 – Dec. 4, 2015.
445.Z. Zhang, A. R. Arehart, E. C. H. Kyle, J. Chen, E. X. Zhang, D. M. Fleetwood, R. D. Schrimpf, J. S. Speck, and S. A. Ringel, "Proton irradiation effects on deep level states in *p*-type GaN," Reliability and Materials Issues of Semiconductors-Optical and Electron Devices and Materials III, Spring Materials Research Society Meeting, San Francisco, CA, April 6-10, 2015.
446.E. X. Zhang, D. M. Fleetwood, G. X. Duan, C. X. Zhang, R. D. Schrimpf, E. Simoen, and D. Linten, "Fin width and gate length dependences of charge pumping and DCIV currents in floating-body SOI MOSFETs," Fall Electrochemical Society Meeting, Oct. 7-12, 2012.
447.E. X. Zhang, C. X. Zhang, D. M. Fleetwood, R. D. Schrimpf, S. Dhar, S.-H. Ryu, X. Shen, and S. T. Pantelides, "Bias-temperature instabilities and radiation effects on SiC MOSFETs," in *Silicon Nitride, Silicon Dioxide, and Emerging Dielectrics 11*, Spring Meeting of the Electrochemical Society, Montreal, QC, May 2-6, 2011.
448.R. Arora, D. M. Fleetwood, R. D. Schrimpf, K. F. Galloway, B. G. Schmidt, B. R. Rogers, K. B. Chung, and G. Lucovsky, "Temperature stress response of germanium MOS with HfSiON dielectric," in *Silicon Nitride, Silicon Dioxide, and Emerging Dielectrics 10*, Spring Meeting of the Electrochemical Society, San Francisco, CA, May 25-29, 2009.
449.R. Pasternak, B. Jun, R. D. Schrimpf, D. M. Fleetwood, M. Alles, R. Dolan, R. Standley, and N. Tolk, "Investigation of second-harmonic generation for SOI wafer metrology," 12th International Symposium on SOI Technology and Devices, 207th Meeting of The Electrochemical Society, Quebec City, QC, May 15-20, 2005.
450.L. Tsetseris, X. J. Zhou, D. M. Fleetwood, R. D. Schrimpf and S. T. Pantelides, "Physical mechanisms of negative-bias temperature instability, MRS Spring Meeting, San Francisco, CA, March 28 – April 1, 2005.
451.L. Tsetseris, X. Zhou, D. M. Fleetwood, R. D. Schrimpf, and S. T. Pantelides, "Field-Induced Reactions of Water Molecules at Si-Dielectric Interfaces," MRS Fall Meeting, Boston, MA, Dec. 1-5, 2003.
452.C. R. Cirba, S. Cristoloveanu, R. D. Schrimpf, L. C. Feldman, D. M. Fleetwood, and K. F. Galloway, "Total-Dose Radiation Hardness of Double-Gate Ultra-Thin SOI MOSFETs," 203rd Meeting of The Electrochemical Society, Paris, France, April 27 – May 2, 2003.
453.H. P. Hjalmarson, P. A. Schultz, D. J. Bowman, and D. M. Fleetwood, "A Unified Computational Approach to Oxide Aging," Fall Meeting, Boston, MA, Nov. 30 – Dec. 4, 1998.
454.K. Vanheusden, W. L. Warren, R. A. B. Devine, D. M. Fleetwood, J. R. Schwank, P. S. Winokur, and Z. J. Lemnios, "Direct Observation of Mobile Protons in SiO₂ Thin Films: Potential Application in a Novel Memory Device," Fall Meeting, Boston, MA, Dec. 2-6, 1996.
455.W. L. Warren, K. Vanheusden, J. R. Schwank, D. M. Fleetwood, M. R. Shaneyfelt, P. S. Winokur, and R. A. B. Devine, "Positively Charged Over-Coordinated Oxygen Centers in SiO₂ Thin Films," Fall Meeting, Boston, MA, Dec. 2-6, 1996.

- 456.K. Vanheusden, W. L. Warren, J. R. Schwank, D. M. Fleetwood, M. R. Shaneyfelt, P. S. Winokur, and R. A. B. Devine, "Paramagnetic Interface Traps in High-Temperature Annealed Si/SiO₂/Si Structures," Spring Meeting, San Francisco, CA, April 8-12, 1996.
- 457.R. A. B. Devine, D. Mathiot, W. L. Warren, and D. M. Fleetwood, "Near-Interface Oxide Degradation in High-Temperature Annealed Si/SiO₂/Si Structures," Materials Research Society Meeting, Boston, MA, Nov. 29-Dec. 3, 1993.
- 458.R. A. B. Devine, W. L. Warren, M. R. Shaneyfelt, D. M. Fleetwood, and B. Aspar, "Oxide Modification Due to High-Temperature Processing of Si/SiO₂/Si Structures," European Materials Research Society Meeting, Strasbourg, France, May 4-7, 1993.

Contributed Talks at March American Physical Society Meetings

- 459.A. O'Hara, P. Wang, C. Perini, E. X. Zhang, D. M. Fleetwood, E. Vogel, and S. T. Pantelides, "Passivation and depassivation of defects in graphene-based FETs," March American Physical Society Meeting, New Orleans, LA, March 13-17, 2017.
- 460.Y. S. Puzyrev, X. Shen, K. Ni, C. X. Zhang, J. Hachtel, B. Choi, M. Chisholm, D. M. Fleetwood, R. D. Schrimpf, and S. T. Pantelides, "Memristive switching of ZnO nanorod mesh," March Meeting of The American Physical Society, March 14-18, 2016, Baltimore, MD.
