

ADRIAN ILDEFONSO

CURRICULUM VITAE

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Research Interests

- Radiation effects in electronic devices, circuits and systems
- Extreme-environment operation of electronic devices, circuits and systems
- Using design techniques to mitigate effects of radiation on electronic systems
- Designing robust electronic systems for spatially-constrained applications (e.g., CubeSats)
- Developing miniaturized scientific instruments for next-generation CubeSats and Small Sats

Education

PhD in Electrical and Computer Engineering May 2017 – May 2020 (Expected)

Georgia Institute of Technology – GPA: 4.0 / 4.0

Dissertation: “Characterization and Mitigation of Single-Event Effects in RF Circuits and Systems”

Advisor: Dr. John D. Cressler

MS in Electrical and Computer Engineering

August 2014 – May 2017

Georgia Institute of Technology – GPA: 4.0 / 4.0

Thesis: “An Assessment of Complementary Silicon-Germanium BiCMOS Technologies for Extreme Environment Applications”

Advisor: Dr. John D. Cressler

BS in Computer Engineering

August 2009 – May 2014

University of Puerto Rico – Mayagüez Campus – GPA: 4.0 / 4.0

- Stefani Rafucci Award (Highest Honor at UPRM)
- Computer Engineering Department Award
- Faculty of Engineering Award

Research Experience

Graduate Research Assistant – SiGe Devices and Circuits Team

August 2014 – Present

Georgia Institute of Technology

Atlanta, GA

- Currently studying the effects of radiation on electronic devices, circuits, and systems, with a focus on RF systems
- Designed schematic and layout of DC and AC test structures, analog circuits, and various RF circuits using Cadence Virtuoso including ultra-wide temperature bandgap reference circuits, current-feedback amplifiers, operational amplifiers, low noise amplifiers, mixers, and RF power detectors
- Completed over ten tapeouts in most major Silicon Germanium (SiGe) platforms including GlobalFoundries’ 8HP and 9HP, Jazz SBC18H3, and IHP SG25H3P
- Performed a variety of RF measurements including scattering parameters, linearity, load and source pull, and noise figure
- Characterized devices and circuits over a wide temperature range, using closed and open cycle cryostats, down to 77K
- Developed TCAD models for multiple platforms of SiGe HBTs to simulate radiation effects at the device, circuit, and system level through the use of mixed-mode simulations
- Have overseen the planning and execution of off-site radiation experiments utilizing different sources
- Have accumulated over 1,000 hours of radiation effects testing across several facilities including:
 - Naval Research Laboratory (two-photon absorption laser and total dose using X-rays)
 - Lawrence Berkeley National Laboratory (heavy-ion broadbeam)
 - Vanderbilt University (total dose using X-rays)
 - Argonne National Laboratory (microbeam X-rays)
 - Grand Accélérateur National d’Ions Lourds (GANIL) in Caen, France (heavy-ion broadbeam)
 - GSI Helmholtz Centre for Heavy Ion Research in Darmstadt, Germany (heavy-ion microbeam)

Undergraduate Research (SURE Program)*Georgia Institute of Technology*

Summer 2012

Atlanta, GA

- Developed and calibrated TCAD models to study the effect of radiation on n-type MOSFETs
- Measured DC transfer and output characteristics of n-type MOSFETs over temperature (from 77K to 300K)

Undergraduate Research*University of Puerto Rico – Mayagüez Campus*

January 2012 – May 2014

Mayagüez, PR

- Designed custom layout for annular transistor DC structures using Cadence Virtuoso
- Wrote software to automate the characterization of DC test structures and extracting various device parameters

Teaching And Mentoring Experience

Courses Taught**Instructor of Record GT Freshman Seminar (GT1000)***Georgia Institute of Technology*

Fall 2019

Atlanta, GA

- Discussion of topics related to academic, social and professional success including learning styles, time management, major and career exploration, leadership and teamwork.

Instructor of Record - GTA Preparation Course (CETL8000)*Georgia Institute of Technology*

Fall 2019

Atlanta, GA

- This course is an introduction to the procedural information and practical skills needed to be an effective graduate teaching assistant. Students are introduced to different instructional techniques and strategies they can implement in their teaching assignments.

