Thomas Mozdzen

(last updated November 8, 2019)

Contact Details:

School:
Arizona State University, ISTB4
781 E. Terrace Rd.
Tempe, Arizona, 85287
Phone: 480-236-2311
Email: tmozdzen@asu.edu

Home:
1532 W. Sherri Dr.
Gilbert, Az. 85233
Phone: 480-236-2311
Email: tjmozdzen@gmail.com

Education:

Arizona State University

2017: PhD Astrophysics. Thesis advisor: Professor Judd Bowman.

University of Texas at Dallas

1985: MS Physics

University of Illinois, Champaign-Urbana

1980: MS Electrical Engineering. Thesis title: "Characterization of a Hypocycloidal Plasma Pinch Device." Thesis advisor: Professor Kyekyoon Kim.

1978: BS Physics

2008 Dean's Fellowship Award: ASU's Fulton School of Engineering and the Department of Electrical Engineering. Declined.

2011 University Graduate Fellowship Award: ASU's School of Earth and Space Exploration. Accepted

Invited to the Electrical Engineering honor society HKN.

Invited to the Phi Kappa Phi honor society. (joined).

Other Academic Experience:

Low Frequency Array (LOFAR) training during the summer 2014 in Bremen, Germany. Reduced LOFAR raw data using the current LOFAR tool suite to produce clean images of target objects.

Professional Societies: APS, AAS, Senior Member IEEE

Employment:

Arizona State University, Tempe, Az., 2018-present: Postdoctoral Research Scholar

Research Project: Working on the 20 K low noise amplifier to room temperature amplifier path of the **GUSTO** (Galactic/Extragalactic Ultra-long-duration-balloon-borne Spectroscopic Terahertz Observatory) mission.

Arizona State University, Tempe, Az., 2011-2017: Graduate Student in Astrophysics

Thesis Topic: Antenna Design and Foreground Characterization for Improved Detection of the Redshifted 21 cm Global Signature During the Epoch of Reionization

Arizona State University, Tempe, Az., 2008-2011: Research Professional.

Developed tamper resistant ICs, radiation hardened flip-flops, and circuit synthesis methodologies for radiation hardened systems.

Arizona State University, Tempe, Az., 2007: Instructor in the Electrical Eng. Dept.

Instructor: VLSI Design (EEE 425), a senior level undergraduate class, 99 students.

Intel Corporation, Chandler, Az., 1988-2008

2006-2008. Principal Engineer. X86 Laptop Mobility Group focused on power reduction.

2000-2006. Principal Engineer. Handheld Processor Group (ARM based CPUs).
Design Manager for Custom Memories.
Individual contributor defining next generation low power process attributes.

1997-2000 Circuit Design Engineer for the first implementation of the Itanium family of Intel Enterprise CPUs.

1994-1996 Dual Role of Package Design and I/O Buffer Design Engineer for the Pentium II CPU. All circuits worked flawlessly on first silicon.

1990-1996 Package Electrical Engineer. Responsible for the electrical performance of the package interface to Intel CPUs. Also designed many test chips which were needed for package reliability studies.

1988-1989 Circuit Design Engineer in the ASIC Group. Developed a 1um Standard Cell Library for use by external customers wishing to use Intel's process technology to design Application Specific Integrated Circuits (ASIC). Library cells all worked per advertised specifications.

Siemens Corporation, Munich. Germany, 1986-1988

1987-1988. Logic Circuit Design Engineer. Designed various circuits on an IC for television picture improvement processing via digital techniques.

1986-1987 Dynamic RAM (DRAM) Circuit Design Engineer. Designed circuits on a 4M DRAM. Part of a US team chosen to help Siemens enter the DRAM business.

Mostek Corporation, Dallas, Texas, 1980-1986

1980-1982. Reliability Physics Engineer. Designed and executed reliability studies of transistor gate oxides, metal line interconnects, and other facets of ICs to support the qualification of the process and memory devices as reliable.

1983-1986 Dynamic RAM (DRAM) Circuit Design Engineer. Designed circuits on a 256K DRAM with special features to be used as video memory. All circuits fully functional on first silicon.

Publications

Journal Papers:

Monsalve, Raul A.; Fialkov, Anastasia; Bowman, Judd D.; Rogers, Alan E. E.; **Mozdzen, Thomas J.**; Cohen, Aviad; Barkana, Rennan; Mahesh, Nivedita, "Results from EDGES High-Band. III. New Constraints on Parameters of the Early Universe", 2019, ApJ 875, 67M.

Mozdzen, T. J.; Mahesh, N.; Monsalve, R. A.; Rogers, A. E. E.; Bowman, J. D., "Spectral index of the diffuse radio background between 50 and 100 MHz," 2019, MNRAS, 483,4411M.