- 461.K. H. Warnick, Y. Puzyrev, T. Roy, D. M. Fleetwood, R. D. Schrimpf, and S. T. Pantelides, "Field-enhanced vacancy diffusion in AlGa_N," March Meeting of The American Physical Society, Feb. 27 – Mar. 2, 2012, Boston, MA.
- 462.T. Roy, Y. S. Puzyrev, E. X. Zhang, D. M. Fleetwood, R. D. Schrimpf, S. T. Pantelides, "Defect energy distribution in GaN/AlGa_N heterostructures grown in Ga-rich and ammonia-rich conditions," March American Physical Society Meeting, Dallas, TX, March 21-25, 2011.
- 463.Y. S. Puzyrev, T. Roy, E. X. Zhang, D. M. Fleetwood, R. D. Schrimpf, and S. T. Pantelides, "Atomic displacements in proton-irradiated AlGa_N/GaN heterostructures," March American Physical Society Meeting, Dallas, TX, March 21-25, 2011.
- 464.Y. S. Puzyrev, B. R. Tuttle, R. D. Schrimpf, D. M. Fleetwood, and S. T. Pantelides, "Theory of hot-carrier-induced phenomena in GaN HEMTs," Portland, OR, March 15-19, 2010.
- 465.N. Sergueev, Y. S. Puzyrev, M. Beck, K. Varga, R. D. Schrimpf, D. M. Fleetwood, and S. T. Pantelides, "Ion-induced quantum transport in ultrathin a-SiO₂ films," Portland, OR, March 15-19, 2010.
- 466.Y. S. Puzyrev, M. Beck, B. Tuttle, R. D. Schrimpf, D. M. Fleetwood, and S. T. Pantelides, "Interaction of hydrogen with defects in Ga_N," Pittsburgh, PA, March 16-20, 2009.
- 467.X. J. Zhou, D. M. Fleetwood, R. D. Schrimpf, L. Gonella, and F. Faccio, "Transition from high to low 1/f noise regimes in field oxide field effect transistors," New Orleans, LA, March 10-14, 2008.
- 468.M. J. Beck, D. M. Fleetwood, R. D. Schrimpf, and S. T. Pantelides, "Disorder-recrystallization effects following low-energy beam-solid interactions," New Orleans, LA, March 10-14, 2008.
- 469.A. Dasgupta, S. A. Francis, and D. M. Fleetwood, "Effects of aging and humidity on low-frequency noise of MOS transistors," New Orleans, LA, March 10-14, 2008.
- 470.A. G. Marinopoulos, I. Batyrev, X. J. Zhou, R. D. Schrimpf, D. M. Fleetwood, and S. T. Pantelides, "H-shuttling within a Hf-defect complex in Si/SiO₂/HfO₂ structures," New Orleans, LA, March 10-14, 2008.
- 471.I. G. Batyrev, L. Tsetseris, D. M. Fleetwood, R. D. Schrimpf, and S. T. Pantelides, "Reactions of water molecules at the Si/SiO₂ interface," Denver, CO, March 5-9, 2007.
- 472.I. G. Batyrev, S. T. Pantelides, M. P. Rodgers, D. M. Fleetwood, and R. D. Schrimpf, "New SiOH complexes and proton release mechanism in silica as a source of SiO₂ interface trap buildup," Baltimore, MD, March 13-17, 2006.
- 473.L. Tsetseris, X. J. Zhou, D. M. Fleetwood, R. D. Schrimpf, and S. T. Pantelides, "Hole-controlled defect formation at Si-SiO₂ interfaces in the presence of water and fluorine-related species," Montreal, Quebec, March 22-26, 2004.
- 474.R. Pasternak, Y. V. Shirokaya, Z. Marka, J. K. Miller, S. N. Rashkeev, S. T. Pantelides, N. H. Tolk, B. K. Choi, D. M. Fleetwood, and R. D. Schrimpf, "Contactless Characterization of Carrier Injection and Recombination Processes at Semiconductor Interfaces Using Second-Harmonic Generation," Austin, TX, March 3-7, 2003.
- 475.H. D. Xiong and D. M. Fleetwood, "Temperature Dependence of 1/f Noise in MOSFETs," Indianapolis, IN, March 18-22, 2002.
- 476.Z. Y. Lu, C. J. Nicklaw, D. M. Fleetwood, R. D. Schrimpf, and S. T. Pantelides, "The Structure, Properties, and Dynamics of Oxygen Vacancies in Amorphous SiO₂," Indianapolis, IN, March 18-22, 2002.

- 477.R. Pasternak, Z. Marka, Y. V. Shirokaya, S. N. Rashkeev, S. T. Pantelides, B. K. Choi, D. M. Fleetwood, R. D. Schrimpf, and N. H. Tolk, "Changes in Carrier Dynamics at Si/SiO₂ Interfaces After X-ray Irradiation Detected by Electric Field Induced Second-Harmonic Generation," Indianapolis, IN, March 18-22, 2002.
- 478.J. H. Scofield, N. P. Borland, and D. M. Fleetwood, "Temperature and Gate-Voltage Dependencies of Random Telegraph Noise Due to Oxide Traps in Small Gate-Area MOSFETs," Bull. Am. Phys. Soc. 38, 633 (1993), Seattle, WA, March 22-26, 1993.