Guest Lecturer - Intro to the Microelectronics and Nanotechnology Revolution (CoE3002)*Georgia Institute of Technology*

Fall 2018

Atlanta, GA

- Introduced engineering students to basic semiconductor physics concepts including energy bandgap, carrier densities, and effective mass approximation

Graduate Teaching Assistant - Instrumentation and Electronics Lab (ECE3741)*Georgia Institute of Technology*

Fall 2014/Spring 2015

Atlanta, GA

- Basic analog and digital electronic circuits and principles. Techniques of electrical and electronic measurements with laboratory instruments. Intended for non-ECE engineering students.
- Designed and graded quizzes, tests and laboratory experiments to verify students' understanding of the material

CIOS Evaluations (Georgia Tech)

Sem. Taught	Course No. and Name	Enrolled	Responded	Avg. Score for "Instructor Overall Effectiveness"
Fall 2019	CETL 8000 - GTA Preparation	40	28	4.9
Fall 2019	GT1000 - GT Freshman Semnar	20	10	4.8

Administrative Experience

Laboratory Manager – SiGe Devices and Circuits Team*Georgia Institute of Technology*

May 2016 – May 2017

Atlanta, GA

- Managed laboratory equipment and oversaw day-to-day operations of a graduate research lab with 20 students
- Interfaced with industry sponsors for a variety of research needs
- Handled equipment purchase and repairs worth > \$20K

Honors and Awards

- Outstanding Conference Paper Award - 2019 IEEE Nuclear and Space Radiation Effects Conference
- Outstanding Conference Paper Award and Outstanding Student Paper Award - 2018 IEEE Nuclear and Space Radiation Effects Conference
- Georgia Tech Leadership Fellow 2018

- NSF-Funded ASSIST Travel Grant to participate in the LEVERAGE program at the 2018 SACNAS Conference
- IEEE NPSS Paul Phelps Continuing Education Grant 2018
- IEEE NPSS Graduate Scholarship 2018
- NextProf Participant at University of Michigan 2017
- Science Alliance Leadership Training (SALT) Fellow of the New York Academy of Sciences 2017
- National Science Foundation Graduate Research Fellow 2015
- Goizueta Foundation Fellow 2015, 2017
- GEM Fellow 2014
- Best Presentation Award – Industrial Affiliates Program Research Presentations (April 2013)
- Georgia Institute of Technology FOCUS Scholar (2012, 2014)
- Verizon Foundation Scholar (2010 – 2014)

Publications

Refereed Journal Publications

1. A. Cardoso, A. Omprakash, P. Chakraborty, N. Karaulac, D. Fleischhauer, **A. Ildefonso**, S. Zeinolabedinzadeh, M. Oakley, T. Bantu, N. Lourenco, J. Cressler, "On the Cryogenic RF Linearity of SiGe HBTs in a Fourth-Generation 90-nm SiGe BiCMOS Technology," *IEEE Trans. Electron Devices*, vol. 62, no. 4, pp. 1127–1135, Apr. 2015.
2. Z. Fleetwood, N. Lourenco, **A. Ildefonso**, T. England, I. Song, R. Schmid, A. Cardoso, S. Jung, N.-H. Roche, A. Khachatryan, S. Buchner, D. McMorrow, J. Warner, P. Paki, J. Cressler, "An Investigation of the SET Response of Devices and Differential Pairs in a 32-nm SOI CMOS Technology," *IEEE Trans. Nucl. Sci.*, vol. 62, no. 6, pp. 2643–2649, Dec. 2015.
3. C. T. Coen, A. C. Ulusoy, P. Song, **A. Ildefonso**, M. Kaynak, B. Tillack, J. D. Cressler, "Design and On-Wafer Characterization of G -Band SiGe HBT Low-Noise Amplifiers," *IEEE Trans. Microw. Theory Techn.*, vol. 64, no. 11, pp. 3631–3642, Nov. 2016.
4. N. E. Lourenco, S. Zeinolabedinzadeh, **A. Ildefonso**, Z. E. Fleetwood, C. T. Coen, I. Song, S. Jung, F. Inanlou, N. J.-H. Roche, A. Khachatryan, D. McMorrow, S. P. Buchner, J. H. Warner, P. Paki, J. D. Cressler, "An Investigation of Single-Event Effect Modeling Techniques for a SiGe RF Low-Noise Amplifier," *IEEE Trans. Nucl. Sci.*, vol. 63, no. 1, pp. 273–280, Feb. 2016.
5. Z. E. Fleetwood, N. E. Lourenco, **A. Ildefonso**, J. H. Warner, M. T. Wachter, J. M. Hales, G. N. Tzintzarov, N. J.-H. Roche, A. Khachatryan, S. P. Buchner, D. McMorrow, P. Paki, J. D. Cressler, "Using TCAD Modeling to Compare Heavy-Ion and Laser-Induced Single Event Transients in SiGe HBTs," *IEEE Trans. Nucl. Sci.*, vol. 64, no. 1, pp. 398–405, Jan. 2017.
6. **A. Ildefonso**, N. E. Lourenco, Z. E. Fleetwood, M. T. Wachter, G. N. Tzintzarov, A. S. Cardoso, N. J.-H. Roche, A. Khachatryan, D. McMorrow, S. P. Buchner, J. H. Warner, P. Paki, M. Kaynak, B. Tillack, J. D. Cressler, "Single-Event Transient Response of Comparator Pre-Amplifiers in a Complementary SiGe Technology," *IEEE Trans. Nucl. Sci.*, vol. 64, no. 1, pp. 89–96, Jan. 2017, [Nominated for the Outstanding Student Paper Award at the 2016 Nuclear and Space Radiation Effects Conference](#).
7. **A. Ildefonso**, I. Song, G. N. Tzintzarov, Z. E. Fleetwood, N. E. Lourenco, M. T. Wachter, J. D. Cressler, "Modeling Single-Event Transient Propagation in a SiGe BiCMOS Direct-Conversion Receiver," *IEEE Trans. Nucl. Sci.*, vol. 64, no. 8, pp. 2079–2088, Aug. 2017.
8. N. E. Lourenco, Z. E. Fleetwood, **A. Ildefonso**, M. T. Wachter, N. J.-H. Roche, A. Khachatryan, D. McMorrow, S. P. Buchner, J. H. Warner, H. Itsuji, D. Kobayashi, K. Hirose, P. Paki, A. Raman, J. D. Cressler, "The Impact of Technology Scaling on the Single-Event Transient Response of SiGe HBTs," *IEEE Trans. Nucl. Sci.*, vol. 64, no. 1, pp. 406–414, Jan. 2017, [Nominated for the Outstanding Student Paper Award at the 2016 Nuclear and Space Radiation Effects Conference](#).
9. A. Omprakash, Z. Fleetwood, U. Raghunathan, **A. Ildefonso**, A. Cardoso, N. Lourenco, J. Babcock, R. Mukhopadhyay, E. X. Zhang, D. Fleetwood, J. Cressler, "Total Ionizing Dose Effects on a High-Voltage ($\geq 30V$) Complementary SiGe on SOI Technology," *IEEE Trans. Nucl. Sci.*, vol. 64, no. 1, pp. 277–284, Jan. 2017.
10. I. Song, M. K. Cho, M. A. Oakley, **A. Ildefonso**, I. Ju, S. P. Buchner, D. McMorrow, P. Paki, J. D. Cressler, "On the Application of Inverse-Mode SiGe HBTs in RF Receivers for the Mitigation of Single-Event Transients," *IEEE Trans. Nucl. Sci.*, vol. 64, no. 5, pp. 1142–1150, May 2017.

