

JAMES A. BAIN

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412-268-3602, jbain@ece.cmu.edu, <http://www.jamesabain-cmu.org/~jbain/>**EDUCATION AND EMPLOYMENT HISTORY**

EDUCATION	
June 1993	PhD Materials Science & Engineering, Stanford University, Stanford, CA. Thesis: <i>Structural Characterization of Thin Metallic Films and Multilayers Using X-ray Diffraction</i> Advisor: Professor Bruce M. Clemens
June 1991	M.S. Materials Science & Engineering, Stanford University, Stanford, CA.
June 1988	B.S. Materials Science & Engineering, University of Pennsylvania, PA

EMPLOYMENT	
7/05 - Present	Professor with Tenure, Electrical and Computer Engineering, Carnegie Mellon University, Pittsburgh, PA
4/05 - Present	Associate Director, Electrical and Computer Engineering, Data Storage Systems Center, Carnegie Mellon University, Pittsburgh, PA
7/02 - 7/05	Associate Professor, Carnegie Mellon University, Pittsburgh, PA
7/01 - 7/02	Senior Research Scientist, Carnegie Mellon University, Pittsburgh, PA
7/95 - 6/01	Research Scientist, Carnegie Mellon University, Pittsburgh, PA
5/93 - 7/95	Postdoctoral Research Associate, Carnegie Mellon University, Pittsburgh, PA
9/88 - 5/93	Research Assistant, Stanford University, Stanford, CA
5/88 - 6/88	Product Support Engineer, Advanced Drivetrain Co., Jamestown, NY
6/87 - 6/88	Undergraduate Researcher, The University of Pennsylvania, Philadelphia, PA

RESEARCH INTERESTS	
Thin Film Materials	Electronic/Magnetic Device Fabrication
Nanoscale Energy Delivery	Electronic/Magnetic Device Physics

ACHIEVEMENTS AT A GLANCE
23 Graduated PhD Advisees (in 4 different departments, with 10 different co-advisors)
150 Archival Journal Articles; 100 Conference Publications; ~100 Invited Talks (not listed)
\$4.4 M in funding as PI; \$40 M in funding as Co-PI
Courses Taught: 13 Unique Courses; 40 Semesters; 500 Students
IEEE Senior Member

TEACHING, ADVISING AND PROJECT SUPERVISION

COURSES TAUGHT
1. Applied Electrodynamics (ECE 18-402), Carnegie Mellon University S' 16, S'15, S'14, S'13, S'12, S'11, S'10
2. Fundamentals of Electromagnetics (ECE 18-300), Carnegie Mellon University, F'15, F'14, F'13, F'12, F'09, F'08.
3. Electronic Devices and Analog Circuits (ECE 18-220), Carnegie Mellon University, F'16
4. Memory Devices and Systems (ECE18-617), Carnegie Mellon University, F'11, S'10, S'09.
5. Information Storage Devices and Systems (18-616), Carnegie Mellon University, F'10.
6. Data Storage Systems Design (ECE 18-517), Carnegie Mellon University, S'08, S'07, S'05, S'04, S'03, S'02, S'00, S'99.
7. Data Storage Systems (ECE-18-416), Carnegie Mellon University, F'07, F'06, F'05.
8. Spec. Topics in Appl. Phys: Micro & Nanofabrication (ECE 18-819C), Carnegie Mellon University, S'06.
9. Mathematical Foundations of Electrical Engineering (ECE-18-202), Carnegie Mellon University, F'04, F'03, F'02.
10. Physics of Applied Magnetism (ECE 18-715), Carnegie Mellon University, F'01.
11. Electrical, Magnetic and Optical Properties of Materials, (MSE 27-770), Carnegie Mellon University, S'01.
12. Introduction to Data Storage (ECE 18-316), Carnegie Mellon University, F'00, F'98, S'98, S'95.
13. Laboratory Methods in Data Storage Research (CIT 39-717), Carnegie Mellon University, F'99, F'98.
14. Processes for Microfabrication (ECE 18-819), Carnegie Mellon University, F'97.

CURRENT PHD STUDENTS (THESIS ADVISOR)	
Name	Dissertation Topic (Started, Expected Graduation)
1. Hongliang Liang (co-advised w/ Schlesinger)	HAMR Laser Integration (09/2013-05/2018)
2. Cheng-Ming Chow	HAMR Near Field Transducers (06/2013-05/2018)
3. Nabil El-Hinnawy (co-advised w/ Paramesh)	GeTe-based Inline Phase-Change Switches for RF Switching Applications (09/2014-06/2017)
4. Darshil Gala	??

POSTDOCTORAL PROJECT SUPERVISION (RESEARCH ADVISOR)	
Name	Date and Subsequent Position (as Available)
1. Joshua Smith	2013, Hired by Army Research Labs
2. Joseph Pichon	2008-2009
3. Dragos Mircea	2007-2009, Hired by HGST
4. Hwansoo Lee	2004-2007
5. Changmin Park	2003, Hired by Intel
6. Chen Chen	2001-2003
7. Gwan Soo Park	1997-1998, Returned to Korean Maritime University

GRADUATED PHD STUDENTS (THESIS ADVISOR)			
Name	Co-Advisor:	Year	Thesis Title
1. Min Xu	N/A	2017	Study of the Crystallization Dynamics and Threshold Voltage of Phase Change Materials for Use in Reconfigurable RF Switches and Non-volatile Memories
2. Abhishek Sharma	Weldon	2016	S-type Negative Differential Resistance: Memory and Oscillators for Next-Generation Computation
3. Gregory Slovin	Schlesinger	2016	Four-Terminal RF Phase Change Switches: Design, Optimization and Fabrication
4. Hai Li	Zhu	2016	Heat Assisted Magnetic Recording (HAMR)
5. Yongjune Kim	Kumar	2016	Error Control Coding for (Flash) Memories
6. Stephan Piotrowski	Majetich	2016	Conductive AFM of Magnetic Nanostructures
7. Weihua Hu (Phys)	Ricketts	2012	Tip Based Nanofabrication Using Multi-mode Scanning Probe Microscopy
8. Matthew Chabalko	Stancil	2012	Heat assisted magnetic recording near field transducer analysis and design
9. Mohammad Noman	Schlesinger	2012	Investigation of electroforming characteristics of TiO ₂ based resistance switching devices
10. Jiacheng Huang	Schlesinger	2012	Phase change materials on metals: crystallization behavior and applications in magnetic stacks
11. Eng Keong Chua	Schlesinger	2011	Development of Phase Change Switches with Low Resistance in the "ON state"
12. Chun Chia Tan	Schlesinger	2011	Nitrogen-doped Ge ₂ Sb ₂ Te ₅ based Superlattice-like Structures for Phase Change Random Access Memory
13. Eric Black	Schlesinger	2010	Optical path integration in heat assisted magnetic recording
14. Hsin-Yi (Katey) Lo (MechE)	N/A	2009	Probe Reconfigurable Phase Change Material Switches
15. Brian Knight	Schlesinger	2009	Adjacent track aging in heat assisted magnetic recording
16. Lifu Zhou	Schlesinger	2007	Planar optical devices for light concentration in heat assisted magnetic recording head
17. Ahmet Kaya (Phys)	N/A	2007	Experimental measurements of the magnetic recording head high frequency response and comparison to quantitative models
18. Winnie Yu	N/A	2005	Magnetic domain structure control in patterned FeCo thin films using intrinsic and externally applied stresses
19. Li Zhang (Phys)	Zhu	2005	Characterization of heat-assisted magnetic probe recording on CoNi/Pt multilayers
20. Shingo Tamaru	Kryder	2005	Study of magnetostatic mode waves using scanning Kerr imaging /
21. Hwansoo Lee (MSE)	Laughlin	2004	Sputtered magnetic tape media fabrication and recording performance
22. Seungook Min (MSE)	Greve	2003	Materials issues in the integration of magnetic structures on CMOS-MEMS
23. Jason Wolfson	N/A	2002	Kerr imaging of soft magnetic transducer films for measuring head fields

24. Fabian (Chih-Ling) Lee (MSE)	McHenry	2002	Biasing of spin filter spin valve for magnetic read head
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GRADUATED PHD STUDENTS (THESIS ADVISOR) (CONT'D)			
Name	Co-Advisor:	Year	Thesis Title
25. Faith Sarigoz	Bhagavatula	2002	Characterization and mitigation of dropouts in magnetic tape recording : a read channel perspective
26. Pei Zou	N/A	2002	Using high moment FeXN thin films in recording head poles: materials, design, fabrication and characterization
27. Changmin Park	N/A	2001	Focused-Ion-Beam Processing of Magnetic Materials for Magnetic Recording Heads

GRADUATED M.S. STUDENTS (PROJECT ADVISOR)			
Name	Co-Advisor	Year	Project Title
1. Vickie Guo		2002	
2. Winnie Yu		2001	
3. Shingo Tamaru	Kryder	1999	
4. Ming Ni		1999	
5. Mehmet Keskinöz	Bhagavatula	1997	

UNDERGRADUATE STUDENTS (PROJECT ADVISOR)			
Name	Co-Advisor	Year	Home Institution
1. David Bromberg		Spr. 2010	Carnegie Mellon University
2. Amal El-Ghazaly	Messner	Spr. 2010	Carnegie Mellon University
3. Chen Song		Spr. 2009	Carnegie Mellon University
4. Daniel Mirkovic		Fall 2008	Carnegie Mellon University
5. Matthew Salac	Messner	Spr. 2008	Carnegie Mellon University
6. Alice Li		Sum 2007	Carnegie Mellon University
7. Nikhil Mallavarapu		Fall 2006, Spr. 2007	Carnegie Mellon University
8. Hiram Vasquez	Hoburg	Spring 2006	Carnegie Mellon University
9. Jim Salvia	Yue Hoburg	Spr. 2005 Spring/Fall 2004 Spr. 2003	Carnegie Mellon University
10. Olivia Tsai	Hoburg	Sum. 2003	Carnegie Mellon University
11. Kevin Roark		Sum. 2000	Brown University (Chem E)
12. Kurt Edmiston		Sum. 1999	Alfred Univ. (Math & CS)
13. Michael Scott		Fall 1999	Carnegie Mellon University
14. J.P. van't Hof		Sum. 1999, Spr. 2000	Carnegie Mellon University
15. Winnie Yu		Fall 1998, Spr. 1999	Carnegie Mellon University
16. Kelly Pellerin		Fall 1998, Spr. 1999	Carnegie Mellon University
17. Jonanthan Gimbel		Summer 1998	Penn State (Mech E)
18. Rahul Mangharam		Spring 1998	Carnegie Mellon University
19. Keith Rothschild		Sum. 1997	Carnegie Mellon University
20. Jason Chow		Sum 1997	Carnegie Mellon University
21. Anthony Boccio		Sum. 1997	Univ. of Rochester
22. Eli Depalma		Sum. 1996	Univ. of Santa Cruz
23. Sidney Laurenceau		Summer 1996	Univ. of Rochester
24. Tonya Galgon	Spratt	Summer 1995	Univ. of Rochester
25. Joseph Yu		Summer 1995	UT Austin