- 479.D. M. Fleetwood, R. A. Reber, Jr., and P. S. Winokur, "Temperature and Radiation-Induced Trapped-Positive-Charge Neutralization in MOS Devices," Bull. Amer. Phys. Soc. 37, 773 (1992), Indianapolis, IN, March 16-20, 1992.
- 480.J. H. Scofield, N. P. Borland, and D. M. Fleetwood, "Temperature- and Gate-Voltage Dependencies of the Low-Frequency Noise of Small Gate Area MOSFETs," Bull. Amer. Phys. Soc. 37, 267 (1992), Indianapolis, IN, March 16-20, 1992.
- 481.D. M. Fleetwood and J. H. Scofield, "Correlation Between 1/f Noise and Radiation-Induced-Hole Trapping in MOSFETs," Bull. Amer. Phys. Soc. 35, 445, Anaheim, CA, March 12-16, 1990.
- 482.D. M. Fleetwood, J. T. Masden, and N. Giordano, "1/f Noise in Thin Platinum Wires and Films," Bull. Amer. Phys. Soc. 28, 460 (1983), Los Angeles, CA, March 21-25, 1983.
- 483.D. M. Fleetwood and N. Giordano, "Experimental Study of 1/f Noise in Tin," Bull. Amer. Phys. Soc. 27, 217 (1982), Dallas, TX, March 8-12, 1982.

Other Contributed Talks

- 484.D. M. Fleetwood, R. Jiang, E. X. Zhang, and R. D. Schrimpf, "Voltage-stress induced defects in AlGaIn/GaN HEMTs," Microelectronics Reliability and Qualification Workshop, El Segundo, CA, Feb. 6-8, 2018.
- 485.D. M. Fleetwood, "IEEE Nuclear and Plasma Sciences Society's Distinguished Lecture Program," IEEE Sections Congress, Sydney, Australia, Aug. 11-13, 2017.
- 486.R. Jiang, X. Shen, E. X. Zhang, J. Chen, D. M. Fleetwood, R. D. Schrimpf, S. W. Kaun, E. C. H. Kyle, J. S. Speck, and S. T. Pantelides, "Oxygen-impurity-induced hot-carrier degradation and total-ionizing-dose effects in unpassivated AlGaIn/GaN HEMTs," 2017 International Workshop on Reliability of Micro- and Nano-Electronics in Harsh Environment, Chengdu, China, May 22-24, 2017. (Outstanding Student Paper)
- 487.S. E. Zhao, R. Jiang, E. X. Zhang, and D. M. Fleetwood, "Using Capacitance-Frequency Measurements to Estimate Interface and Border Trap Charge Densities in MOS Devices," 2017 International Workshop on Reliability of Micro- and Nano-Electronics in Harsh Environment, Chengdu, China, May 22-24, 2017.
- 488.B. D. Sierawski, R. A. Reed, K. M. Warren, A. L. Sternberg, R. A. Austin, J. M. Trippe, R. A. Weller, M. L. Alles, R. D. Schrimpf, L. W. Massengill, D. M. Fleetwood, G. W. Buxton, III, J. C. Brandenburg, W. B. Fisher, and R. Davis, "CubeSat: Real-time soft error measurements at low earth orbits," IEEE Intl. Reliability Physics Sympos., Monterey, CA, April 2-6, 2017.
- 489.M. L. Alles, K. Bolotin, A. Zettl, B. Homeijer, J. L. Davidson, R. D. Schrimpf, R. A. Reed, and D. M. Fleetwood, "Radiation effects in M&NEMs," Gomactech 2016, Orlando, FL, March 14-17.
- 490.B. Mallick, A. Chatterjee, G. Setlur, V. Koldyaev, D. M. Fleetwood, N. Tolk, and R. D. Schrimpf, "Modeling saturation of second harmonic generation in Si/dielectric system: An ultra-sensitive non-invasive metrological tool," 24th DAE-BRNS National Laser Symposium, RRCAT, Incore, India, Dec. 2-5, 2015.
- 491.E. Farzana, Z. Zhang, E. C. H. Kyle, E. X. Zhang, D. M. Fleetwood, R. D. Schrimpf, J. S. Speck, A. R. Arehart, and S. A. Ringel, "Comparison of electron and proton irradiation-induced traps in n-type GaN," 57th Electronic Materials Conference, Columbus, OH, Jun. 24-26, 2015. (**Best student paper.**)
- 492.M. L. Alles, R. D. Schrimpf, D. M. Fleetwood, R. A. Reed, K. Ni, I. Samsel, and E. X. Zhang, "What vs. why: Characterization for insight," NASA Electronic Parts and Packaging Program Electronics Technology Workshop, Greenbelt, MD, Jun. 23-26, 2015.
- 493.V. Koldyaev, M. C. Kryger, J. P. Changala, M. L. Alles, D. M. Fleetwood, R. D. Schrimpf, and N. H. Tolk, "Rapid non-destructive detection of sub-surface Cu in SOI wafers by optical second harmonic generation," SEMI Advanced Semiconductor Manufacturing Conference, Saratoga Springs, NY, May 3-6, 2015.
- 494.S. Ren, M. Si, K. Ni, S. Chang, X. Sun, E. X. Zhang, D. M. Fleetwood, P. D. Ye, S. Cui, T. P. Ma, "A study of radiation hardness of InGaAs nanowire gate-all-around MOSFETs," Gomactech 2015, St. Louis, MO, March 23-26, 2015.