11. Z. E. Fleetwood, **A. Ildefonso**, G. N. Tzintzarov, B. Wier, U. Raghunathan, M. K. Cho, I. Song, M. T. Wachter, D. Nergui, A. Khachatrian, J. H. Warner, P. McMarr, H. Hughes, E. Zhang, D. McMorrow, P. Paki, A. Joseph, V. Jain, J. D. Cressler, "SiGe HBT Profiles With Enhanced Inverse-Mode Operation and Their Impact on Single-Event Transients," *IEEE Trans. Nucl. Sci.*, vol. 65, no. 1, pp. 399–406, Jan. 2018.
12. J. M. Hales, A. Khachatrian, S. Buchner, N. J.-H. Roche, J. Warner, Z. E. Fleetwood, **A. Ildefonso**, J. D. Cressler, V. Ferlet-Cavrois, D. McMorrow, "Experimental Validation of an Equivalent LET Approach for Correlating Heavy-Ion and Laser-Induced Charge Deposition," *IEEE Transactions on Nuclear Science*, vol. 65, no. 8, pp. 1724–1733, Aug. 2018.
13. **A. Ildefonso**, C. T. Coen, Z. E. Fleetwood, G. N. Tzintzarov, M. T. Wachter, A. Khachatrian, D. McMorrow, J. H. Warner, P. Paki, J. D. Cressler, "Utilizing SiGe HBT Power Detectors for Sensing Single-Event Transients in RF Circuits," *IEEE Trans. Nucl. Sci.*, vol. 65, no. 1, pp. 239–248, Jan. 2018.
14. N. E. Lourenco, **A. Ildefonso**, G. N. Tzintzarov, Z. E. Fleetwood, K. Motoki, P. Paki, M. Kaynak, J. D. Cressler, "Single-Event Upset Mitigation in a Complementary SiGe HBT BiCMOS Technology," *IEEE Trans. Nucl. Sci.*, vol. 65, no. 1, pp. 231–238, Jan. 2018.
15. P. S. Goley, G. N. Tzintzarov, S. Zeinolabedinzadeh, **A. Ildefonso**, K. Motoki, R. Jiang, E. X. Zhang, D. M. Fleetwood, L. Zimmermann, M. Kaynak, S. Lischke, C. Mai, J. D. Cressler, "Total Ionizing Dose Effects in 70-GHz Bandwidth Photodiodes in a SiGe Integrated Photonics Platform," *IEEE Trans. Nucl. Sci.*, vol. 66, no. 1, pp. 125–133, Jan. 2019.
16. **A. Ildefonso**, Z. E. Fleetwood, G. N. Tzintzarov, J. M. Hales, D. Nergui, M. Frounchi, A. Khachatrian, S. P. Buchner, D. McMorrow, J. H. Warner, J. Harms, A. Erickson, K. Voss, V. Ferlet-Cavrois, J. D. Cressler, "Optimizing Optical Parameters to Facilitate Correlation of Laser- and Heavy-Ion-Induced Single-Event Transients in SiGe HBTs," *IEEE Trans. Nucl. Sci.*, vol. 66, no. 1, pp. 359–367, Jan. 2019, [Received Outstanding Student Paper Award and Outstanding Conference Paper Award at the 2018 Nuclear and Space Radiation Effects Conference](#).
17. A. P. Omprakash, **A. Ildefonso**, Z. E. Fleetwood, G. N. Tzintzarov, A. S. Cardoso, J. A. Babcock, R. Mukhopadhyay, A. Khachatrian, J. H. Warner, D. McMorrow, S. P. Buchner, J. D. Cressler, "The Effects of Temperature on the Single-Event Transient Response of a High-Voltage (> 30 V) Complementary SiGe-on-SOI Technology," *IEEE Trans. Nucl. Sci.*, vol. 66, no. 1, pp. 389–396, Jan. 2019.