RESEARCH OUTPUT AND FUNDING

BOOKS AND BOOK CHAPTERS	
1.	J. F. Hoburg and J. A. Bain , "Susceptibility of Magnetic Information Storage to Power Frequency Magnetic Fields" <i>Electric Power Research Institute (EPRI) Report No. 1008154</i> (2003) 110 pgs.
2.	J. A. Bain , "The Manufacture of Inductive and Magnetoresistive Heads," in <i>The Encyclopedia of Materials Science and Technology</i> , Elsevier Science Ltd., Ed. by K. H. J. Buschow, R. W. Cahn, M. C. Flemings, B. Ilschner, E. J. Kramer and S. Mahajan. pp 4868-4879 (2001)
ARCHIVAL PAPERS (PEER-REVIEWED)	
1.	Kim, Y., Sharma, A.A., Mateescu, R., Song, S-H., Bandic, Z., Bain, J.A. , Vijaya Kumar, V.B., "Locally Rewritable Codes for Resistive Memories", <i>IEEE Journal on Selected Areas in Communications, Institute of Electrical and Electronics Engineers (IEEE)</i> , vol. 34, no. 9, September 2016
2.	Li, D., Sharma, A.A., Gala, D.K., Shukla, N., Paik, H., Datta, S., Schlom, D.G., Bain, J.A. , Skowronski, M., "Joule Heating-Induced Metal-Insulator Transition in Epitaxial VO ₂ /TiO ₂ Devices," <i>ACS Applied Materials & Interfaces, American Chemical Society (ACS)</i> , Vol. 8, no. 20, pp. 12908-126914, May 2016
3.	Slovin, G. Bain, J.A. , Schlesinger, T.E., Paramesh, J., "AlN Barriers for Capacitance Reduction in Phase-Change RF Switches", <i>IEEE Electron Device Letters</i> , Vol. 37, no. 5, pp. 568-571, May 2016
4.	Xu, M., Slovin, G., Bain, J.A. , Schlesinger, T.E., Paramesh, J., "Measurement of Phase Change Switch Critical Quench Time and Crystallization Time", <i>IEEE Electron Device Letters</i> , February, 2016
5.	Gala, D., Sharma, A.A., Li, D., Goodwill, J., Bain, J.A. , Skowronski, M., "Low temperature electroformation of TaOx-based resistive switching devices", <i>Applied Physics Letters</i> , vol. 4, pp. 016101, January, 2016
6.	Jeong, M., Freedman, J., Liang, H., Chow, C-M., Sokalski, V., Bain, J.A. , Malen, J. "Enhancement of Thermal Conductance at Metal-Dielectric Interfaces Using Subnanometer Metal Adhesion Layers" <i>Physical Review</i> , vol. 5, January 2016
7.	Sharma, A.A.; Bain, J.A. ; Weldon, J.A. "Phase Coupling and Control of Oxide-Based Oscillators for Neuromorphic Computing", <i>Exploratory Solid-State Computational Devices and Circuits, IEEE Journal on</i> , On page(s): 58 - 66 Volume: 1, Dec. 2015
8.	Sharma, A.A.; Yunlu Li; Skowronski, M.; Bain, J.A. ; Weldon, J.A. "High-Frequency TaOx-Based Compact Oscillators", <i>Electron Devices, IEEE Transactions on</i> , On page(s): 3857 - 3862 Vol. 62, no. 11, Nov. 2015
9.	Yalon, E., Sharma, A.A., Skowronski, M. ; Bain, J.A. , Ritter, D., Karpov, I.V. "Thermometry of Filamentary RRAM Devices," <i>IEEE Transactions on Electron Device</i> , vol. 63, no. 9, pp. 2972 – 2977 July 2015.
10.	Jackson, T., Sharma, A.A., Weldon, J., Bain, J.A. , Pileggi, L., "Oscillatory Neural Networks based on TMO Nano-Oscillators and Multi-Level RRAM Cells". <i>IEEE Journal On Emerging And Selected Topics In Circuits And Systems</i> . vol. 5, no. 2, pp. 230-241, June 2015.
11.	Sharma, A.A., Karpov, I., Kotlyar, R., Kwon, J., Skowronski, M., Bain, J.A. , "Temporal Dynamics of Electroforming in Binary Metal Oxide-based Resistive Switching Memory". <i>Journal of Applied Physics</i> , 118, 114903, 2015.
12.	Kwon, J., Sharma, A.A., Bain, J.A. , Picard, Y.N., Skowronski, M., "Oxygen Vacancy Creation, Drift, and Aggregation in TiO ₂ -Based Resistive Switches at Low Temperature and Voltage". <i>Advanced Functional Materials</i> , vol. 25, no. 19, pp. 2876-2883, May 2015.
13.	Sharma, A.A., Li, Y., Skowronski, M., Bain, J.A. , Weldon, J.A. "High-Performance Oxide-based Compact Oscillators: Ballast and Filament Dynamics". <i>IEEE Transactions on Electron Devices</i> . Submitted March 2015.
14.	Xu, M., Slovin, G., Bain, J.A. , Schlesinger, T.E., Paramesh, J., "Design and Thermometry of a High Temperature High Speed Micro Heater," <i>Review of Scientific Instruments</i> , Submitted February 2015

15. Kamaladasa, R.J., Sharma, A.A., Lai, Y.-T., Chen, W., Salvador, P., Bain, J.A. , Skowronski, M., Picard, Y., "In situ TEM imaging of defect dynamics under electrical bias in resistive switching rutile-TiO ₂ ," <i>Microscopy and Microanalysis</i> , vol. 21, no. 1, pp. 140-153, February 2015.
16. Ozcan, O. Weihua, H., Sitti, M., Bain, J. , Ricketts, D.S., "Investigation of tip current and normal force measured simultaneously during local oxidation of titanium using dual-mode scanning probe microscopy". <i>Micro & Nano Letters</i> , vol. 9, no. , p. 332-336, May 2014
17. Sharma, A.A., Noman, M., AbdElmoula, M., Skowronski, M., Bain, J.A. , "Electronic Instabilities Leading to Electroformation of Binary Metal Oxide-based Resistive Switches," <i>Advanced Functional Materials</i> , vol. 24, pp. 5522, 2014
18. Noman, M., Sharma, A.A., Lu, Y. Kamaladasa, R., Skowronski, M., Salvador, M., Bain, J.A. , "Mechanism of localized electrical conduction at the onset of electroforming in TiO ₂ based resistive switching devices," <i>Applied Physics Letters</i> , vol. 104, pp. 113510:1-5, 2014
19. Lu, Y.M., Noman, M., Picard, Y., Bain, J.A. , Salvador, P., Skowronski, M., "Impact of Joule heating on the microstructure of nanoscale TiO ₂ resistive switching devices," <i>Journal of Applied Physics</i> , vol. 113, no. 16, pp. 163703, 2013
20. Hogg, C.R., Natasimhan, A., Bain, J.A. , Majetich, S.A., "Pattern transfer with stabilized nanoparticle etch masks," <i>Nanotechnology</i> , vol. 24, no. 8, pp. 085303, 2013
21. Huang, J.C., Song, W.D., Bain, J.A. , Yang, Y., Shi, L.P, Schlesinger, T.E., Chong, T.C., Hui, H.K., "Magnetoresistance in granular films formed by CoFe and phase change material," <i>Applied Physics A: Materials Science & Processing</i> , vol. 113, no. 1, pp. 221-9, October 2013
22. Ho. H., Sharma, A.A., Ong, W-L., Malen, J.A., Bain, J.A. , Zhu, J. "Experimental estimates of in-plane thermal conductivity in FePt-C granular thin film heat assisted magnetic recording media using a model layered system," <i>Applied Physics Letters</i> , vol. 103, no. 13, pp. 131907-131907-4, Septemeber 2013
23. Tan, C.C., Shi, L., Zhao, R., Guo, Q., Li, Y., Yang, Y., Chong, T.C., Malen, J.A., Ong, W-L., Schlesinger, T.E., Bain, J.A. , "Compositionally matched nitrogen-doped Ge ₂ Sb ₂ Te ₅ /Ge ₂ Sb ₂ Te ₅ superlattice-like structures for phase change random access memory," <i>Applied Physics Letters</i> , vol. 103, no. 13, pp133507 (5 pp.), Septemeber 2013
24. Quirk, E.B., Gamble, A., Hussin, R., Slovin, G., Kong, Y., Schlesinger, T.E., Bain, J.A. , Kuriyama, K., Luo, Y., "A Process for Transferring and Patterning InAs Quantum Dot Optical Gain Media for HAMR Near Field Optical Sources," <i>Magnetics, IEEE Transactions on on</i> , vol. 49, no. 7, pp. 3564-3567 July 2013
25. Kuriyama, K., Chabalko, M.J., Kong, Y., Luo, Y., Schlesinger, T.E., Bain, J.A. , "Modeling of Polarization Effects in Au nanodots excited with InAs quantum dot emitters for use as a HAMR heat source," <i>Magnetics, IEEE Transactions on on</i> , vol. 49, no. 7, pp. 3560-356 July 2013
26. Wen, C.Y., Slovin, G., Bain, J.A. , Schlesinger, T.E., Pileggi, L., Paramesh, J., "A Phase-Change Via-Reconfigurable CMOS LC VCO, <i>IEEE Transactions on Electron Devices</i> , vol. 60, no. 12, pp. 3979-88. December 2013
27. Huang, J.C., Bain. J.A., Song, W.D., Li, M.H., Shi, L.P, Schlesinger, T.E., Chong, T.C, "Assessing diffusion barriers for phase change memory devices using the magnetization of Fe," <i>Applied Physics Letters</i> , vol. 102, no. 25, pp. 254102-254102-4, June 2013
28. Kamaladasa, R.J., Lu, Y.M., Salvador, P., Bain, J.A. , Skowronski, M., Picard, Y., "Dislocation impact on resistive switching in single-crystal SrTiO ₃ ," <i>Journal of Applied Physics</i> , vol. 113, no. 23, pp. 234510-234510-7, June 2013.
29. Hogg, C.R., Picard, Y., Narasimhan, A., Bain, J.A. , Majetich, S.A., "Pattern transfer with stabilized nanoparticle etch masks," <i>Nanotechnology</i> , vol. 24, no. 8, pp085303-085313, March 2013
30. Noman, M., Sharma, A.A., Lu, Y.M., Skowronski, M., Salvador, P., Bain, J.A. , "Transient characterization of the electroforming process in TiO ₂ based resistive switching devices," <i>Applied Physics</i> , vol.102, no. 2, pp. 023507–023507–4, January 2013.
31. Lu, Y.M., Noman, M., Chen, W., Salvador, P., Bain, J.A. , Skowronski, M., "Elimination of high transient currents and electrode damage during electroformation of TiO ₂ -based resistive switching devices," <i>Journal of Physics D-applied Physics</i> , vol. 45, no. 39, pp395101-395106, October 2012.