- 495.S. J. Koester, C. Kim, Y. Su, R. D. Schrimpf, D. M. Fleetwood, M. L. Alles, R. A. Reed, C. X. Zhang, and E. X. Zhang, "Radiation effects in field-effect transistors based upon 2D materials," Gomactech 2015, St. Louis, MO, March 23-26, 2015.

- 496.A. Sasikumar, Z. Zhang, P. Kumar, E. X. Zhang, B. Poling, G. D. Via, E. Heller, D. M. Fleetwood, R. D. Schrimpf, P. Saunier, C. Lee, S. A. Ringel, and A. R. Arehart, "Comparison of radiation and electrical stressors on AlGaIn/GaN HEMT reliability," Gomactech 2015, St. Louis, MO, March 23-26, 2015.
- 497.I. K. Samsel, E. X. Zhang, K. Ni, R. A. Reed, R. D. Schrimpf, D. M. Fleetwood, R. A. Weller, M. W. McCurdy, and M. L. Alles, "Physical mechanisms for radiation-induced effects in non-Si channel CMOS devices," Gomactech 2015, St. Louis, MO, March 23-26, 2015. **(Best student poster.)**
- 498.D. M. Fleetwood, J. Chen, T. Roy, E. X. Zhang, Y. Puzyrev, S. T. Pantelides, R. D. Schrimpf, E. C. H. Kyle, B. McSkimming, S. Kaun, and J. S. Speck, "1/f noise and defects in GaN/AlGaIn HEMTs," Microelectronics Quality and Reliability Workshop, El Segundo, CA, Jan. 27-29, 2015.
- 499.W. T. Holman, B. D. Sierawski, R. A. Reed, R. A. Weller, A. L. Sternberg, R. Austin, and D. M. Fleetwood, "The small satellite (CubeSat) Program as a pedagogical framework for the undergraduate EE curriculum," 121 ASEE Conference, Indianapolis, IN, June 15-18, 2014.
- 500.M. Si, J. Gu, P. Ye, S. Ren, X. Sun, S. Cui, T. P. Ma, E. X. Zhang, and D. M. Fleetwood, "Performance and radiation response of InGaAs gate-all-around nanowire MOSFETs," GOMACTech 2014, Charleston, SC, March 31 – April 3, 2014.
- 501.S. Koester, C. Kim, R. D. Schrimpf, D. M. Fleetwood, M. L. Alles, R. A. Reed, and E. X. Zhang, "Radiation effects in 2D material/high-K dielectric interfaces," GOMACTech 2014, Charleston, SC, March 31 – April 3, 2014.
- 502.A. Arehart, A. Sasikumar, Z. Zhang, P. Kumar, S. Ringel, E. X. Zhang, D. M. Fleetwood, R. D. Schrimpf, B. Poling, G. Via, E. Heller, P. Saunier, and C. Lee, "Comparison of irradiation and electrical stressors on AlGaIn/GaN HEMT reliability," GOMACTech 2014, Charleston, SC, March 31 – April 3, 2014.
- 503.J. S. Speck, Z. Zhang, A. R. Arehart, E. Cinkilic, J. Chen, E. X. Zhang, Y. S. Puzyrev, C. X. Zhang, M. W. McCurdy, S. T. Pantelides, B. McSkimming, S. W. Kaun, E. C. H. Kyle, D. M. Fleetwood, R. D. Schrimpf, and S. A. Ringel, "Proton irradiation in bulk GaN layers and nitride-based HEMT devices," GOMACTech 2014, Charleston, SC, March 31 – April 3, 2014.
- 504.E. X. Zhang, I. K. Samsel, E. D. Funkhouser, W. G. Bennett, N. C. Hooten, M. W. McCurdy, D. M. Fleetwood, R. A. Reed, M. L. Alles, R. D. Schrimpf, R. A. Weller, D. Linten, and J. Mitard, "Heavy-ion and laser-induced transients in SiGe channel pMOSFETs," International Semiconductor Device Research Symposium, Bethesda, MD, Dec. 11-13, 2013.
- 505.S. Mukherjee, Y. Puzyrev, J. Chen, R. D. Schrimpf, D. M. Fleetwood, and S. T. Pantelides, "Modeling hot-carrier-induced degradation in AlGaIn/GaN HEMTs," Reliability of Compound Semiconductors Workshop, New Orleans, LA, May 13, 2013.
- 506.G. Gaur, D. S. Koktysh, D. M. Fleetwood, R. A. Reed, R. A. Weller and S. M. Weiss, "Effects of x-ray and gamma-ray irradiation on the optical properties of quantum dots immobilized in porous silicon," SPIE Defense, Security, and Sensing, Baltimore, MD, April 29 – May 3, 2013.
- 507.J. Bi, R. A. Reed, R. D. Schrimpf, D. M. Fleetwood, and Z. Han, "Neutron-Induced Single-Event-Transient Effects in Ultrathin-Body Fully-Depleted Silicon-on-Insulator MOSFETs," IEEE International Reliability Physics Symposium, Monterey, CA, April 14-18, 2013.
- 508.I. Chatterjee, E. X. Zhang, B. L. Bhuvu, D. M. Fleetwood, Y. P. Fang, and A. Oates, "Length and fin number dependence of ionizing radiation-induced degradation in bulk FinFETs," IEEE International Reliability Physics Symposium, Monterey, CA, April 14-18, 2013.