Refereed Journal Papers in Press or Under Review

1. **A. Ildefonso**, N. E. Lourenco, G. N. Tzintzarov, Z. E. Fleetwood, A. Khachatrian, S. P. Buchner, D. McMorrow, J. H. Warner, M. Kaynak, J. D. Cressler, "Tradeoffs Between RF Performance and SET Robustness in Low-Noise Amplifiers in a Complementary SiGe BiCMOS Platform," *IEEE Trans. Nucl. Sci.*, Under Review.
2. J. M. Hales, A. Khachatrian, S. Buchner, J. H. Warner, **A. Ildefonso**, G. N. Tzintzarov, D. Nergui, D. M. Monahan, S. D. LaLumondiere, B. Lotshaw, J. D. Cressler, D. McMorrow, "New Approach for Pulsed-Laser Testing That Mimics Heavy-Ion Charge Deposition Profiles," *IEEE Trans. Nucl. Sci.*, Accepted, Pending Publication. [Received Outstanding Conference Paper Award at the 2019 Nuclear and Space Radiation Effects Conference](#).
3. J. M. Hales, A. Khachatrian, J. Warner, S. Buchner, **A. Ildefonso**, G. N. Tzintzarov, D. Nergui, D. M. Monahan, S. D. LaLumondiere, J. D. Cressler, D. McMorrow, "Using Bessel beams and two-photon absorption to predict radiation effects in microelectronics," *Opt. Express*, Accepted, Pending Publication.
4. **A. Ildefonso**, G. N. Tzintzarov, A. P. Omprakash, D. Nergui, P. S. Goley, J. M. Hales, A. Khachatrian, S. P. Buchner, J. H. Warner, D. McMorrow, J. D. Cressler, "Comparison of Single-Event Transients in SiGe HBTs on Bulk and Thick-Film SOI," *IEEE Trans. Nucl. Sci.*, Accepted, Pending Publication.
5. D. Nergui, **A. Ildefonso**, G. N. Tzintzarov, N. E. Lourenco, A. P. Omprakash, P. S. Goley, Z. E. Fleetwood, S. D. LaLumondiere, J. P. Bonsall, D. M. Monahan, H. Kettering, D. L. Brewster, J. D. Cressler, "Single-Event Transients in SiGe HBTs Induced by Pulsed X-Ray Microbeam," *IEEE Trans. Nucl. Sci.*, Accepted, Pending Publication.
6. G. N. Tzintzarov, **A. Ildefonso**, P. S. Goley, M. Frounchi, D. Nergui, S. G. Rao, J. Teng, J. Campbell, A. Khachatrian, S. P. Buchner, D. McMorrow, J. H. Warner, M. Kaynak, L. Zimmermann, J. D. Cressler, "Electronic-to-Photonic Single-Event Transient Propagation Analysis in a Segmented Mach-Zehnder Modulator in a Si/SiGe Integrated Photonics Platform," *IEEE Trans. Nucl. Sci.*, Accepted, Pending Publication.