32. Kamaladasa, R.J., Noman, M., Yi, L.M., Bain, J.A. , Salvador, P., De Graef, M.J., Skowronski, M., Picard, Y., "Dislocation analysis in metal-oxide materials and devices by electron channeling contrast imaging," <i>Microscopy and Microanalysis</i> , vol. 18(S2), pp. 706-707, August 2012.
33. Chua, E.K., Zhao, R., Shi, L.P., Chong, T.C., Schlesinger, T.E., Bain, J.A. , "Effect of metals and annealing on specific contact resistivity of GeTe/metal contacts," <i>Applied Physics Letters</i> , vol. 101, no. 1, pp. 012107–012107–4, July 2012
34. Hu, W., Bain, J.A. , Ricketts, D., "In situ quantification of electrical isolation in STM-fabricated TiOx nanostructures," <i>Micro & Nano Letters</i> , vol. 7, no. 4, pp334-336, April 2012.
35. Huang, J. C., Song, W. D., Shi, L. P., Zhao, R., Chong, T. C., Bain, J. A. , & Schlesinger, T. E. (2011). Crystallinity and its influence on physical and magnetic properties in phase change magnetic materials. <i>Non-Volatile Memory Technology Symposium (NVMTS)</i> , 2011 11th Annual (7-9 Nov. 2011), 1-4.
36. Evarts, E., Booth, R., Shah, L. R., Tang, Y., Tamaru, S., Ricketts, D., Bain, J. A. , & Majetich, S. (2011). Sub-30 nm Magnetic Tunnel Junction and Spin Valve Nanopillar Analysis Using Conductive Atomic Force Microscopy. <i>Intermag: International Magnetism Conference</i> . paper BB-03, Taiwan, April 2011.
37. Kong, Y., Chabalko, M., Black, E., Powell, S., Bain, J. A. , Schlesinger, T. E., & Luo, Y. "Evanescent Coupling Between Dielectric and Plasmonic Waveguides for HAMR Applications". <i>Magnetics, IEEE Transactions on</i> , 47(10), 2364-2367, October 2011.
38. Lin, W.-C., Zhu, J.-G., Moneck, M. T., Okada, T., Fujimori, J., Kasuya, T., Katsumura, M., Iada, T., Kuriyama, K., Sokalski, V., Powell, S. P., & Bain, J. A. "Fabrication and Recording of Bit Patterned Media Prepared by Rotary Stage Electron Beam Lithography". <i>Magnetics, IEEE Transactions on</i> , 47(10), 2656-2659, October 2011.
39. Jiang, W., Kamaladasa, R. J., Lu, Y. M., Vicari, A., Berechman, R., Salvador, P., Bain, J. A. , Picard, Y. N., & Skowronski, M. "Local heating-induced plastic deformation in resistive switching devices". <i>Journal of Applied Physics</i> , 110(5), 054514-054514-6, September 2011.
40. S. Tamaru, J. A. Bain , M. H. Kryder, and D. S. Ricketts, "Green's function for magnetostatic surface waves and its application to the study of diffraction patterns," <i>Physical Review B (Condensed Matter and Materials Physics)</i> , vol. 84, no. 6, p. 064437 (14 pp.), August 2011.
41. Jiang, W., Noman, M., Lu, Y. M., Bain, J. A. , Salvador, P., & Skowronski, M. "Mobility of oxygen vacancy in SrTiO3 and its implications for oxygen-migration-based resistance switching". <i>Journal of Applied Physics</i> , 110(3), 034509-034509-8, August 2011.
42. Chua, E. K., Shi, L. P., Li, M. H., Zhao, R., Chong, T. C., Schlesinger, T. E., & Bain, J. A. "Band alignment between GeTe and SiO2/metals for characterization of junctions in nonvolatile resistance change elements". <i>Applied Physics Letters</i> , 98, 232104, June 2011.
43. Yi Meng Lu, Wenkan Jiang, M. Noman, J. A. Bain , P. A. Salvador, and M. Skowronski, "Thermographic Analysis of Localized Conductive Channels in Bipolar Resistive Switching Devices," <i>Journal of Physics D: Applied Physics</i> , vol. 44, no. 18, p. 185103 (6 pp.), May 2011.
44. Bain, J. A. , Bhagavatula, V., Cai, Y., Jeon, S., Mai, K. W., Messner, W. C., Sim, C. H., Wang, Y., & Zhu, J.-G. "Extendibility of traditional perpendicular magnetic recording for hard disk drives". <i>Journal of Applied Physics</i> , 109(7), 07B774 - 07B774-3, April 2011.
45. Powell, S. P., Black, E. J., Schlesinger, T. E., & Bain, J. A. , "The influence of media optical properties on the efficiency of optical power delivery for heat assisted magnetic recording". <i>Journal of Applied Physics</i> , 109(7), 07B775-07B775-3, April 2011.
46. M. Noman, Wenkan Jiang, P. A. Salvador, M. Skowronski, and J. A. Bain , "Computational investigations into the operating window for memristive devices based on homogeneous ionic motion," <i>Applied Physics A: Materials Science & Processing</i> , vol. 102, no. 4, pp. 877-83, Mar. 2011.
47. Ricketts, D.S.; Bain, J.A. ; Yi Luo; Blanton, R.D.; Mai, K.; Fedder, G.K.; , "Enhancing CMOS Using Nanoelectronic Devices: A Perspective on Hybrid Integrated Systems," <i>Proceedings of the IEEE</i> , vol.98, no.12, pp.2061-2075, Dec. 2010
48. Chua, E. K.; Shi, L. P.; Zhao, R.; Lim, K. G.; Chong, T. C.; Schlesinger, T. E.; Bain, J. A. ; , "Low resistance, high dynamic range reconfigurable phase change switch for radio frequency applications," <i>Applied Physics Letters</i> , vol.97, no.18, pp.183506-183506-3, Nov 2010

49. Evarts, E.R.; Limin Cao; Ricketts, D.S.; Rizzo, N.D.; Bain, J.A. ; Majetich, S.A.; , "Characterization of Conducting Atomic Force Microscopy for Use With Magnetic Tunnel Junctions," <i>Magnetics, IEEE Transactions on</i> , vol.46, no.6, pp.1741-1744, June 2010
50. Hogg, C.R.; Majetich, S.A.; Bain, J.A. ; , "Investigating Pattern Transfer in the Small-Gap Regime Using Electron-Beam Stabilized Nanoparticle Array Etch Masks," <i>Magnetics, IEEE Transactions on</i> , vol.46, no.6, pp.2307-2310, June 2010
51. Knight, B.R.; Bain, J.A. ; Schlesinger, T.E.; , "HAMR Adjacent Track Stability in the Presence of a Medium Curie Temperature Distribution," <i>Magnetics, IEEE Transactions on</i> , vol.46, no.6, pp.2462-2465, June 2010
52. Jiang, W.; Evans, D.; Bain, J. A. ; Skowronski, M.; Salvador, P. A.; , "Electron beam induced current investigations of Pt/SrTiO _{3-x} interface exposed to chemical and electrical stresses," <i>Applied Physics Letters</i> , vol.96, no.9, pp.092102-092102-3, Mar 2010
53. Suzuki, H.; Messner, W. C.; Bain, J. A. ; Bhagavatula, V.; Nabavi, S.; "Simultaneous PES Generation, Timing Recovery, and Multi-Track Read on Patterned Media: Concept and Performance," <i>Magnetics, IEEE Transactions on</i> , vol.46, no.3, pp.825-829, March 2010.
54. Hsinyi Lo; Engkeong Chua; Jian Cheng Huang; Chun Chia Tan; Cheng-Yuan Wen; Rong Zhao; Luping Shi; Chong Tow Chong; Paramesh, J.; Schlesinger, T.E.; Bain, J.A. ; , "Three-Terminal Probe Reconfigurable Phase-Change Material Switches," <i>Electron Devices, IEEE Transactions on</i> , vol.57, no.1, pp.312-320, Jan. 2010
55. B. Knight, J. Bain , and T. Schlesinger, "Magnetic decay at elevated temperature relevant to heat-assisted magnetic recording," <i>Magnetics, IEEE Transactions on</i> , vol. 45, Feb. 2009, pp. 883-8.
56. E. Evarts, Limin Cao, D. Ricketts, N. Rizzo, J. Bain , and S. Majetich, "Spin transfer torque switching of magnetic tunnel junctions using a conductive atomic force microscope," <i>Applied Physics Letters</i> , vol. 95, Sep. 2009, p. 132510 (3 pp.).
57. S. Nabavi, B. Vijaya Kumar, J. Bain , C. Hogg, and S. Majetich, "Application of image processing to characterize patterning noise in self-assembled nano-masks for bit-patterned media," <i>Magnetics, IEEE Transactions on</i> , vol. 45, Oct. 2009, pp. 3523-6.
58. H. Suzuki, W. Messner, J. Bain , V. Bhagavatula, and S. Nabavi, "A method for simultaneous position and timing error detection for bit-patterned media," <i>Magnetics, IEEE Transactions on</i> , vol. 45, Oct. 2009, pp. 3749-52.
59. Knight, B. R.; Bain, J. A. ; Schlesinger, T.E., "Magnetic Decay at Elevated Temperature Relevant to Heat-Assisted Magnetic Recording", <i>Magnetics, IEEE Transactions on</i> , v 45, Issue 2, Part 2, Feb. 2009, p 883-888.
60. S. Nabavi, B. V. K. Vijaya Kumar, and J. A. Bain , "Two-Dimensional Pulse Response and Media Noise Modeling for Bit-Patterned Media," <i>Magnetics, IEEE Transactions on</i> , v 44, Issue 11, (2008), p 3789-3792.
61. Sachan, M., Bonnoit, C., Hogg, C., Evarts, E., Bain, J.A. , Majetich, S.A., Park, J-H., and Zhu, J-G., "Self-Assembled Nanoparticle Arrays as Nanomasks for Pattern Transfer," <i>Journal of Physics D</i> , v 41 (2008), p 134001-5.
62. Zhang, L., Bain, J.A. ; Zhu, J.-G., Abelman, L.; Onoue, T. "The role of MFM signal in mark size measurement in probe-based magnetic recording on CoNi/Pt multilayers", <i>Physica B</i> , v 387, (2007), p 328-32.
63. Lee, H., Sato, T.; Ono, H.; Wang, L. Bain, J.A. ; Laughlin, D.E., "Electrode Co alloy-granular-type longitudinal media for sputtered tape applications", <i>Magnetics, IEEE Transactions on</i> , v 43 (2007), p 3497-501
64. Lee, H., Bain, J.A. , Laughlin, D.E. "Use of bias sputtering to enhance decoupling in oxide composite perpendicular recording media", <i>Applied Physics Letters</i> , v 90, (2007), p 252511/1-3
65. Ohno, T, Bain, J.A. and Schlesinger, T.E., "Observation of geometrical resonance in optical throughput of very small aperture lasers associated with surface plasmons," <i>J. Appl. Phys</i> v 101. (2007), p 83107-1-4