- 509.C. X. Zhang, E. X. Zhang, D. M. Fleetwood, M. L. Alles, R. D. Schrimpf, "Total ionizing dose effects and reliability in graphene-based non-volatile memory," IEEE Aerospace Conf, Big Sky, Montana, March 2-9, 2013.
- 510.R. D. Schrimpf, D. M. Fleetwood, S. T. Pantelides, Y. S. Puzyrev, X. Shen, J. Singh, J. M. Hinckley, U. K. Mishra, and J. S. Speck, "Multi-scale analysis of hot-electron-related device reliability," Proc. GOMACTech, Las Vegas, NV, March 11-14, 2013.
- 511.S. Mukherjee, Y. Puzyrev, J. Chen, R. D. Schrimpf, D. M. Fleetwood, and S. T. Pantelides, "Degradation prediction for AlGaIn/GaN HEMTs," Reliability Science for Advanced Materials and Devices, Golden, CO, Feb. 24-25, 2013.
- 512.E. X. Zhang, D. M. Fleetwood, C. X. Zhang, B. Wang, M. L. Alles, A. Newaz, R. D. Schrimpf, K. Bolotin, S. T. Pantelides, E. B. Song, S. Kim, K. Galatsis, and K. L. Wang, "UV ozone irradiation induced defect formation in graphene/PZT devices," 59th Annual Meeting of the American Vacuum Society, Tampa, FL, Oct. 29 – Nov. 2, 2012.

- 513.M. Li, Y. F. Li, R. D. Schrimpf, and D. M. Fleetwood, "Including process-related variability in soft error rate analysis of advanced logic design down to 28 nm based on a foundry PDK," IEEE International Conference on Solid-State and Integrated Circuit Technology, Xi'an, China, Oct. 29 – Nov. 1, 2012.
- 514.C. X. Zhang, E. X. Zhang, D. M. Fleetwood, R. D. Schrimpf, S. Dhar, S. H. Ryu, X. Shen, and S. T. Pantelides, "Bias-temperature instabilities and radiation effects on SiC MOS devices," Annual SiC MOS Workshop, College Park, MD, USA, August 16-17, 2012.
- 515.S. Mukherjee, Y. S. Puzyrev, J. M. Hinckley, R. D. Schrimpf, D. M. Fleetwood, J. Singh, and S. T. Pantelides, "Hot-carrier degradation of AlGa_N HEMTs," 39th International Symposium on Compound Semiconductors, Santa Barbara, CA, Aug. 27-30, 2012.
- 516.E. X. Zhang, D. M. Fleetwood, S. A. Francis, C. X. Zhang, F. El-Mamouni, and R. D. Schrimpf, "Charge pumping and DCIV currents in SOI FinFETs," International Semiconductor Device Research Symposium, College Park, MD, Dec. 7-9, 2011.
- 517.R. A. Reed, R. A. Weller, M. H. Mendenhall, K. M. Warren, R. D. Schrimpf, D. M. Fleetwood, B. Sierawski, N. Dodds M. King, A. DasGupta, F. El-Mamouni, D. Black, "Applications of MRED," 8th Geant4 Space Users Workshop, Tsukuba, Japan, December 7-9, 2011.
- 518.E. X. Zhang, A. K. M. Newaz, S. Bhandaru, B. Wang, C. X. Zhang, M. L. Alles, D. M. Fleetwood, K. I. Bolotin, R. D. Schrimpf, S. T. Pantelides, S. M. Weiss, R. A. Reed, and R. A. Weller, "X-ray-induced defect formation in graphene," American Vacuum Society Symposium 58, Nashville, TN, Oct. 31-Nov. 4, 2011.
- 519.K. H. Warnick, Y. S. Puzyrev, T. Roy, D. M. Fleetwood, R. D. Schrimpf, and S. T. Pantelides, "Room-temperature native defect diffusion in semiconductors," American Vacuum Society Symposium 58, Nashville, TN, Oct. 31-Nov. 4, 2011.
- 520.S. Bhandaru, S. M. Weiss, E. X. Zhang, D. M. Fleetwood, R. A. Reed, R. A. Weller, B. R. Rogers, and R. R. Harl, "Effect of 10-keV x-rays on silicon oxidation," American Vacuum Society Symposium 58, Nashville, TN, Oct. 31-Nov. 4, 2011.
- 521.X. Shen, S. Dasgupta, R. A. Reed, R. D. Schrimpf, D. M. Fleetwood, and S. T. Pantelides, "Metastable defects and recoverable degradation in InAs/AlSb HEMTs," American Vacuum Society Symposium 58, Nashville, TN, Oct. 31-Nov. 4, 2011.
- 522.B. R. Tuttle, R. D. Schrimpf, D. M. Fleetwood, and S. T. Pantelides, "Atomic-scale physical mechanisms for reliability modeling of microelectronics," DOD High Performance Users Group Conference, Portland, OR, June 21-23.
- 523.T. Roy, E. X. Zhang, D. M. Fleetwood, R. D. Schrimpf, Y. S. Puzyrev, and S. T. Pantelides, "Reliability limiting defects in AlGa_N/Ga_N HEMTs," 2011 IEEE Intl. Reliability Physics Symposium, Monterey, CA, April 10-14, 2011.
- 524.M. L. Alles, J. L. Davidson, S. T. Pantelides, R. D. Schrimpf, D. M. Fleetwood, K. I. Bolotin, J. U. Lee, and C. D. Cress, "Radiation effects in carbon devices – It's all about the substrate," Government Microcircuit Applications and Critical Technologies Conference, Orlando, FL, March 21-24, 2011.