Refereed Conference Proceedings

1. A. P. Omprakash, P. S. Chakraborty, H. Ying, A. S. Cardoso, **A. Ildefonso**, J. D. Cressler, "On the potential of using SiGe HBTs on SOI to support emerging applications up to 300°C", in *Bipolar/BiCMOS Circuits and Technology Meeting - BCTM, 2015 IEEE*, 2015, pp. 27–30.
2. **A. Ildefonso**, I. Song, Z. Fleetwood, N. E. Lourenco, M. T. Wachter, J. D. Cressler, "Modeling Single-Event Transient Propagation in a SiGe BiCMOS Direct-Conversion Receiver", Radiation Effects on Components and Systems (RADECS) Conference, 2016.
3. M. T. Wachter, **A. Ildefonso**, Z. Fleetwood, N. E. Lourenco, G. Tzintzarov, D. McMorrow, N. J.-H. Roche, A. Khachatryan, P. McMarr, H. Hughes, J. H. Warner, P. Paki, J. D. Cressler, "The Effects of Total Ionizing Dose on the Transient Response of SiGe BiCMOS Technologies", 2016 Radiation Effects on Components and Systems (RADECS) Conference, 2016.
4. C. T. Coen, **A. Ildefonso**, Z. E. Fleetwood, J. D. Cressler, "A 19–34 GHz SiGe HBT Square-Law Detector with Ultra Low 1/f Noise for Atmospheric Radiometers", Proc. European Microwave Integrated Circuits Conference, 2017, pp. 163–166.
5. **A. Ildefonso**, J. D. Cressler, "Radiation Hardening Strategies for SiGe-Based RF Communications Circuits and Systems", Proc. 2018 Government Microcircuit Applications and Critical Technology (GOMACTech) Conference, 2018.
6. A. P. Omprakash, **A. Ildefonso**, G. Tzintzarov, J. Babcock, R. Mukhopadhyay, J. D. Cressler, "Using SiGe-on-SOI HBTs to Build 300°C Capable Analog Circuits", in *2018 IEEE BiCMOS and Compound Semiconductor Integrated Circuits and Technology Symposium (BCICTS)*, Oct. 2018, pp. 206–209.

Refereed Conference Proceedings in Press or Under Review

1. H. Ying, J. W. Teng, G. N. Tzintzarov, A. P. Omprakash, S. G. Rao, U. Raghunathan, **A. Ildefonso**, S. Fernandez, J. D. Cressler, "DC and RF Variability of SiGe HBTs Operating Down to Deep Cryogenic Temperatures", [Awarded Best Student Paper](#), Proceedings of the 2019 IEEE BiCMOS, Compound Semiconductor Integrated Circuits, and Technology Symposium, 2019, In Press.

Refereed Conference Papers and Presentations With A Short Abstract (No Formal Proceedings)

1. Z. E. Fleetwood, N. E. Lourenco, **A. Ildefonso**, T. D. England, I. Song, R. Schmid, A. Cardoso, S. Jung, N. J.-H. Roche, A. Khachatryan, S. Buchner, D. McMorrow, J. Warner, P. Paki, J. D. Cressler, "Investigating the SEE Response of Devices and Differential Pairs in a 32-nm SOI CMOS Technology", Paper PC-8, 2015 IEEE Nuclear and Space Radiation Effects Conference, 2015.
2. Z. E. Fleetwood, N. E. Lourenco, **A. Ildefonso**, J. H. Warner, M. T. Wachter, J. M. Hales, G. N. Tzintzarov, N. J.-H. Roche, A. Khachatryan, S. P. Buchner, D. McMorrow, P. Paki, J. D. Cressler, "Using TCAD Modeling to Compare Heavy-Ion and Laser-Induced Single Event Transients in SiGe HBTs", Paper G-4, 2016 IEEE Nuclear and Space Radiation Effects Conference, 2016.
3. **A. Ildefonso**, N. E. Lourenco, Z. E. Fleetwood, M. T. Wachter, G. N. Tzintzarov, A. S. Cardoso, N. J.-H. Roche, A. Khachatryan, D. McMorrow, S. P. Buchner, J. H. Warner, P. Paki, M. Kaynak, B. Tillack, J. D. Cressler, "Single-Event Transient Response of Comparator Pre-Amplifiers in a Complementary SiGe Technology", Paper B-2, 2016 IEEE Nuclear and Space Radiation Effects Conference, 2016.
4. S. Jung, I. Song, Z. E. Fleetwood, **A. Ildefonso**, N. E. Lourenco, M. A. Oakley, N. J.-H. Roche, A. Khachatryan, D. McMorrow, S. P. Buchner, J. H. Warner, P. Paki, J. D. Cressler, "Radiation Hardening by Design of SiGe HBT Current-Mode Logic Circuits", Paper PF-5, 2016 IEEE Nuclear and Space Radiation Effects Conference, 2016.
5. N. E. Lourenco, Z. E. Fleetwood, **A. Ildefonso**, M. T. Wachter, N. J.-H. Roche, A. Khachatryan, D. McMorrow, S. P. Buchner, J. H. Warner, H. Itsuji, D. Kobayashi, K. Hirose, P. Paki, A. Raman, J. D. Cressler, "The Impact of Technology Scaling on the Single-Event Transient Response of SiGe HBTs", Paper G-5, 2016 IEEE Nuclear and Space Radiation Effects Conference, 2016.
6. A. Omprakash, Z. Fleetwood, U. Raghunathan, **A. Ildefonso**, A. Cardoso, N. Lourenco, J. Babcock, R. Mukhopadhyay, E. X. Zhang, D. Fleetwood, J. Cressler, "Total Ionizing Dose Effects on a High-Voltage ($\approx 30V$) Complementary SiGe on SOI Technology", 2016 IEEE Nuclear and Space Radiation Effects Conference, 2016.
7. Z. E. Fleetwood, **A. Ildefonso**, G. N. Tzintzarov, B. Wier, U. Raghunathan, M. K. Cho, I. Song, M. T. Wachter, D. Nergui, A. Khachatryan, J. H. Warner, P. McMarr, H. Hughes, E. Zhang, D. McMorrow, P. Paki, A. Joseph, V. Jain, J. D. Cressler, "SiGe HBT Profiles with Enhanced Inverse-Mode Operation to Mitigate Single-Event Transients", Paper G-3, 2017 IEEE Nuclear and Space Radiation Effects Conference, 2017.