66. Black, E.J., Bain, J.A. , and Schlesinger, T.E., "Thermal Management in Heat-Assisted Magnetic Recording," <i>Magnetics, IEEE Transactions on</i> , vol. 43 (2007) pp 62-7.
67. Lee, H., Bain, J.A. , Choi, S. and Salvador, P. "Electrode Influence on the Transport through SrRuO ₃ /Cr-doped SrZrO ₃ /metal junctions", <i>Applied Physics Letters</i> , v 90, n 20, (2007), p 202107-1-3
68. Zhang, L., Bain, J.A. , Zhu, J.-G., Abelmann, L. and Onoue, T, "A Model of Heat Transfer in STM-based Magnetic Recording on CoNi/Pt Multilayers", <i>Physica B</i> . v. 381 (2006) pp. 204-208.
69. Zhang, L., Bain, J.A. , Zhu, J.-G., Abelmann, L. and Onoue, T, "Heat Assisted Magnetic Probe Recording on CoNi/Pt Multilayers", <i>J. of Phys D. (Applied Physics)</i> v. 39 (2006) pp. 2485-7.
70. Zhang, L., Bain, J.A. , Zhu, J.-G., Abelmann, L. and Onoue, T, " Dynamic Domain Motion of Thermal-Magnetically Formed Marks on CoNi/Pt Multilayers", <i>J. Appl. Phys.</i> v 100 (2006) pp. 53901-1-5.
71. Wang, L., Lee, H, Qin, Y., Bain, J.A. , and Laughlin, D.E., "Effects of Deposition Rate on Microstructure of CoCrPt-SiO ₂ Granular Longitudinal Media for Tape Applications", <i>Magnetics, IEEE Transactions on</i> , vol. 42 (2006) pp. 2306-2308.
72. Kaya, A., Benakli, M., Mallery, M.L., and Bain, J.A. , A Micromagnetic Study of the Effect of Spatial Variations in Damping in Perpendicular Recording Heads." <i>Magnetics, IEEE Transactions on</i> , vol. 42 (2006) pp 2428-30
73. L. Zhang, J. A. Bain , J.-G. Zhu, L. Abelmann and T. Onoue, "Characterization of heat-assisted magnetic probe recording on CoNi/Pt multilayers," <i>J of Magn. and Mag. Mat.</i> , vol. 302 (2006) pp. 16-23.
74. H. Lee, J. A. Bain and D. E. Laughlin, "Effects of substrate bias on CoPtCr-SiO ₂ magnetic recording media," <i>J of Appl. Phys.</i> , vol. 99 (2006) pp. 8G910-1-3.
75. A. Kaya and J. A. Bain , "High Frequency Susceptibility of Closure Domain Structures.," <i>J of Appl. Phys.</i> , vol. 99 (2006) pp. 8B708-1-3.
76. W. Yu, J. A. Bain , C. Ulrich and J. Unguris, "The effect of stress induced anisotropy in patterned FeCo thin film structures," <i>J of Appl. Phys.</i> , vol. 99 (2006) pp. 8B706-1-3.
77. J. A. Bain , "Analysis and optimization of terabit magnetic recording systems limited by down-track and cross-track write field gradients (invited)," <i>J of Mag. and Mag. Mat.</i> , vol. 287, pp 51-60 (2005)
78. A. Kaya, C. P. Yue and J. A. Bain , "Experimental evidence for gyromagnetic damping in magnetic heads determined by impedance measurements up to 9 GHz," <i>Magnetics, IEEE Transactions on</i> , vol. 41, (2005) pp.2923-2925.
79. H. Lee, J. A. Bain , L. Wang and D. E. Laughlin, "Thin Film Recording Media on Flexible Substrates for Tape Applications (Invited)," <i>Magnetics, IEEE Transactions on</i> , vol. 41, pp 654-659 (2005)
80. H.-S. Lee, J. A. Bain and D. E. Laughlin, "Effects of polymeric substrate roughness on head-medium spacing and recording properties of sputtered magnetic tape," <i>Magnetics, IEEE Transactions on</i> , vol. 41, (2005) pp.2529-2533.
81. P. Herget, B. Knight, J. A. Bain , T. E. Schlesinger and H. Awano, "Magnetically defined domain isolation for studies of nucleation and growth coercivities," <i>Magnetics, IEEE Transactions on</i> , vol. 41, (2005) pp.3763-3765.
82. H.-S. Lee, J. A. Bain , S.-Y. Hong and H. J. Lee, "Influence of polarity of media DC background on write/read performance in perpendicular media with an antiferromagnetically stabilized soft underlayer," <i>Magnetics, IEEE Transactions on</i> , vol. 41, (2005) pp.3157-3159.
83. L. Zhang, J. A. Bain , J.-G. Zhu, L. Abelmann and T. Onoue, "The effect of external magnetic field on mark size in heat-assisted probe recording on CoNi/Pt multilayers," <i>J. of Appl. Phys.</i> , vol. 99, (2006) pp. 023902-5.
84. Bai, D.Z., J.-G. Zhu, W. Yu, and J.A. Bain , Micromagnetic simulation of effect of stress-induced anisotropy in soft magnetic thin films. <i>Journal of Applied Physics</i> , 2004. 95(11): p. 6864-6866.

85. Bain, J.A. , M.L. Williams, and R.H. Victora, Analysis of transition shape and adjacent track aging for 1 Tb/in/sup 2/ write head designs. <i>Magnetics, IEEE Transactions on on</i> , 2004. 40(4): p. 2576-8.
86. Lee, H., J.A. Bain , and D.E. Laughlin, The application of sputtered thin film in advanced recording tape media. <i>Magnetics, IEEE Transactions on on</i> , 2004. 40(4): p. 2404-6.
87. Park, C.M., J.A. Bain , T.W. Clinton, P.A.A. van der Heijden, and T.J. Klemmer, Measurement of Ga implantation profiles in the sidewall and bottom of focused-ion-beam-etched structures. <i>Applied Physics Letters</i> , 2004. 84(17): p. 3331-3.
88. Tamaru, S., J.A. Bain , R.J.M. van de Veerdonk, T.M. Crawford, M. Covington, and M.H. Kryder, Measurement of Magnetostatic Mode Excitation and Relaxation in Permalloy Films Using Scanning Kerr Imaging. <i>Physical Review B</i> , 2004. 70: p. 104416.
89. Yang, Y., S. Shojaeizadeh, J.A. Bain , J.-G. Zhu, and M. Asheghi, Detailed Modeling of Temperature Rise in Giant Magnetoresistive Sensor During an Electrostatic Discharge Event. <i>Journal of Applied Physics</i> , 2004. 95: p. 6780.
90. Zhang, L., J.A. Bain , Z. Jian-Gang, L. Abelmann, and T. Onoue, A model for mark size dependence on field emission voltage in heat-assisted magnetic probe recording on CoNi/Pt multilayers. <i>Magnetics, IEEE Transactions on on</i> , 2004. 40(4): p. 2549-51.
91. T. Rausch, J. A. Bain , D. D. Stancil and T. E. Schlesinger, "Thermal Williams's Comstock Model for Predicting Transition Lengths in a Heat-Assisted Magnetic Recording System," <i>Magnetics, IEEE Transactions on on</i> , vol. 40, pp 137-147 (2004)
92. T. Rausch, J. A. Bain , D. D. Stancil, T. E. Schlesinger, W. A. Challener, T. McDaniel, N. Deeman and C. Brucker, "Experimental effects of laser power on the writability and pulse width in a heat assisted longitudinal recording system," <i>Japanese Journal of Applied Physics</i> , vol. 42, pp 989-94 (2003)
93. H. Lee, L. Wang, J. A. Bain and D. E. Laughlin, "Use of room-temperature bias sputtering to decrease intergranular coupling in magnetic media deposited on polymeric substrates," <i>Magnetics, IEEE Transactions on on</i> , vol. 39, pp 3616-18 (2003)
94. H. Lee, D. E. Laughlin and J. A. Bain , "Recording properties of CoCrPt tape media sputter-deposited at room temperature on polymeric substrates," <i>J. of Appl. Phys.</i> , vol. 93, pp 7783-5 (2003)
95. C.-M. Park, J. A. Bain , T. W. Clinton and P. A. A. van der Heijden, "Effects of focused-ion-beam irradiation on perpendicular write head performance," <i>J. of Appl. Phys.</i> , vol. 93, pp 6459-61 (2003)
96. A. V. Itagi, D. D. Stancil, J. A. Bain and T. E. Schlesinger, "Ridge waveguide as a near-field optical source," <i>Appl. Phys. Lett.</i> , vol. 83, pp 4474-6 (2003)
97. F. Chen, A. Itagi, J. A. Bain , D. D. Stancil, T. E. Schlesinger, L. Stebounova, G. C. Walker and B. B. Akhremitchev, "Imaging of optical field confinement in ridge waveguides fabricated on very-small-aperture laser," <i>Appl. Phys. Lett.</i> , vol. 83, pp 3245-7 (2003)
98. D. Litvinov, J. Wolfson, J. A. Bain , R. W. Gustafson, M. H. Kryder and S. Khizroev, "Narrow-gap single-pole heads," <i>Magnetics, IEEE Transactions on on</i> , vol. 38, pp 2253-5 (2002)
99. D. Litvinov, A. Lyberatos, J. Wolfson, J. Bain and S. Khizroev, "Recording layer influence on the dynamics of a soft underlayer," <i>Magnetics, IEEE Transactions on on</i> , vol. 38, pp 1994-6 (2002)
100. S. Khizroev, J. A. Bain and D. Litvinov, "Fabrication of nanomagnetic probes via focused ion beam etching and deposition," <i>Nanotechnology</i> , vol. 13, pp 619-22 (2002)
101. P. Herget, T. Rausch, A. C. Sheila, D. D. Stancil, T. E. Schlesinger, J. G. Zhu and J. A. Bain , "Mark shapes in hybrid recording," <i>Appl. Phys. Lett.</i> , vol. 80, pp 1835-7 (2002)
102. T. Rausch, P. Herget, A. Itagi, D. D. Stancil, J. A. Bain , J. G. Zhu and T. E. Schlesinger, "Effects of optical spot/magnetic head misalignment for perpendicular hybrid magnetic recording systems (invited)," <i>Transactions of the Magnetics Society of Japan</i> , vol. 2, pp 322-7 (2002)
103. T. E. Schlesinger, T. Rausch, A. Itagi, J.-G. Zhu, J. A. Bain and D. D. Stancil, "An integrated read/write head for hybrid recording," <i>Japanese Journal of Applied Physics</i> , vol. 41, pp 1821-4 (2002)