- 525.R. Arora, K. A. Moen, A. Madan, J. D. Cressler, E. X. Zhang, D. M. Fleetwood, R. D. Schrimpf, A. K. Sutton, and H. M. Nayfeh, "Impact of body tie and source/drain contact spacing on the hot carrier reliability of 45-nm RF-CMOS," IEEE International Integrated Reliability Workshop, pp. 56-60, 2010.
- 526.Y. Li, N. Rezzak, R. D. Schrimpf, D. M. Fleetwood, E. Zhang, Y. Wu, S. Cai, J. Wang, and D. Wang, "Including the effects of process-related variability on radiation response using a new test chip," in *10th IEEE International Conference on Solid-State and Integrated Circuit Technology (ICSICT)*, 2010, pp. 1636-1638.
- 527.M. P. King, D. Gong, C. Liu, T. Liu, A. C. Xiang, J. Ye, R. D. Schrimpf, R. A. Reed, M. L. Alles, and D. M. Fleetwood, "Response of a 0.25 μm thin-film Si-on-sapphire CMOS technology to total ionizing dose," Topical Workshop on Electronics for Particle Physics, Aachen, Germany, September 20-24, 2010.
- 528.T. Roy, E. X. Zhang, S. Dasgupta, S. A. Francis, D. M. Fleetwood, and R. D. Schrimpf, "1/f noise in GaN/AlGa_N HEMTs grown under Ga-rich, N-rich, and NH₃-rich conditions," Reliability of Compound Semiconductors Workshop, Portland, OR, May 17, 2010.
- 529.S. DasGupta, R. A. Reed, R. D. Schrimpf, D. M. Fleetwood, X. Shen, S. T. Pantelides, J. Bergman, and B. Brar, "Electrical stress induced degradation in InAs – AlSb HEMTs," Proc. Intl. Reliab. Phys. Sympos., Anaheim, CA, May 2-6, pp. 813-817 (2010).
- 530.R. A. Reed, R. A. Weller, D. M. Fleetwood, N. Dodds, M. Clemens, B. Sierawski, and A. Dasgupta, "Impact of complex material systems on the radiation response of advanced semiconductors," Government Microcircuit Applications and Critical Technologies Conference, Reno, NV, March 22-25, 2010.

- 531.E. X. Zhang, D. M. Fleetwood, M. L. Alles, R. D. Schrimpf, F. El Mamouni, W. Xiong, and S. Cristoloveanu, "Effects of fin width on memory windows in finFET ZRAMs," International Semiconductor Device Research Symposium, College Park, MD, Dec. 9-11, 2009.
- 532.H. D. Xiong, W. Wang, Q. Li, C. Richter, J. Suehle, W-K. Hong, T. Lee, and D. M. Fleetwood, "Random telegraph signals and $1/f$ noise in ZnO nanowire field effect transistors," IEEE Nano 2007, Hong Kong, August 2-5, 2007.
- 533.I. G. Batyrev, M. P. Rodgers, D. M. Fleetwood, R. D. Schrimpf, and S.T. Pantelides, "Water-molecule complexes in SiO₂ and their effect on Si-SiO₂ interface traps," Physics and Chemistry of Semiconductor Interfaces (PCSI-33), Cocoa Beach, FL, Jan. 15-19, 2006.
- 534.B. Jun, M. Fouillat, R. D. Schrimpf, D. M. Fleetwood, and S. Cristoloveanu, "Total dose radiation effects in partially-depleted SOI transistors with ultrathin gate oxide," Proceedings IEEE SOI Conference, Charleston SC, October 4-7, 2004, pp. 30-31.
- 535.X. J. Zhou, S. N. Rashkeev, L. Tsetseris, D. M. Fleetwood, R. D. Schrimpf, S. T. Pantelides, J. A. Felix, E. P. Gusev, and C. D'Emic, "Negative Bias-Temperature Instabilities in MOS Devices with SiO₂ and SiO_xN_yHfO₂ Gate Dielectrics," Electronic Materials Conference, Notre Dame, IN, June 23-25, 2004.
- 536.R. A. Weller, A. L. Sternberg, A. Kobayashi, M. H. Mendenhall, L. W. Massengill, R. D. Schrimpf, and D. M. Fleetwood, "Adaptation of GEANT4 for Single Event Simulations," presented at the Fourteenth Biennial Single Event Effects Symposium, Manhattan Beach, CA, April 2004.
- 537.B.K. Choi, W.P. Kang, J.L. Davidson, M. Howell, R.D. Schrimpf, and D.M. Fleetwood, "CVD Diamond Photoconductive Devices", DIAMOND 2003, 14th European Conference on Diamond, Diamond-like Materials, Carbon Nanotubes, Nitrides and Silicon Carbide, Salzburg Convention Centre, Salzburg, Austria, September 7-12, 2003.
- 538.J. A. Felix, H. D. Xiong, D. M. Fleetwood, E. P. Gusev, R. D. Schrimpf, A. L. Sternberg, and C. D'Emic, "Interface Trapping Properties of nMOSFETs with Al₂O₃/SiO_xN_y/Si(100) Gate Dielectric Stacks After Exposure to Ionizing Radiation," Insulating Films on Silicon Conference, Barcelona, Spain, June 18-20, 2003.
- 539.J. R. Schwank, D. M. Fleetwood, H. D. Xiong, M. R. Shaneyfelt, and B. L. Draper, "Generation of Metastable Electron Traps in the Near Interfacial Region of SOI Buried Oxides by Ion Implantation and Their Effect on Device Properties," Insulating Films on Silicon Conference, Barcelona, Spain, June 18-20, 2003.