Bowman, Judd D.; Rogers, Alan E. E.; Monsalve, Raul A.; **Mozdzen, Thomas J.**; Mahesh, Nivedita, "Reply to Hills et al.," 2018, Nature, 564E, 35B

Monsalve, Raul A.; Greig, Bradley; Bowman, Judd D.; Mesinger, Andrei; Rogers, Alan E. E.; **Mozdzen, Thomas J.**; Kern, Nicholas S.; Mahesh, Nivedita, "Results from EDGES High-band. II. Constraints on Parameters of Early Galaxies," 2018, ApJ, 863, 11M.

Bowman, Judd D.; Rogers, Alan E. E.; Monsalve, Raul A.; **Mozdzen, Thomas J.**; Mahesh, Nivedita, "An absorption profile centred at 78 megahertz in the sky-averaged spectrum," 2019, Nature, 555, 67B.

Monsalve, Raul A., Rogers, Alan E. E., Bowman, Judd D., **Mozdzen, Thomas J.**, "Results from EDGES High-band. I. Constraints on Phenomenological Models for the Global 21 cm Signal," 2017, ApJ, 847, 64.

Monsalve, Raul A., Rogers, Alan E. E., Bowman, Judd D., **Mozdzen, Thomas J.**, "Calibration of The Edges High-band Receiver to Observe the Global 21-cm Signature from the Epoch of Reionization," 2017, ApJ, 835, 49.

T. J. Mozdzen, J. D. Bowman, R. A. Monsalve, and A. E. E. Rogers, "Improved Measurement of the Spectral Index of the Diffuse Radio Background Between 90 and 190 MHz," 2016, MNRAS, 464, 4995.

T. J. Mozdzen, J. D. Bowman, R. A. Monsalve, and A. E. E. Rogers, "Limits on Foreground Subtraction from Chromatic Beam Effects in Global Redshifted 21 cm Measurements," 2015, MNRAS, 455, 3890.

Monsalve, Raul A., Rogers, Alan E. E., **Mozdzen, Thomas J.,** Bowman, Judd D., "One-Port Direct/Reverse Method for Characterizing VNA Calibration Standards," 2015, Transactions on Microwave Theory and Techniques, 64, 8, 2631.

A. E. E. Rogers, J. D. Bowman, J. Vierinen, R. Monsalve, and **T. Mozdzen**, "Radiometric measurements of electron temperature and opacity of ionospheric perturbations," 2014, *Radio Science*, 50, 130

S. Shambhulingaiah, L. T. Clark, **T. J. Mozdzen**, N. D. Hindman, S. Chella, and K. E. Holbert, "Temporal sequential logic hardening by design with a low power delay element," in *Proc. 12th Eur. Conf. Radiation and Its Effects on Components and Systems*, Sep. 19–23, 2011, pp. 144–149.

B. Matush, **T. Mozdzen**, L. Clark and J. Knudsen, "Area-efficient temporally hardened by design flip-flop circuits," *IEEE Trans. Nucl Sci.*, vol. 57, no. 6, pp. 3588-35-95, Dec. 2010.

D. Singh, J. M. Rabaey, M. Pedram, F. Catthoor, S. Rajgopal, N. Sehgal, and **T. J. Mozdzen**, "Power conscious CAD tools and methodologies: A perspective," *Proc. of the IEEE*, 83(4), pp. 570-593, 1995.

Presented Papers:

T. Mozdzen, J. Bowman, A. E. E. Rogers, R. Monsalve, “Preliminary Results of Spectral Index and Ionosphere Measurements with the EDGES Blade Antenna,” URSI, Jan 2016.

T. Mozdzen, J. Bowman, A. E. E. Rogers, R. Monsalve, “Evaluation of Terrestrial Sites for Global EOR Signal Detection via the RMS Error Metric of a Sky-Beam Convolution Polynomial Fit,” URSI, July 2015.

Q. K. Zhu, J. Yong and **T. Mozdzen**, “Decoupling Capacitance Study and Optimization Method for High-Performance VLSIs,” *IEEE DDECS*, pp. 388-392, 2010.

Mozdzen, T., et al., Panel Discussion: “Noise and Signal Integrity in Deep Submicron Design” *Proc. 34th DAC,* pp.720-721, 1997.

T. Mozdzen, “On-chip di/dt Noise Management Using Synergistic Die, Package, and Board Level Techniques,” *Workshop on Low Voltage and Low Power Technologies*, ASU, Tempe, Az., December 9, 1994.

T. Mozdzen, “Design Methodology for A 1.0 um Cell-Based Library Efficiently Optimized for Speed and Area,” *Proc. of the IEEE International ASIC Conference and Exhibit*, pp. P12-3.1–3.5, 1990.

F. Whiteside, R. Sittig, T. Mozdzen, "A Dual-Port 65 ns 64Kx4 DRAM with a 50 MHz Serial Output", *IEEE Intl. Solid State Circuits Conf.*, pp.48-49, Feb., 1986.