104.	W. Yu, J. A. Bain , P. Yingguo and D. E. Laughlin, "Magnetization reduction due to oxygen contamination of bias sputtered Fe/sub 35/Co/sub 65/ thin films," <i>Magnetics, IEEE Transactions on on</i> , vol. 38, pp 3030-2 (2002)
105.	L. Zhang, J. A. Bain and J.-G. Zhu, "Dependence of thermomagnetic mark size on applied STM voltage in Co-Pt multilayers," <i>Magnetics, IEEE Transactions on on</i> , vol. 38, pp 1895-7 (2002)
106.	G. Ju, R. J. M. van de Veerdonk, S. Tamaru, T. M. Crawford, G. J. Parker, Y. Kubota, M. L. Wu, S. Batra, D. K. Weller and J. A. Bain , "High Frequency Dynamics of the Soft-Underlayer in Perpendicular Recording System," <i>J. of Appl. Phys.</i> , vol. 91, pp 8052-8054 (2002)
107.	C.-L. Lee, J. A. Bain , S.-Y. Chu and M. E. McHenry, "Separation of Contributions to Spin Valve Interlayer Exchange Coupling Field by Temperature Dependent Coupling Field Measurements," <i>J. of Appl. Phys.</i> , vol. 91, pp 7113-7115 (2002)
108.	H. Lee, D. E. Laughlin and J. A. Bain , "Controlling the Magnetic Properties of CoCrPt Thin Films by Means of Thin Hexagonal-close-packed Intermediate Layers," <i>J. of Appl. Phys.</i> , vol. 91, pp 7065-7067 (2002)
109.	H. Lee, J. A. Bain and D. E. Laughlin, "Improvement of preferred orientation of NiAl/CrMn underlayers deposited on prebaked tape substrates," <i>J. of Appl. Phys.</i> , vol. 91, pp 8736-8738 (2002)
110.	S. Min, J. A. Bain and D. W. Greve, "Control of Stress and Plasma-induced Heating During DC Magnetron Sputtering of Permalloy Films for Microelectromechanical Systems," <i>J. of Appl. Phys.</i> , vol. 91, pp 6824-6826 (2002)
111.	C.-M. Park and J. A. Bain , "Focused-Ion-Beam Induced Grain Growth in Magnetic Materials for Recording Heads," <i>J. of Appl. Phys.</i> , vol. 91, pp 6830-6832 (2002)
112.	S. Tamaru, J. A. Bain , R. J. M. van de Veerdonk, T. M. Crawford, M. Covington and M. H. Kryder, "Imaging of Quantized Magnetostatic Modes Using Spatially Resolved Ferromagnetic Resonance," <i>J. of Appl. Phys.</i> , vol. 91, pp 8034-8036 (2002)
113.	J. T. Wolfson, J. A. Bain , S. K. Khizroev and D. Litvinov, "Dynamic Kerr Imaging of Soft Underlayers for Perpendicular Magnetic Recording Applications (Invited)," <i>J. of Appl. Phys.</i> , vol. 91, pp 8665-8669 (2002)
114.	C.-M. Park and J. A. Bain , "Local degradation of magnetic properties in magnetic thin films irradiated by Ga/sup +/- focused-ion-beams," <i>Magnetics, IEEE Transactions on on</i> , vol. 38, pp 2237-9 (2002)
115.	D. Litvinov, J. Wolfson, J.A. Bain , R. W. Gustafson, M. H. Kryder and S. Khizroev, "The role of the gap in single pole heads in perpendicular recording," <i>Magnetics, IEEE Transactions on on</i> , vol. 38, pp 1658-63 (2002)
116.	P. Zou and J. A. Bain , "Surface Nitrogen Concentration Dependence of the Nitrogen Incorporation in Reactively Sputtered FeXN Films," <i>J. of Appl. Phys.</i> , vol. 91, pp 6827-2829 (2002)
117.	P. Zou, W. Yu and J. A. Bain , "Effect of Stress on Stripe Domain Onset in Sputtered FeN and CoFe Films," <i>J. of Appl. Phys.</i> , vol. 91, pp 7830-7832 (2002)
118.	P. Zou, W. Yu and J. A. Bain , "Influence of stress and texture on soft magnetic properties of thin films," <i>Magnetics, IEEE Transactions on on</i> , vol. 38, pp 3501-20 (2002)
119.	C.-L. Lee, S. Chu, J. A. Bain and M. E. McHenry, "Analysis of angular dependent resistance measurements on IrMn-based spin valves using a finite pinning model," <i>Magnetics, IEEE Transactions on on</i> , vol. 38, pp 2694-6 (2002)
120.	D. Litvinov, R. Chomko, J. T. Wolfson, E. B. Svedberg, J. A. Bain , R. M. White, R. Chantrell and S. K. Khizroev, "Dynamics of Perpendicular Recording," <i>Magnetics, IEEE Transactions on on</i> , vol. 37, pp 1376-1378 (2001)
121.	J. T. Wolfson and J. A. Bain , "Kerr Imaging of Thin Film Magnetic Transducer to Measure Thin-Film Head Fields," <i>Magnetics, IEEE Transactions on on</i> , vol. 37, pp 2761-2763 (2001)

122.	J. P. van't Hof, J. A. Bain , J.-G. Zhu, and R. M. White, "An Undergraduate Laboratory for Data Storage," <i>IEEE Transactions on Education</i> , vol. 44, pp. 224-231, 2001.
123.	B. Bian, J. A. Bain , K. Soon-Ju and D. E. Laughlin, "High coercivity Co-alloy thin films on polymer substrates," <i>Magnetics, IEEE Transactions on on</i> , vol. 37, pp 1640-2 (2001)
124.	G. Ju, R. J. M. van de Veerdonk, E. B. Svedberg, K. W. Wierman, D. Weller, K. J. Howard, M. H. Kryder, S. Tamaru, J. T. Wolfson and J. A. Bain , "Sub-nanosecond non-Arrhenius magnetic switching in perpendicular multilayers," <i>Magnetics, IEEE Transactions on on</i> , vol. 37, pp 1570-2 (2001)
125.	R. J. M. van de Veerdonk, G. Ju, E. B. Svedberg, D. Weller, S. Tamaru, J. T. Wolfson and J. A. Bain , "Real-time observation of sub-nanosecond magnetic switching in perpendicular multilayers," <i>J of Mag. and Mag. Mat.</i> , vol. 235, pp 138-42 (2001)
126.	F. Sarigoz, B. V. K. Kumar and J. A. Bain , "Performance of Dropout Correction on Real Magnetic Tape Waveforms with Dropouts," <i>Magnetics, IEEE Transactions on on</i> , vol. 37, pp 639-645 (2001)
127.	F. Sarigoz, H. Song, B. V. K. Kumar and J. A. Bain , "Dropout-tolerant read channels," <i>IEEE Journal on Selected Areas in Communications</i> , vol. 19, pp 744-755 (2001)
128.	P. Zou and J. A. Bain , "Residual Stress Optimization in FeAlN Pole Materials," <i>Magnetics, IEEE Transactions on on</i> , vol. 36, pp. 2536-2537, 2000.
129.	F. Sarigoz, G. Li, B. V. K. Kumar, J. A. Bain , and J.-G. Zhu, "Analysis of Dropout Peakshift in Magnetic Tape Recording," <i>Magnetics, IEEE Transactions on on</i> , vol. 36, pp. 2170-2172, 2000.
130.	J. A. Bain , K. Pellerin, J. T. Chow, and P. Zou, "Growth Rate Dependence of Nitrogen Incorporation in Reactively Sputtered FeAlN Films for Recording Head Poles," <i>Magnetics, IEEE Transactions on on</i> , vol. 36, pp. 3472-3474, 2000.
131.	L. R. Carley, J. A. Bain , G. K. Fedder, D. W. Greve, D. F. Guillou, M. S. C. Lu, T. Mukherjee, S. Santhanam, L. Abelmann, and S. Min, "Single Chip Computers With MEMS-Based Magnetic Memory (Invited)," <i>J. of Appl. Phys.</i> , vol. 87, pp. 6680-6685, 2000.
132.	L. Abelmann, J.-G. Zhu, J. A. Bain , K. Ramstock, and C. Lodder, "Micromagnetic Simulation of a Flux Guide for a Read Head with Sub 100-nm Resolution," <i>J. of Appl. Phys.</i> , vol. 87, pp. 5538-5540, 2000.
133.	L. Abelmann, S. K. Khizroev, D. Litvinov, J.-G. Zhu, J. A. Bain , M. H. Kryder, K. Ramstock, and C. Lodder, "Micromagnetic Simulation of an Ultra-small Single Pole Perpendicular Write Head," <i>J. of Appl. Phys.</i> , vol. 87, pp. 6636-6638, 2000.
134.	"Pulse Asymmetries and Write Non-linearities in the Write Equalization Process for Magnetic Tape Recording, G.S. Park, M. Ni, and J.A. Bain , <i>Magnetics, IEEE Transactions on on</i> , vol. 35 (1999) pp. 2262-4.
135.	"Limitation to Track Following Imposed by Position Error Signal SNR Using a Multi-Tapped Magnetoresistive Servo Head," (Invited) James A. Bain , William C. Messner, John H. Steele II, Theodore A. Schwarz, William J. O'Kane, and Maura P. Connolly, <i>Magnetics, IEEE Transactions on on</i> , vol. 35 (1999) pp. 741-745
136.	"Multi-Tapped Magnetoresistive Heads for Magnetic Tape Tracking Servo," J.H. Steele II, W.C. Messner, J.A. Bain , T.A. Schwarz, W.J. O'Kane, and M.P. Connolly, <i>Magnetics, IEEE Transactions on on</i> , V. 34 (1998) pp. 1904-1906.
137.	"High Frequency Initial Permeability of NiFe and FeAlN," W.P. Jayasekara, J.A. Bain , and M.H. Kryder, <i>Magnetics, IEEE Transactions on on</i> , V. 34 (1998) pp. 1438-1440.
138.	"MFM Quantification of Magnetic Fields Generated by Ultra-Small Single Pole Perpendicular Heads," S.K. Khizroev, W. Jayasekara, J.A. Bain , R.E. Jones, Jr., and M.H. Kryder, <i>Magnetics, IEEE Transactions on on</i> , V. 34 (1998) pp. 2030-2032.
139.	"A Reactive Ion Milling Process for Patterning Narrow Track Iron Nitride Recording Head Poles at the Wafer Level," W.P. Jayasekara, J. Grant, J.A. Bain , M.H. Kryder and A.E.T. Kuiper, <i>Magnetics, IEEE Transactions on on</i> , vol. 33 (1997) pp. 2830-2832.