- 540.S. N. Rashkeev, D. M. Fleetwood, R. D. Schrimpf, and S. T. Pantelides, "Atomic Scale Mechanisms of Radiation Effects in Si-SiO₂ Systems," DOD High Performance Users Group Conference, Austin, TX, June 10-14, 2002.
- 541.K. Vanheusden, D. M. Fleetwood, W. L. Warren, and R. A. B. Devine, "Reactions and Diffusion During Annealing-Induced H⁺ Generation in SOI Buried Oxides," Insulating Films on Semiconductors Conference, Kloster Banz, Germany, June 16-19, 1999.
- 542.D. M. Fleetwood, W. L. Warren, K. Vanheusden, R. A. B. Devine, M. R. Shaneyfelt, J. R. Schwank, B. L. Draper, T. L. Meisenheimer, P. S. Winokur, and M. G. Knoll, "Nonvolatile Memory Based on Mobile Protons," IEEE International Nonvolatile Memory Conference, Albuquerque, NM, June 22-24, 1998.
- 543.J. R. Schwank, M. J. Anc, M. R. Shaneyfelt, B. L. Draper, T. L. Meisenheimer, W. L. Warren, K. Vanheusden, D. M. Fleetwood, and L. P. Schanwald, "Improving ITOX Conditions for Low Defect Density and BOX Breakdown," IEEE International SOI Conf., Yosemite NP, CA, Oct. 6-9 (1997).
- 544.K. Vanheusden, W. L. Warren, W. M. Shedd, R. D. Pugh, D. M. Fleetwood, J. R. Schwank, and R. A. B. Devine, "Characterization of Interface Traps in SOI Material," IEEE International SOI Conference, Yosemite NP, CA, Oct. 6-9 (1997).
- 545.K. Vanheusden, J. R. Schwank, W. L. Warren, D. M. Fleetwood, and R. A. B. Devine, "Radiation Induced H⁺ Trapping in Buried SiO₂," Insulating Films on Semiconductors (INFOS) Conference, Goteborg, Sweden, June 11-14 (1997).
- 546.A. N. Campbell, K. A. Peterson, D. M. Fleetwood, and J. M. Soden, "Effects of Focused Ion Beam Irradiation on MOS Transistors," International Reliability Physics Symposium, Denver, CO, April 7-10, 1997.
- 547.S. L. Kosier, R. D. Schrimpf, A. Wei, M. DeLaus, D. M. Fleetwood, and W. E. Combs, "Effects of Oxide Charge and Surface Recombination Velocity on the Excess Base Current of BJTs," IEEE Bipolar Circuits and Devices Conference, Minneapolis, MN Oct. 6-8, 1993.
- 548.W. L. Warren, D. M. Fleetwood, J. R. Schwank, M. R. Shaneyfelt, P. S. Winokur, R. A. B. Devine, W. P. Maszara, and J. B. McKitterick, "Shallow Oxygen-Related Donors in Bonded and Etchback SOI Substrates," IEEE International SOI Conference, Palm Springs, CA, Oct. 5-7, 1993.
- 549.J. H. Scofield, N. Borland, and D. M. Fleetwood, "Random Telegraph Signals in Small Gate-Area p-MOS Transistors," Noise in Physical Systems, St. Louis, MO, August 15-20, 1993.

550. W. L. Warren, J. R. Schwank, M. R. Shaneyfelt, D. M. Fleetwood, and P. S. Winokur, "Radiation Induced Defect Centers in Bonded and Etchback SOI Materials," Insulating Films on Semiconductors (INFOS) Conference, Delft, The Netherlands, June 2-5 (1993).
551. P. S. Winokur and D. M. Fleetwood, "Total Dose Radiation Hardness Assurance for Space Electronics," 8th Symposium on Space Nuclear Power Systems, Albuquerque, NM, Jan. 7-10, 1991.
552. F. W. Sexton, P. S. Winokur, D. M. Fleetwood, M. R. Shaneyfelt, M. D. Terry, and R. V. Jones, "Test Structures for a QML Approach to Radiation Hardness Assurance," Workshop on Test Structures for Semiconductor Device Radiation Hardening and Hardness Assurance, Los Angeles, CA, April 26, 1990, pp. 261-84.
553. J. R. Schwank, F. W. Sexton, D. M. Fleetwood, M. S. Rodgers, and K. L. Hughes, "The Response of Metal-Oxide-Semiconductor Devices Irradiated at High Temperatures," 6th Symposium on Space Nuclear Power Systems, Albuquerque, New Mexico, Jan. 9-12, 1989.
554. D. M. Fleetwood and S. S. Tsao, "Silicon-on-Insulator Electronics for a Space Nuclear Power System," 5th Symposium on Space Nuclear Power Systems, Albuquerque, NM, Jan. 11-14, 1988.
555. S. S. Tsao, D. M. Fleetwood, L. Pfeiffer, G. K. Celler, V. Kaushik, B. Cowden, and A. K. Datye, "Island-Edge Effects in MOS/SOI Transistors," SOS/SOI Workshop, Durango, CO, Oct. 6-8, 1987, pp. 33-34.
556. D. M. Fleetwood, "Reevaluating the Worst-Case Post-Irradiation Response of MOS Transistors," in Proceedings of the 1987 VHSIC/VLSI Qualifications, Reliability, and Logistics Workshop, Colorado Springs, Aug. 1987, prepared by Palisades Institute for Research Services, Inc., New York, 1987, pp. 293-302.