T. Mozdzen, J. Mize, "Thin-oxide Evaluation with the Fowler-Nordheim Characteristic," *IBM Dielectric Symposium*, 1984.

D. Fisch, T. Mozdzen, G. Roberts, "The Effect of Entrapped Krypton 85 Gas upon Device Reliability," *IEEE IRPS*, 1983. Received The **"Outstanding Paper"** Award.
Yu-Pin Han, J. Mize, T. Mozdzen, T. O'Keefe, J. Pinto, R. Worley, "Thin-oxide Evaluation with the Fowler-Nordheim Characteristic," *IEEE Intl. Electron Devices Meeting*, 1982.

Internal Intel Publications:

Invited Talk: "Mobile Power Density: Methodology, Trends, and Implications," Intel Design and Test Technology Conference (DTTC) August, 2007.

“Process Requirements for Ultra Low Power Handheld Devices,” Internal Intel Conference, December 2005.

“PV Methods for Low Power Products Employing Dynamic Voltage Management (DVM),” DTTC 2004.

“Low Power SRAM Techniques for Handheld Products,” DTTC 2004.

“A Dense Low Power Embedded 512Kbit SRAM in 0.13um CMOS,“ Internal Intel publication, Jan 2002.

The Unfavorable Statistics of Dynamic Bus Inversion to Save Power,” Internal Intel pub., Mar 2000.

“Management of Power Supply Noise using Die, Package, and Board Level Solutions,” Intel Technology Journal, Fall 1995.

Patents:

PAT. NO.	Title and Date
7,289,382	Rewritable fuse memory, Oct. 2007.
6,903,581	Output buffer for high and low voltage bus, June 2005.
6,512,401	Output buffer for high and low voltage bus, Jan. 2003
6,493,935	Interleaving a bondwire between two bondwires coupled to a same terminal, Mar. 2002.
6,440,770	Integrated circuit package, Mar. 2002.
6,266,793	JTAG boundary scan cell with enhanced testability feature, July 2001.
6,247,136	Method and apparatus for capturing data from a non-source synchronous component in a source synchronous environment, June 2001.
6,051,890	Interleaving a bondwire between two bondwires coupled to a same terminal, April 2000.
6,043,559	Integrated circuit package which contains two in plane voltage busses and a wrap around conductive strip that connects a bond finger to one of the busses, Mar. 2000.
6,031,283	Integrated circuit package, Feb. 2000.
6,020,631	Method and apparatus for connecting a bondwire to a bondring near a via, Feb. 2000.
5,787,575	Method for plating a bond finger of an integrated circuit package, Aug. 1998.
5,774,001	Method for eliminating multiple output switching timing skews in a source synchronous design, June 1998.
5,726,860	Method and apparatus to reduce cavity size and the bondwire length in three tier PGA packages by interdigitating the VCC/VSS, Mar. 1998.
5,723,995	Method for eliminating process variation timing skews in a source synchronous design, Mar. 1998.
5,706,484	Method for eliminating transition direction sensitive timing skews in a source synchronous design, Jan. 1998.
5,537,656	Method and apparatus for a microprocessor to enter and exit a reduced power consumption state, July 1996.

Outreach Activities:

1995-2000: Presented "Engineering Week" material which introduced grade school children to the career of Engineering. Made repeat class visits on multiple days to organize a tower construction project using marshmellows and raw spaghetti noodles.

1995, 1998, and 2009: Taught a 3 hr introduction to binary math and logic concepts to 4th grade, 6th grade, and 10th grade students. Goal was to teach the students how computers calculate and make logic decisions.

2013: Presented an introduction to galaxies and basic cosmology concepts to 7th and 8th grade students.

Participated in many public outreach star parties, including the annual Grand Canyon Star Party. Organized telescope viewing sessions of lunar eclipses for a local elementary school on multiple occasions. 2000-2015

President-elect of the East Valley Astronomy Club 2018 to 2019 term

Other Activities:

1996-2008: Technical Chair in 2007 for Intel's largest annual technical meeting of over 1000 engineers and over 200 papers and presentations. Member of organizing committee from 2000-2008. Organized review committees for topic areas, reviewed papers, coached talk rehearsals, and set guidelines for conference submissions.

2008-2010: Refereed papers submitted to the IEEE ICAS journal.

2000-2001: Reviewer for IEEE Spectrum invited articles.

2000-2007: Member of Toastmasters International. Achieved Advanced Communicator Award (silver).a

References:

Professor Judd Bowman
Arizona State University, ISTB4
781 E. Terrace Rd.
Tempe, Arizona, 85287
Phone: 480-965-8880
Email: Judd.Bowman@asu.edu

Mr. Larry Starr
VP Engineering
Lumense, Inc.
Atlanta, Georgia
Email: LEStarr@comast.net