140. "Considerations in the Design of Probe Heads for 100Gbit/in ² Recording Density," S.K. Khizroev, J.A. Bain and M.H. Kryder, <i>Magnetics, IEEE Transactions on</i> , vol. 33 (1997) pp. 2893-2895.
141. "Magnetic Properties of FeAlN Films at Elevated Temperatures," P. Zheng, J. Bain and M.H. Kryder, <i>J. of Appl. Phys.</i> , vol. 81, (1997) pp. 4498-4197.
142. "Narrow Track Dual Magnetoresistive Read Heads For Tape," I. Trindade, A. Kennedy, J.A. Bain and M.H. Kryder, <i>J. Appl. Phys.</i> , vol. 81 (1997) pp. 4524-4526.
143. "The Effect of Nitrogen Partitioning on the Soft Magnetic Properties of FeAlN Films," P. Zheng, J.A. Bain and M.H. Kryder, <i>Magnetics, IEEE Transactions on</i> , vol. 32 (1996) pp. 4541-4543.
144. "Tape Erase Band Measured by MFM Compared to MR Head Cross Erase Band Responses," T. Pan, A.C. Kennedy, J.A. Bain , Y. Yip and T. Schwarz, <i>Magnetics, IEEE Transactions on</i> , vol. 32 (1996) pp. 3407-3409.
145. "Thin Film Tape Recording Heads with High Moment FeAlN Poles," J.A. Bain , J. Wolfson, M.H. Kryder, Y. Yip, T. Schwarz, J. Reid, R.D. Silkensen and R.H. Dee, <i>Magnetics, IEEE Transactions on</i> , vol. 32 (1996) pp. 166-171. (Invited)
146. "The Effect of Substrate Temperature on the Magnetic Properties of FeAlN Thin Films for Recording Heads," J.A. Bain and M.H. Kryder, <i>Magnetics, IEEE Transactions on</i> , vol. 31 (1995) pp. 2703-2705.
147. "Design of Small Recording Head Elements Using Thermally Constrained Transmission Line Modeling," J.A. Bain , W. Jayasekara, A. Jander, R.S. Indeck and M.H. Kryder, <i>Magnetics, IEEE Transactions on</i> , vol. 31 (1995) pp. 2675-2677.
148. "The Effect of Surface Topography on the Soft Magnetic Properties of FeAlN Films," P. Zheng, J.A. Bain and M.H. Kryder, <i>Magnetics, IEEE Transactions on</i> , vol. 31 (1995) pp. 2700-2702.
149. "X-ray Diffraction Characterization of Strain and Crystallographic Texture in Thin Film Media," B.M. Clemens, J.A. Bain , S. M. Brennan and H. Kataoka, <i>IEEE Trans. on Mag.</i> , vol. 29 (1993) pp. 300-306. (Invited)
150. "X-ray Analysis of Compositional Modulation in Co/Pt Multilayer Films for Perpendicular Recording," J.A. Bain , B.M. Clemens, H. Notarys, E. Marinero and S. Brennan, <i>J. Appl. Phys.</i> , vol. 74 (1993) pp. 996-1000.
151. "Crystallographic Anisotropy in Thin Film Magnetic Recording Media Analyzed with X-ray Diffraction," H. Kataoka, J.A. Bain , S. Brennan and B.M. Clemens, <i>J. Appl. Phys.</i> vol. 73 (1993) pp. 7591-7598.
152. "Elastic Strains and Coherency Stresses in Mo/Ni Multilayers," J.A. Bain , L.J. Chyung, S.M. Brennan and B.M. Clemens, <i>Phys. Rev. B</i> . vol. 44 (1991) pp. 1184-1192.

CONFERENCE PAPERS (PEER-REVIEWED)

1. Kim, Y., Sharma, A., Mateescu, R., Song, S-H., Bandic, Z., Bain, J.A. , Bhagavatula, V., "Locally rewritable codes for resistive memories," ICC: International Communications Conference, vol., 34, no.9, pp. 2470-2485, May 2016
2. Chabalko, M.J., Gamble, E.Q.A., Kong, Y., Hussin, R., Slovin, G., Luo, Yi, Schlesinger, T.E., Kuriyama, K., Bain, J.A. , "HAMR near field transducers based on microcavity disk lasers," APMRC 2012, pp. 1-2, November 2012.
3. Tan, C. C., Zhao, R., Shi, L., Chong, T. C., Bain, J. A. , Schlesinger, T. E., Malen, J. A., & Ong, W. L. (2011). Thermal conductivity measurements of nitrogen-doped Ge ₂ Sb ₂ Te ₅ . <i>Non-Volatile Memory Technology Symposium (NVMTS)</i> , 2011 11th Annual (7-9 Nov. 2011), 1-4.
4. Draghi, L.J.; Bain, J.A. ; Fedder, G.K., "Self-engaging and disengaging CMOS-MEMS probes," Micro Electro Mechanical Systems (MEMS), 2011 <i>IEEE 24th International Conference on</i> , pp.1273-1276, 23-27 Jan. 2011

5.	Wen, C.-Y.; Chua, E.K.; Zhao, R.; Chong, T.C.; Bain, J.A. ; Schlesinger, T.E.; Pileggi, L.T.; Paramesh, J.; , "A phase-change via-reconfigurable on-chip inductor," Electron Devices Meeting (IEDM), <i>2010 IEEE International</i> , vol., no., pp.10.3.1-10.3.4, 6-8 Dec. 2010
6.	Black, E.J.; Kong, Y.; Powell, S.; Chabalko, M.; Luo, Y.; Schlesinger, T.E; Bain, J.A. ; , "Coupled plasmonic waveguides: Near field transducers for HAMR," <i>APMRC, 2010 Digest</i> , vol., no., pp.1-2, 10-12 Nov. 2010
7.	Bain, J.A. ; El-Ghazaly, A.; Bromberg, D.; Fedder, G.K.; Messner, W.C.; , "Electrothermal actuators for hard disk drive applications," <i>APMRC, 2010 Digest</i> , vol., no., pp.1-2, 10-12 Nov. 2010
8.	Liu, J.; Draghi, L.; Noman, M.; Bain, J.A. ; Schlesinger, T.E.; Fedder, G.K.; , "High current low contact resistance platinum-coated CMOS-MEMS probes," Micro Electro Mechanical Systems (MEMS), <i>2010 IEEE 23rd International Conference on</i> , vol., no., pp.1143-1146, 24-28 Jan. 2010
9.	Liu, J.; Draghi, L.; Bain, J.A. ; Schlesinger, T.E.; Fedder, G.K.; , "Three-DOF CMOS-MEMS probes with embedded piezoresistive sensors," Micro Electro Mechanical Systems (MEMS), <i>2010 IEEE 23rd International Conference on</i> , vol., no., pp.284-287, 24-28 Jan. 2010
10.	Evarts, E. R.; Farkas, T. T.; Tsukerman, B.; Cao, L.; Ricketts, D.; Markovich, G.; Bain, J. A. ; Majetich, S. "Noise Measurements on Magnetic Tunnel Junction Nanopillars using Conductive Atomic Force Microscopy", in <i>Magnetics, IEEE Transactions on</i> , vol.46, no.6, pp.1741-1744, June 2010
11.	Smith, J. R.; Hu, W.; Dang, Y. Y.; Ozcan, O.; Sitti, M.; Bain, J. A. ; Ricketts, D.; Davis, R. F. "Scanning Probe Nanomanufacturing on Si: Surface Characterization of the Process Technique", <i>Materials Research Symposium (2010)</i> .
12.	Evarts, E. R.; Moneck, M.; Booth, R. A.; Hogg, C.; Ricketts, D.; Zhu, J.-G.; Bain, J. A. ; Majetich, S. "Spin Torque Switching of 26 nm Diameter Magnetic Tunnel Junction Using a Conductive Atomic Force Microscope", <i>Conference on Magnetism and Magnetic Materials</i> , Atlanta, GA, paper FC-13, Nov. 2010.
13.	J. Liu, M. Noman, J. Bain , T. Schlesinger, and G. Fedder, "Lever-based CMOS-MEMS probes for reconfigurable RF IC'S," 22nd IEEE International Conference on Micro Electro Mechanical Systems, MEMS 2009, January 25, 2009 - January 29, 2009, Sorrento, Italy: <i>Institute of Electrical and Electronics Engineers Inc.</i> , 2009, pp. 1111-1114.
14.	J. Liu, L. Draghi, M. Noman, J. Bain , T. Schlesinger, and G. Fedder, "Platinum sputtered CMOS-MEMS electrothermal probes with piezoresistive force sensing," <i>2009 IEEE Sensors</i> , Christchurch, New Zealand: Oct. 2009, pp. 1911-1914.
15.	J. Liu, M. Noman, J. Bain , T. Schlesinger, and G. Fedder, "Polysilicon sensors for CMOS-MEMS electrothermal probes," TRANSDUCERS 2009 - 15th International Conference on Solid-State Sensors, Actuators and Microsystems, June 21, 2009 - June 25, 2009, Denver, CO, United states: <i>IEEE Computer Society</i> , 2009, pp. 2425-2428.
16.	W. Messner, J. Bain , M. Koenders, J. Groenesteijn, G. Marsman, P. Gilgunn, and G. Fedder, "A CMOS-MEMS rotary microactuator suitable for hard disk drive applications," TRANSDUCERS 2009 - 15th International Conference on Solid-State Sensors, Actuators and Microsystems, June 21, 2009 - June 25, 2009, Denver, CO, United states: <i>IEEE Computer Society</i> , 2009, pp. 1509-1512.
17.	J. Liu, M. Noman, J.A. Bain , T.E. Schlesinger and G.K. Fedder, "Lever-Based CMOS-MEMS Probes for Reconfigurable RF IC's", <i>MEMS '09</i> , Jan. 25-29, 2009, Sorrento, ITALY.
18.	Lo, H. and Bain, J. , "Effects of High Current Density at Nanoscale Point Contacts," <i>Micro/Nanoscale Heat Transfer International Conference (MNHT)</i> , MNHT2008-52349, Tainan, Taiwan, Jan 6-9, 2008.
19.	J. Liu, M. Noman, J.A. Bain , T.E. Schlesinger and G.K. Fedder, "MEMS Probes for Reconfigurable IC's", <i>MEMS '08</i> , Jan. 13-17, 2008, Tucson, Arizona, US.
20.	S. Nabavi, B. V. K. Vijaya Kumar, and J. A. Bain , "Mitigating the Effects of Track Mis-Registration in Bit-Patterned Media," <i>Proceedings of IEEE International Conference on Communications</i> , Pages: 2061-2065, 2008.

21. Lo, H. and Bain, J. , "Thermal Design for Probe Transformation of Phase Change Vias," <i>International Mechanical Engineering Congress and Exposition (IMECE)</i> , IMECE2008-66441, Boston, MA, Nov 2-6, 2008.
22. Lo, H. and Bain, J.A. "Effects Of High Current Density At Nanoscale Point Contacts", , <i>Proceedings of MNHT2008, Micro/Nanoscale Heat Transfer International Conference</i> , January 6-9, 2008, Tainan, Taiwan. (in press)
23. F. Sarigoz, B. V. K. Kumar, and J. A. Bain , "Characterization and equalization of dropouts in the magnetic tape recording channel," <i>Proceedings of 2000 International Conference on Acoustics, Speech and Signal Processing</i> , vol. 6, pp. 3554-3557, 2000.
24. "Structural Characterization of Pt/Co Multilayers for Magneto Optic Recording Using X-ray Diffraction," J.A. Bain , <i>B.M. Clemens and S. Brennan</i> , <i>MRS Conference Proceedings</i> , vol. 313 (1993) pp. 799-804.
25. "Microstructural Dependence of the Perpendicular Anisotropy in Co-Pt Alloys," E.E. Marinero, R.F.C. Farrow, G.R. Harp, R.H. Geiss, J.A. Bain and B.M. Clemens, <i>MRS Conference Proceedings</i> , vol. 313 (1993) pp. 677-683.
26. "Strain Relaxation During Growth of Epitaxial Fe on Cu (001)/MgO(001)," B.J. Daniels, N.M. Rensing, J.A. Bain , S. Brennan, B. Lairson, A.P. Payne and B.M. Clemens, <i>MRS Conference Proceedings</i> , vol. 312 (1993) pp.101-106.
27. "In-Situ Observation of the Initial Stages of Co (0001) Epitaxy on Pt (111) Using Grazing Incidence X-ray Diffraction," J.A. Bain , B.M. Clemens, and S. Brennan, <i>MRS Conference Proceedings</i> , vol. 312 (1993) pp. 291-296.
28. "Structural Characterization of Multilayers Using X-ray Diffraction," B.M. Clemens, J.A. Bain , A.P. Payne, T.C. Hufnagel and S.M. Brennan, <i>MRS Conference Proceedings</i> , vol. 239 (1992) pp. 475-486.
29. "Magnetic Anisotropy of Crystalline Defects," B.M. Clemens, R.L. White, W.D. Nix and J.A. Bain , <i>MRS Conference Proceedings</i> , vol. 231 (1992) pp. 459-464. (Invited)
30. "Coherency Stresses in Mo/Ni multilayer Films," J.A. Bain , L.J. Chyung, S. Brennan and B.M. Clemens, <i>MRS Conference Proceedings</i> , vol. 221, (1992) pp. 477-482.
31. "Interfacial Composition and Structure in Pt/Ni and Pt/Nb Multilayer Thin Films," J.A. Bain and B.M Clemens, <i>MRS Conference Proceedings</i> , vol. 187 (1990), pp. 315 320.