557. D. M. Fleetwood and P. V. Dressendorfer, "The Effect of Elevated Temperature on Irradiated Metal-Oxide-Semiconductor (MOS) Devices," 4th Symposium on Space Nuclear Power Systems, Albuquerque, NM, Jan. 12-15, 1987.
558. J. R. Schwank, P. S. Winokur, P. V. Dressendorfer, and D. M. Fleetwood, "Performance of Polysilicon Gate CMOS Devices in Space and SDI Environments," Space Electronics Conference, Albuquerque, NM, Sept. 9-11, 1986.
559. D. M. Fleetwood and N. Giordano, " $1/f$ Noise in Metal Films: Resistivity Dependence and Sample-to-Sample Variations," Noise in Physical Systems, Montpellier, France, May 1983.

External Seminars

560. D. M. Fleetwood, "Moore's law and radiation effects," IEEE NPSS Distinguished Lecture, Oakland/East Bay Chapter of the IEEE NPSS, November 16, 2017.
561. D. M. Fleetwood, "Basic mechanisms of radiation effects," National University of Defense Technology, Changsha, China, Sept. 4, 2017.
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566. D. M. Fleetwood, "Moore's law and radiation effects," Iowa State University, Distinguished Lecture, ECE Department, Ames, IA, Oct. 7, 2016.
567. E. X. Zhang, C. Liang, C. X. Zhang, D. M. Fleetwood, R. D. Schrimpf, M. L. Alles, R. A. Reed, K. Bolotin, and S. T. Pantelides, "Radiation effects in 2D materials and devices," University of Memphis, Physics Dept. Colloquium, Oct. 7, 2016.
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- 573.D. M. Fleetwood, "Moore's law and radiation effects," Boston University, Distinguished Lecture, ECE Department, Boston, MA, Sept. 30, 2015.
- 574.R. D. Schrimpf, W. G. Bennett, S. L. Weeden-Wright, M. L. Alles, R. A. Reed, D. M. Fleetwood, E. X. Zhang, D. Linten, M. Jurzak, R. DeGraeve, and A. Fantini, "Reliability issues for RRAM in radiation environments," presented at 5th International Stanford/imec RRAM Workshop, Leuven, Belgium, September 24, 2015.
- 575.D. M. Fleetwood, "Energies and microstructures of defects contributing to $1/f$ noise in microelectronic materials and devices," Harbin Institute of Technology, Harbin, China, June 5, 2015.
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- 579.R. D. Schrimpf and D. M. Fleetwood, "Radiation effects in devices and ICs: BJT gain degradation and single-event effects," Harbin Institute of Technology, Harbin, China, May 7, 2014.
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- 582.R. D. Schrimpf D. M. Fleetwood, R. A. Reed, and S. T. Pantelides, "Deeming GaN space-worthy," Air Force Research Laboratory, Albuquerque, NM, Dec. 13, 2013.
- 583.D. M. Fleetwood and R. D. Schrimpf, "Radiation effects and reliability of micro- and nano-electronics," Sandia National Laboratories, Albuquerque, NM, Dec. 12, 2013.
- 584.R. A. Reed, R. A. Weller, R. D. Schrimpf, M. Alles, B. Sierawski, M. King, F. El-Mamouni, I. Samsel, D. M. Fleetwood, M. H. Mendenhall "Radiation-induced soft errors in advanced electronic devices," Columbia University, New York, NY, Sept. 10, 2013.
- 585.D. M. Fleetwood and R. D. Schrimpf, "Hardness assurance testing of MOS and linear bipolar devices and ICs."
(a) Harbin Institute of Technology, Harbin, China, June 19, 2013.
(b) Xinjiang Institute of Physics and Chemistry, Urumqi, China, June 17, 2013.
- 586.R. D. Schrimpf, M. L. Alles, F. El-Mamouni, D. M. Fleetwood, E. X. Zhang, and R. A. Reed, "Ultimate CMOS scaling and associated radiation reliability problems."
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- 601.X. J. Zhou and D. M. Fleetwood, "Effects of aging on MOS low frequency noise," National Semiconductor, Santa Clara, CA, August 23, 2007.
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- 606.D. M. Fleetwood, "The Protonic Nonvolatile Memory," Sandia National Laboratories, Physics and Chemistry Colloquium Series, June 16, 1999; and Vanderbilt University, ECE Dept. Seminar, April 7, 1999.
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- 608.D. M. Fleetwood, "Mobile Protons and Thermally Stimulated Current in the Si/SiO₂ System," Ohio State University Physics Dept. Seminar, Sept. 22, 1998.
- 609.D. M. Fleetwood, "The MOS Gate Oxide," University of New Mexico Microelectronics Reliability Lecture Series, Albuquerque, NM, February 10, 1998.
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- 612.D. M. Fleetwood, "Border Traps in MOS Devices," Materials Science & Engineering Dept. Seminar, Lehigh U., Bethlehem PA, Feb. 19, 1997; and Physical Sciences Seminar, AT&T Bell Laboratories, Murray Hill, NJ, October 10, 1995.
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- 615.D. M. Fleetwood, "1/f Noise and Defects in MOS Transistors: Links to Radiation-Induced Trapped Charge," Vanderbilt University, Nashville, TN, March 15, 1991; Lehigh University, Bethlehem, PA, September 27, 1990.
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