8. J. M. Hales, A. Khachatrian, S. Buchner, N. J.-H. Roche, J. Warner, Z. E. Fleetwood, **A. Ildefonso**, J. D. Cressler, V. Ferlet-Cavrois, D. Mcmorrow, "Experimental Validation of an Equivalent LET Approach for Correlating Heavy-Ion and Laser-Induced Charge Deposition", Paper PE-2, 2017 Radiation Effects on Components and Systems (RADECS) Conference, 2017.
9. **A. Ildefonso**, C. T. Coen, Z. E. Fleetwood, G. N. Tzintzarov, M. T. Wachter, A. Khachatrian, D. Mcmorrow, J. H. Warner, P. Paki, J. D. Cressler, "Utilizing SiGe HBT Power Detectors for Sensing Single-Event Transients in RF Circuits", Paper D-6, 2017 IEEE Nuclear and Space Radiation Effects Conference, 2017.
10. N. E. Lourenco, **A. Ildefonso**, G. N. Tzintzarov, Z. E. Fleetwood, K. Motoki, P. Paki, M. Kaynak, J. D. Cressler, "Single-Event Upset Mitigation in a Complementary SiGe HBT BiCMOS Technology", Paper D-5, 2017 IEEE Nuclear and Space Radiation Effects Conference, 2017.
11. P. S. Goley, G. N. Tzintzarov, S. Zeinolabedinzadeh, **A. Ildefonso**, K. Motoki, R. Jiang, E. X. Zhang, D. M. Fleetwood, L. Zimmermann, M. Kaynak, S. Lischke, C. Mai, J. D. Cressler, "Total Ionizing Dose Effects in 70-GHz Bandwidth Photodiodes in a SiGe Integrated Photonics Platform", Paper B-5, 2018 IEEE Nuclear and Space Radiation Effects Conference, Jul. 2018.
12. **A. Ildefonso**, Z. E. Fleetwood, G. N. Tzintzarov, J. M. Hales, D. Nergui, M. Frounchi, A. Khachatrian, S. P. Buchner, D. Mcmorrow, J. H. Warner, J. Harms, A. Erickson, K. Voss, V. Ferlet-Cavrois, J. D. Cressler, "Optimizing Optical Parameters to Facilitate Correlation of Laser- and Heavy-Ion-Induced Single-Event Transients in SiGe HBTs", Paper H-3, 2018 IEEE Nuclear and Space Radiation Effects Conference, Jul. 2018.
13. A. P. Omprakash, **A. Ildefonso**, Z. E. Fleetwood, G. N. Tzintzarov, A. S. Cardoso, J. A. Babcock, R. Mukhopadhyay, A. Khachatrian, J. H. Warner, D. Mcmorrow, S. P. Buchner, J. D. Cressler, "The Effects of Temperature on the Single-Event Transient Response of a High-Voltage (> 30 V) Complementary SiGe-on-SOI Technology", Paper PH-3, 2018 IEEE Nuclear and Space Radiation Effects Conference, Jul. 2018.
14. J. M. Hales, A. Khachatrian, S. Buchner, J. H. Warner, **A. Ildefonso**, G. N. Tzintzarov, D. Nergui, J. D. Cressler, D. Mcmorrow, "New Approach for Pulsed-Laser Testing That Mimics Heavy-Ion Charge Deposition Profiles", Paper B-2, 2019 IEEE Nuclear and Space Radiation Effects Conference, Jul. 2019.
15. **A. Ildefonso**, N. E. Lourenco, G. N. Tzintzarov, Z. E. Fleetwood, A. Khachatrian, S. P. Buchner, D. Mcmorrow, J. H. Warner, M. Kaynak, J. D. Cressler, "Tradeoffs Between RF Performance and SET Robustness in Low-Noise Amplifiers in a Complementary SiGe BiCMOS Platform", Paper D-4, Radiation Effects on Components and Systems (RADECS) Conference, Sep. 2019.
16. **A. Ildefonso**, G. N. Tzintzarov, A. P. Omprakash, D. Nergui, P. S. Goley, J. M. Hales, A. Khachatrian, S. P. Buchner, J. H. Warner, D. Mcmorrow, J. D. Cressler, "Comparison of Single-Event Transients in SiGe HBTs on Bulk and Thick-Film SOI", Paper B-1, 2019 IEEE Nuclear and Space Radiation Effects Conference, Jul. 2019.
17. D. Nergui, **A. Ildefonso**, G. N. Tzintzarov, A. P. Omprakash, Z. E. Fleetwood, S. D. Lalumondiere, J. P. Bonsall, D. M. Monahan, H. Kettering, D. L. Brewe, J. D. Cressler, "Single-Event Transients in SiGe HBTs Induced by Pulsed X-Ray Microbeam", Paper B-3, 2019 IEEE Nuclear and Space Radiation Effects Conference, Jul. 2019.
18. G. N. Tzintzarov, **A. Ildefonso**, P. S. Goley, M. Frounchi, J. Campbell, A. Khachatrian, S. P. Buchner, D. Mcmorrow, J. H. Warner, M. Kaynak, L. Zimmermann, J. D. Cressler, "Electronic-to-Photonic Single-Event Transient Propagation Analysis in a Segmented Mach-Zehnder Modulator in a Si/SiGe Integrated Photonics Platform", Paper H-1, 2019 IEEE Nuclear and Space Radiation Effects Conference, Jul. 2019.