OTHER PAPERS IN SYPOSIUM OR CONFERENCE PROCEEDINGS

1. Kim, Y., Sharma, A., Mateescu, R., Song, S.H., Bandic, Z., Bain, J.A. , Bhagavatula, V., "Locally rewritable codes for resistive memories," ICC: International Communications Conference, Submitted November, 2015.
2. Sharma, A.A., Jackson, T.C., Schulaker, M., Kuo, C., Augustine, C., Bain, J.A. , Wong, H.-S.P, Mitra, S., Pileggi, L.T., Weldon, J.A. (2015), "High Performance, Integrated 1T1R Oxide-based Oscillator: Stack Engineering for Low-Power Operation in Neural Network Applications". 2015 <i>VLSI Technology and Circuits Symposium</i> . T186-T187, June 2015
3. A.A.; Skowronski, M.; Bain, J.A. ; Weldon, J.A., "Novel CMOS-compatible a-Si based oscillator and threshold switch," in <i>Solid State Device Research Conference (ESSDERC)</i> , 2015 45th European , vol., no., pp.93-96, 14-18 Sept. 2015
4. Weldon, J.A., Jackson, T., Sharma, A.A, Bain, J.A. Pileggi, L. "An RRAM-Based Oscillatory Neural Network," <i>Latin American Symposium of Circuits and Systems</i> , February, 2015
5. Wen, C.Y., Slovin, G., Bain, J.A. , Schlesinger, T.E., Pileggi, L., Paramesh, J., "A Phase-Change Via-Reconfigurable CMOS LC VCO, <i>Symposium on VLSI Technology and Circuits</i> , June 2013
6. J.A. Bain and D.D. Stancil, "High Efficiency Near Field Sources for Heat Assisted Magnetic Recording," <i>Digest of the 2009 Magnetics and Optics Research International Symposium for New Storage Technology (MORIS 2009)</i> , Jun. 2009.

7.	C. Hogg, S. Majetich, and J. Bain , "Exploring the limits of RIE-based pattern transfer using self-assembled nanoparticle arrays as etch masks.," <i>Digest of the International Magnetics Conference, InterMag 2009</i> , May. 2009.
8.	Sharma, A.A., Noman, M., Picard, Y., Salvador, P., Skowronski, M., Bain, J.A. , "Effect of Doping on Resistive Switching Oxide Conductivity," <i>MRS Spring Meeting and Exhibit</i> , April 2013
9.	J. Bain , D.D. Stancil, E. Black, T. Schlesinger, Y. Kong, and Y. Luo, "Near field HAMR optical sources suitable for excitation with single mode waveguides," <i>Digest of the 20th International Conference on Magnetic Recording Heads and Systems</i> , Oct. 2009.
10.	S. Nabavi, V. Bhagavatula, and J. Bain , "Equalization and Detection for Bit-Patterned Media Recording (BPMR) Channels with Inter-Track Interference," <i>Digest of the 20th International Conference on Magnetic Recording Heads and Systems</i> , Oct. 2009.
11.	James C. Salvia James A. Bain C. Patrick Yue "Tunable On-Chip Inductors up to 5 GHz using Patterned Permalloy Laminations", <i>Proceedings of 2005 IEEE International Electron Devices Meeting</i> , Washington, DC, December 5 - 7, (2005)
12.	Herget, P., T.E. Schlesinger, J.A. Bain , D.D. Stancil, and H. Awano, <i>MAMMOS read-only memory. Proceedings of the SPIE - The International Society for Optical Engineering</i> , 2004. 5380(1): p. 163-70.
13.	Itagi, A.V., T.E. Schlesinger, J.A. Bain , and D.D. Stancil. Analytical Evaluation of the Electromagnetic Fields of a Near-Field Circular Aperture in a Real Conductor at Optical Frequencies. <i>in Proceedings of 2003 International Symposium on Optical Memory</i> . 2004. Nara, JAPAN
14.	Ohno, T., A.V. Itagi, C. Fang, J.A. Bain , and T.E. Schlesinger, Characterization of very small aperture GaN lasers. <i>Proceedings of the SPIE - The International Society for Optical Engineering</i> , 2004. 5380(1): p. 393-402.
15.	Zhou, L., J.A. Bain , T.E. Schlesinger, M. Lang, and T.D. Milster, Prototype mode index lens for heat-assisted magnetic recording. <i>Proceedings of the SPIE - The International Society for Optical Engineering</i> , 2004. 5380(1): p. 28-33.
16.	A. V. Itagi, T. E. Schlesinger, J. A. Bain and D. D. Stancil, "Efficiency of Light Coupling From a Light Delivery System to a Planar Waveguide for Optical and Hybrid Recording Heads," <i>Proc. SPIE-Int. Soc. Opt. Eng.</i> , vol. 5069, pp 341 (2003)
17.	F. Chen, A. V. Itagi, L. Stebounova, J. A. Bain , D. D. Stancil, G. C. Walker and T. E. Schlesinger, ""A Study of Near-field Aperture Geometry Effects on Very Small Aperture Lasers (VSAL)," <i>Proc. SPIE- Int. Soc. Opt. Eng.</i> , vol. 5069, pp 312 (2003)
18.	T. Rausch, A. Itagi, P. Herget, J. A. Bain , D. D. Stancil and T. E. Schlesinger, "Heat assisted magnetic recording (invited)," in <i>Proceedings of MORIS 2002</i> , (2002)
19.	T. Rausch, J. A. Bain , D. D. Stancil, and T. E. Schlesinger, "Near-field Hybrid Recording with a Mode Index Lens," <i>Proceedings of Optical Data Storage Conference (SPIE)</i> , vol. 4090, pp. 66-71, 2000.
20.	J. Liu, H. Song, B. V. K. Kumar, H. P. D. Shieh, and J. A. Bain , "Channel modeling for hybrid magneto-optical recording," <i>Proceedings of Optical Data Storage Conference (SPIE)</i> , vol. 4090, pp. 292-299, 2000.
21.	"Fine Grain Barium Thin Films with Perpendicular C-axis Orientation," Y. Chen, J.A. Bain and M.H. Kryder, <i>4th Perpendicular Magnetic Recording Conference (PMRC)</i> , October 20-23, Akita, Japan, 1997.
22.	"Recording Heads: Write Heads for High Density Magnetic Tape," J.A. Bain , presented at SPIE '95, Philadelphia, PA, <i>SPIE Proceedings</i> , vol. 2604 (1995) pp. 165 175. (Invited)
23.	"Advanced Materials and Devices for High Density Recording and Readback Heads," M.H. Kryder, J.A. Bain and M. Xiao, <i>Proc. of ISPMM '95</i> , Seoul, Korea, Aug., 1995. (Invited)

OTHER WRITINGS	
1.	T. Rausch, J. A. Bain and T. E. Schlesinger, "Does hybrid recording have a future?," Insight Magazine, Winter, pp 8 (2002)
2.	T. Rausch, J. A. Bain and T. E. Schlesinger, "Hybrid recording," Data Storage Magazine, 8, pp 16-22 (2001)
3.	National Storage Industry Consortium Tape Technology roadmap, Heads Section, June 2001
4.	National Storage Industry Consortium Tape Technology roadmap, Heads Section, June 1998.
5.	"A Checklist for Use in the Preparation of Scientific Documents (v. 1.0)," J.A. Bain , Unpublished. (1997)
6.	"Next Generation Pole Materials for Magnetic Recording Heads," J.A. Bain , Data Storage Magazine, vol. 3, no. 7, (1996) pp. 61-66. (Invited)
7.	"Structural Characterization of Thin Metallic Films and Multilayers Using X-ray Diffraction," J.A. Bain , Ph.D. Thesis, Department of Materials Science and Engineering, Stanford University, (1993). 195 pp.
8.	"Stress Determination in Textured Thin Films Using X-ray Diffraction," B.M. Clemens and J.A. Bain , MRS Bulletin, vol. 17, no. 7 (1992) pp. 46 51. (Invited)

PATENTS	
1.	Bain, J.A. , Chabalko, M.J., Schlesinger, T.E., Luo, Y., Kong, Y., "Dielectric Resonator Driven Near Field Transducer," CMU Disclosure Number 2013-013, Patent No. 9,246,549, filed Aug. 16, 2013
2.	Pileggi, L.; Bain, J.A. ; Schlesinger, T E , "Reconfigurable IC interconnect using resistance change materials and MEMS probes", Application No. 2005-100, filed 2011
3.	Bain, J.A. ; Schlesinger, T E; Powell, Stephen P; Black, Eric J., "Coupled Plasmonic Waveguides and Associated Apparatus and Methods", Application No. 12/780,207, filed April 2010
4.	Stancil; Daniel D., Itagi; Amit, Schlesinger; Tuviah E., Bain; James A. , Rausch; Tim, "Device with waveguide defined by dielectric in aperture of cross-track portion of electrical conductor for writing data to a recording medium," US Patent #6,999,384 (2006)
5.	D. D. Stancil, T. Rausch, A. Itagi, J. A. Bain and T. E. Schlesinger, "An integrated transducer for hybrid recording", US Patent: pending (2004)
6.	T. Rausch, J. A. Bain , D. D. Stancil and T. E. Schlesinger, "Solid immersion lenses for focusing collimated light in the near-field region", US Patent: 6,594,430 (2003)
7.	X. Sui, J. A. Bain and M. H. Kryder, "Method of enhancing the c-axis perpendicular orientation of barium hexaferrite thin films and barium hexaferrite thin film recording media produced thereby", US Patent: 5,863,661 (1999)