Presentations

Oral and Poster Presentations

1. **A. Ildefonso**, N. E. Lourenco, Z. E. Fleetwood, M. T. Wachter, G. N. Tzintzarov, A. S. Cardoso, N. J. H. Roche, A. Khachatrian, D. Mcmorrow, S. P. Buchner, J. H. Warner, P. Paki, M. Kaynak, B. Tillack, J. D. Cressler, "Single-Event Transient Response of Comparator Pre-Amplifiers in a Complementary SiGe Technology", oral presentation at 2016 *IEEE Nuclear and Space Radiation Effects Conference*, 2016.
2. **A. Ildefonso**, I. Song, Z. Fleetwood, N. E. Lourenco, M. T. Wachter, J. D. Cressler, "Modeling Single-Event Transient Propagation in a SiGe BiCMOS Direct-Conversion Receiver", poster presentation at 2016 *Radiation Effects on Components and Systems (RADECS) Conference*, 2016.
3. **A. Ildefonso**, C. T. Coen, Z. E. Fleetwood, G. N. Tzintzarov, M. T. Wachter, A. Khachatrian, D. Mcmorrow, J. H. Warner, P. Paki, J. D. Cressler, "Utilizing SiGe HBT Power Detectors for Sensing Single-Event Transients in RF Circuits", oral presentation at 2017 *IEEE Nuclear and Space Radiation Effects Conference*, 2017.

4. **A. Ildefonso**, J. D. Cressler, "TPA SEE Testing Procedures at NRL: from System Calibration to Experiment", oral presentation at *5th Workshop on Laser Testing of Radiation Effects on Components and Systems*, 2017.
5. **A. Ildefonso**, J. D. Cressler, "Radiation Hardening Strategies for SiGe-Based RF Communications Circuits and Systems", oral presentation at 2017 *GOMACTech Conference*, 2018.
6. **A. Ildefonso**, Z. E. Fleetwood, G. N. Tzintzarov, J. M. Hales, D. Nergui, M. Frounchi, A. Khachatryan, S. P. Buchner, D. Mcmorrow, J. H. Warner, J. Harms, A. Erickson, K. Voss, V. Ferlet-Cavrois, J. D. Cressler, "Optimizing Optical Parameters to Facilitate Correlation of Laser- and Heavy-Ion-Induced Single-Event Transients in SiGe HBTs", oral presentation at 2018 *IEEE Nuclear and Space Radiation Effects Conference*, 2018.
7. **A. Ildefonso**, G. N. Tzintzarov, D. Nergui, A. P. Omprakash, H. Ying, J. D. Cressler, "Silicon-Germanium Platforms: An Enabling Technology for Next-Generation Space Systems", poster presentation at the 2018 *Space Innovations Symposium*, 2018.
8. **A. Ildefonso**, J. D. Cressler, "Silicon-Germanium Platforms: An Enabling Technology for Next-Generation Space Systems", oral presentation at the 2019 *Exploration and Origins Colloquium*, 2019.
9. **A. Ildefonso**, G. N. Tzintzarov, N. E. Lourenco, Z. E. Fleetwood, A. Khachatryan, S. P. Buchner, D. McMorro, J. H. Warner, M. Kaynak, J. D. Cressler, "Tradeoffs Between RF Performance and SET Robustness in Low-Noise Amplifiers in a Complementary SiGe BiCMOS Platform", oral presentation at the 2019 *Radiation Effects on Components and Systems (RADECS) Conference*, Sep. 2019.
10. **A. Ildefonso**, G. N. Tzintzarov, A. P. Omprakash, D. Nergui, P. S. Goley, J. M. Hales, A. Khachatryan, S. P. Buchner, J. H. Warner, D. McMorro, J. D. Cressler, "Comparison of Single-Event Transients in SiGe HBTs on Bulk and Thick-Film SOI", oral presentation at the 2019 *IEEE Nuclear and Space Radiation Effects Conference*, Jul. 2019.

Invited Lectures and Seminars

1. **A. Ildefonso**, *Single-Event Effects in RF Circuits: How Tiny Lightning Strikes Can Wreak Havoc in Space Communications Systems*, Emerging Scholars in Engineering Lecture Series, Vanderbilt University, Nashville, TN, Dec. 2019.

Academic Service

- Journal Reviewer
 - IEEE Transactions on Nuclear Science
 - IEEE Electron Device Letters
 - IEEE Access
 - Nuclear Instruments and Methods in Physics Research
 - Microelectronics Reliability
- Conference Reviewer
 - Nuclear and Space Radiation Effects Conference (NSREC) (2019)
 - Radiation Effects on Components and Systems (RADECS) Conference (2016)
 - SACNAS Conference (2018, 2019)
- Scholarship Reviewer
 - SACNAS Conference Travel Scholarship for Undergraduates (2018, 2019)
 - Goizueta Fellowship at the Georgia Institute of Technology (2018, 2019)
 - Presidential Undergraduate Research Awards at the Georgia Institute of Technology (2018, 2019)
- Mentored three undergraduate research assistants in the SiGe Devices and Circuits Team
- Organized events and student volunteers for prospective graduate student visit

Professional Experience

Naval Research Enterprise Internship Program (NREIP)

Naval Research Laboratory

June 2018 – Aug 2018

Washington DC

- Performed two-photon absorption experiments and improved calibration procedure for laser system
- Performed TCAD simulations on GaN HEMTs

Naval Research Enterprise Internship Program (NREIP)

Naval Research Laboratory

June 2017 – Aug 2017

Washington DC

- Performed two-photon absorption experiments using a pulsed-laser system to emulate the effects of heavy ions on electronic devices and circuits
- Performed energy calibration and knife-edge measurements to determine beam spot size

Intern – Advanced Imaging Group

MIT Lincoln Laboratory

Summer 2014

Lexington, MA

- Performed testing on imaging circuits in order to characterize their performance
- Implemented test benches in an FPGA using VHDL in order to automate the test procedure

Webmaster – iap.ece.uprm.edu

University of Puerto Rico – Mayagüez Campus

August 2013 – May 2014

Mayagüez, PR

- Updated front-end and back-end to provide a better user experience
- Added features to maintain the administrative part of the program

Design Engineering Intern – Drivers and Load Switches Group

Texas Instruments

Summer 2013

Dallas, TX

- Designed a clamp to keep a load switch from turning on when there is a fast transient on the input
- Performed ESD simulations for various products under development which identified violations that were later fixed
- Wrote Python scripts to generate Verilog-a code needed for simulations and to parse the results

IT Intern (Developer/Programmer – IT Legal Team)

Verizon Wireless

Summer 2011

Bedminster, NJ

- Used Test Driven Development to build a template engine for a framework used to interview prospective developers
- Assisted in new-hire interviewing process for IT Legal Team Java developers

Skills

- **Languages:** Spanish and English (fully bilingual), French (intermediate)
- **Technical Languages:** HTML, CSS, Java, JavaScript, XML, Python, SQL, SPICE, PHP, VHDL, LaTeX, Matlab, C
- **Software Tools:** Eclipse IDE, LTSpice, NanoTCAD, Sentaurus, Cadence Virtuoso, Eagle CAD, Sonnet, ADS
- **Lab Techniques:** Packaging and wirebonding, wafer probing, DC device characterization, RF measurements (s-parameters, noise figure, linearity, source/load pull), over-temperature measurements, modeling of semiconductor devices, radiation experiments

Other Activities and Volunteer Work

- **ECE Graduate Student Organization** (Member 2015 – 2017, Vice President 2017 – 2018, President 2018 – 2019, Professional Development Chair 2019-Present)
- **IEEE** (Student Member 2012 – Present)
- **Focus Program (2015, 2016, 2017)** (Volunteer) – Activity geared towards encouraging underrepresented minority students to pursue graduate education
- **Annual Latino College and STEM Fair (2016, 2019)** (Volunteer) – Activity geared towards K-12 Hispanic/Latino students and their families where attendees can learn about different college majors and programs of study
- **Tau Beta Pi – PR Alpha Chapter** (Member 2012 – May 2014)
- **Star Program (2010, 2011, 2012, 2013)** (Volunteer) – Activity geared towards encouraging high school students to pursue a career in engineering
- **Engineering Workshop (2011, 2012)** (Volunteer) – Activity geared towards educating high school students on specific engineering disciplines
- **Eugene Francis Cup 2011, 2012** (Volunteer) – Math competition for high school students hosted at UPRM
- **IEEE Computer Society, IEEE Women In Engineering** (Student Member 2009 – 2014)