SPONSORED GRANTS (★ INDICATES PI)	
1.	"Acousto-Optic Gyroscope (AOG)," PI: G. Piazza, CO-PI: J. Bain, T. Mukherjee SPAWAR (DARPA Prime), \$2,268,878, (February 2016 – August 2017)
2.	★ "High Throughput Studies of Phase Change Chalcogenide Materials for Simultaneous Improvement in Memory Cell SET Speed and RESET" PI: J. Bain, Co-PI: M. Skowronski, SRC-STARNET (FAME Center), \$380,000, (January 2016 – December 2018)
3.	"Design, Characterization, and Modeling of NDR-based Oscillators and Threshold Switches," PI: J. Weldon, Co-PI: J. Bain, SRC, \$300,000, (January 2015 – December 2017)
4.	"Thermal and Optical Tradeoffs in Plasmonic Materials Systems," Co-PI's: J. Malen, J. Bain, NSF, \$340,087, (July 2014 – June 2017)
5.	"Characterization Equipment for Reconfigurable RF Integrated Circuits," PI: Paramesh Co-PI's are

Bain, Carley, Fedder, Mukherjee, G. Piazza, Pileggi, Weldon, \$176,900, (April 2014 – June 2014.)
6. “Magnetically Activated Reconfiguration of Pixelated Antennas (MARPA),” CO PI’s: G. Piazza, J. Bain, DARPA, \$2,483,913, (November 2013 – November 2017)
7. ★ “Development and Testing of Phase Change Switch for RF Systems,” PI/Co-PI: J.Bain, PI/Co-PI: T. E. Schlesinger, Co-PI: J. Paramesh, Northrup Grumman (Prime: DARPA), \$1,591,821, (August 2012 – March 2016)
8. “Nanoscale Thermometry of Oxide RRAM”, PI: M. Skowronski, Co-PI: J.A. Bain, SRC, \$300,000, (January 2012 - September 2014).
9. Center for MEMS Instrumented Self-Configuring Integrated Circuits, DARPA (Co-PI: T. E. Schlesinger, L. Pileggi, J. Bain, J Paramesh, and G. Fedder), \$800,000/yr, (June 2010 – June 2013.)
10. “Engineering Research Center in Memory Intensive Self-Configuring Integrated Circuits”, PI: T.E. Schlesinger, Co-PI: J.A. Bain, SPAWAR, \$463,442, (June 2010 - June 2011).
11. “Memristive Materials and Devices”, PI: M. Skowronski, Co-PIs: J.A. Bain and P. Salvador, Air Force, \$639,927, (October 2010 - December 2013).
12. ★ “STTR Phase II: Tunable RF Front Ends for Wireless Devices”, PI: J.A. Bain, CarleyTech, \$152,373, (April 2010 – March 2012).
13. “GOALI: Accelerating Adoption of Magnetic MEMS Technology”, PI: T. Mukherjee, Co-PI: J.A. Bain, \$120,000, (June 2010 – May 2011).
14. ★ “Investigation of Nanoscale Spin Dynamics with Scanning Probes”, PI: J.A. Bain, Co-PI: S. Majetich, NSF \$377,573, (September 2009 – August 2012).
15. “Tip-Directed Field Emission Assisted Nanomanufacturing”, PI: D. Ricketts, Co-PI: J.A. Bain, DARPA \$4,186,411, (January 2008 – June 2011)
16. ★ “Scanning Pump Probe Spin Stand Analysis”, PI: J.A. Bain, Seagate, \$89,000 (November 2007 - October 2008)
17. ★ “Light Delivery of HAMR”, PI J.A. Bain, Seagate, \$89,000 (October 2007 - September 2008)
18. “CMOS MEMS Rotary Actuator for Disk Drive Applications”, PI: W. Messner, Co PI’s: J.A. Bain and G.K Fedder, Seagate \$110,000 (June 2007 – June 2009)
19. “Center for Memory Intensive Self-Configuring Integrated Circuits”, PI: T.E. Schlesinger, Co-PI: J.A. Bain, DARPA, \$3,000,000 (October 2006 - September 2012)
20. ★ “Non-volatile Resistance Change Vias for Memory Intensive Self-Configuring IC's (MISC IC's)", PI: J.A. Bain, UCLA (MARCO FENA), \$175,000 (September 2006 - March 2009)
21. ★ “Scalability of Resistive Switching Non-volatile Memories Using Mobile Dopant Materials”, PI: J.A. Bain, Co-PI’s: P. Salvador and M. Skowronski, SRC, \$810,000 (June 2006 - June 2009)
22. “NIRT: Single particle Per Bit Magnetic Information Storage”, PI: Sara Majetich, Co-PI J.A. Bain, NSF, \$2,000,000 (September 2005 - September 2009)
23. ★ “Examination of the feasibility of Delta-R Perovskites Films for Probe Storage”, PI: J.A. Bain, Co-PI P. Salvador, Intel Corp. \$450000, (June 2003-June 2006)
24. “Susceptibility of Magnetic Information Storage to Power Frequency Magnetic Fields”, PI: J.F. Hoburg, Co-PI J.A. Bain, EPRI, \$150,000 (Oct 2002-Dec 2003)
25. ★ "Sputtered Thin Film Tape Media" PI: J.A. Bain, Co-PI D.E. Laughlin, Imation Corp, \$300,000 (Jan 2003-Jan 2006)
26. "Methods to Assess the Probability of a Disk being recorded in a Disk Drive" PI: V. Bhagavatula, Co-PI J.A. Bain, TTSWG, \$400,000 (May 2002-May 2004)
27. "Heat Assisted Magnetic Recording (HAMR)" PI: M.H. Kryder, Co-PI J.A. Bain, Dept of Commerce ATP Program, \$20,000,000, (2001-2006)
28. ★ "An Integrated Head for Optically Assisted (Hybrid) Magnetic Recording" PI: J.A. Bain, Co PI: T.E. Schlesinger, NSF, \$270,000, (2001-2004)
29. ★ "Development Of Disk-Like Sputtered Tape Media" PI J.A. Bain, Co-PI: D.E. Laughlin, National Storage Industry Consortium (NSIC). \$240,000 (March 2000-Feb 2004)
30. ★ "Understanding Deposition Kinetics In FeXN Sputtered Films," PI J.A. Bain, Seagate and NIST (through the ATP Program). \$202,968. (Jun 1999-Sep 2000)

31. ★ “Proposal for Acquisition of a Chemical Mechanical Polishing System for the Purpose of Adding Planarization Capability to the Existing Advanced Thin Film Devices Prototyping Facility at Carnegie Mellon University” PI: J.A. Bain, NSF \$200,000. (Nov 1999 - Nov 2000)
32. “A Thin Film Deposition System for Storage Device Prototyping,” PI: R.M. White, Co-PI: J.A. Bain, NSF \$600,000., (Jul 1998 – Jul 1999).
33. “Ultra-High Density Cache for Low Power Communications,” PI: G. Fedder, Co-PI: J.A. Bain, DARPA, \$3,393,166, (Jun 1998 – Jun 2001).
34. ★ “Frontiers of Magnetic Recording: Write Head Materials and Device Fabrication,” PI: J.A. Bain, NSIC/NSF, \$354,000 (Nov 1998 – Nov 2001)
35. ★ “Focused Ion Beam Etching: Development of Processes for Thin Film Head Trimming,” Grant from DSSC Industrial Consortium, P.I. J.A. Bain, \$160,000 (Jan 1998- Jan 2002)
36. ★ “Experimental Evaluation of Rise Time and Viscosity Effects in High Density Recording,” National Storage Industry Consortium (NSIC) grant, PI: J.A. Bain, \$25K (Sep 1997- Mar 1998)
37. ★ “Single Channel System Development Spin Valve Tape Heads,” Grant from DSSC Industrial Consortium, PI: J.A. Bain, \$200,000, (Jan 1997 – Jan 2002)
38. ★”Tape Systems Integration,” Source: Grant from DSSC Industrial Consortium, PI: J.Bain, \$80,000 (Jan 1997 – Jan 1999)
39. ★ “High Frequency Permeability Measurements of Fe Nitride Laminated Pole Materials,” Grant from DSSC Industrial Consortium, PI: J.A. Bain \$25K, (Jan 1997-June 1997).

PROFESSIONAL SERVICE AND PARTICPATION

PROFESSIONAL ACTIVITIES AND SERVICE
1. Associate Director, Data Storage Systems Center, 2005-present
2. University Laser Safety Committee, 2010-2012
3. Editorial board, Magnetics, IEEE Transactions on , 2001-present
4. National Research Council Board on Assessment of NIST, 2004-2008
5. University Radiation Safety Committee: 1999-2009, vice-chair 2001, chair 2002
6. Member: IEEE Magnetics Society
7. Member: IEEE Electron Devices Society
8. Referee: J. Appl. Phys, Appl. Phys Lett., Phys. Rev. Lett., Magnetics, IEEE Transactions on Mag, MRS Symp. Proc., Dutch Technology Foundation, JMEMS
9. Session Chair, The Magnetic Recording Conference, August 2015, Minneapolis, MN
10. Session Chair, The Magnetic Recording Conference, July 2008, Singapore
11. Session Chair, Intermag, May 2008, Madrid, Spain
12. MORIS Workshop 2007, Steering Committee Chair, Sep 2007, Pittsburgh PA
13. Session Chair, 10th Joint Intermag/MMM, Jan 2007, Tampa FL.
14. Co-organizer, International Probe Storage Workshop, Nov 2006
15. Program Co-Chair: The Magnetic Recording Conference, 2005 Pittsburgh PA
16. Technical Program Committee, 3rd Int’l Probe Storage Workshop, Zurich, March 2005
17. Sigma Xi Membership Secretary, Carnegie Mellon Chapter, 2003 – 2005
18. Publications Chair, Intermag 2004, Anaheim CA
19. Technical Program Committee, 2nd Int’l Probe Storage Workshop, Pittsburgh, PA, Nov 2002
20. Co-organizer, Connexions Probe Storage Workshop, Twente, Netherlands, May, 2002
21. Co-Editor, Proceedings of Intermag 2002
22. Scientific Program Committee, Intermag 2002
23. NSIC Tape Roadmap Heads Technology Team, 2001
24. Session chair, Joint Intermag/MMM 2001, conference, San Antonio, TX, Jan 2001
25. Graduate Education Committee Dept of ECE, CMU 1996-1999
26. Undergraduate Studies Committee, Dept of ECE, CMU: 1999-2001
27. Facilities Committee, Dept of ECE, CMU 1999-2000

28. Leader Heads Recording Activity: DSSC, CMU (2002-2012)
29. Leader Tape Recording Thrust: DSSC, CMU (1995-2001)
30. NSIC Tape Roadmap Executive Committee, 1997-1998
31. Co-organizer, MRS Symposium L: Materials for Data Storage, San Francisco, CA, Apr. 1998 (1997-1998)
32. Poster Session Chair, TMRC' 95, Pittsburgh PA 1995.

AWARDS
1. IEEE Senior Member, 2012
2. NSIC "Ironman" Award (Service Award) 2001-2002
3. National Science Foundation Graduate Fellowship, 1988-1991
4. IBM Graduate Fellowship, 1991
5. National Merit Scholarship, 1984