

Curriculum Vitae: Tomas Palacios

Citizenship: Spanish
US Permanent Resident
Birthdate: July 26, 1978
tpalacios@mit.edu
<http://web.mit.edu/tpalacios>
phone #: +1 (617) 324-2395

Assistant Professor of Electronics
Dept. of Electrical Engineering and Computer Science
Massachusetts Institute of Technology
77 Massachusetts Ave., Office 39-567B
Cambridge, MA 02139
FAX #: +1 (617) 253-9622

EDUCATION

Ph.D. in Electrical and Computer Engineering Feb. 2006
Electrical and Computer Engineering Department
University of California, Santa Barbara
Advisor: Prof. Umesh K. Mishra
Thesis: Optimization of the High Frequency Performance of
Nitride-based Transistors

Telecommunication Engineer (with Highest Honors) 2001
Escuela Técnica Superior de Ingenieros de Telecomunicación
Polytechnic University of Madrid (UPM), Madrid, Spain

HONORS AND AWARDS

National Science Foundation (NSF) CAREER Award July 2009

Office of Naval Research' Young Investigator Award March 2009

Best Presentation Award at the MIT Microsystems Annual Conference (two awards) Jan. 2009

Best Paper Award at the International Conference on Advances in Electronics and Microelectronics - 2008 Sept. 2008

DARPA Young Faculty Award March 2008

MIT Energy Initiative Grant January 2008

Buchsbaum Research Award Oct. 2007

MIT Deshpande Award March 2007

Advisor of the IEEE Electron Devices Society Masters Student Fellowship recipient, Xu Zhao. Xu got this award for his "outstanding M.Sc. work" on electric field engineering of GaN HEMTs. July 2007

UCSB Lancaster Award for “ <i>the best PhD Dissertation in Mathematics, Physical Sciences and Engineering at UCSB in the period 2004-2006</i> ”	June 2006
Best Student Paper Award at the 63 rd IEEE Device Research Conference (Santa Barbara, USA), June 2005	Feb. 2006
Nominated by the IEEE for the 2006 and 2007 “New Faces of Engineering” Recognition Program, which “ <i>highlights interesting and unique work of young engineers and the resulting impact on society</i> ”	Dec.2005/ Dec. 2006
Young Researcher Award at the 6 th International Conference on Nitride Semiconductors (Bremen, Germany)	Sept. 2005
European Prize Salva i Campillo , awarded by the Catalan Association of Telecommunication Engineers to the “ <i>most promising European newcomer to Engineering</i> ”	Feb. 2003
Best Master’s Thesis Award from the Spanish Association of Telecommunication Engineers: “ <i>Nanotechnology for High Frequency Devices in III-N Nitrides: Applications to MSM UV-Detectors, SAW Filters and HEMT Transistors</i> ”	2002
Best Undergraduate EECS Student Award from the Polytechnic University of Madrid	2000
Representative of Spain in the International Summer Student Fellowship at the <i>European Organization for Nuclear Research (CERN)</i>	2000
Representative of Spain in the 37th International Mathematical Olympiad held in Mumbai, India	July 1996
Gold Medal at the Spanish Mathematical Olympiad	Feb. 1996
High School Extraordinary Award awarded by the Spanish Education Ministry to the best students in Spain	Feb. 1996
International award: “Prämienprogramm zur Forderung der Ausbildung ausländischer Schüler in der deutschen Sprache. Internationales Preisträgerprogramm”, awarded by the German Ministry of Education	July 1995
First Award in the “Madrid Science Museum Competition”	June 1995
First Prize on the “Cisneros Research Award”	April 1993

RESEARCH EXPERIENCE

Materials: GaN, (In, Al)GaN, AlN, ZnO, Si, graphene

Processing of semiconductor devices:

- Photo and e-beam lithography
- Metalization (Thermal and e-beam evaporation, sputtering)
- Wet and dry etching (RIE and ICP)
- Wedge bonding

Experience on micro- and opto-electronic devices: Deep-submicron field effect transistors (HEMTs, MOSFETs, MESFETs), MSM photodetectors, ambipolar electronics, and surface acoustic wave (SAW) devices.

Characterization of semiconductor materials and devices:

- *Optical*: Ellipsometry, photoluminescence.
- *Structural*: EDS, Nomarsky, FIB, SEM and AFM microscopy.
- *Electrical*: I-V, C-f, C-V, Hall effect, RF and load-pull power, linearity and temperature dependent measurements.

Experience in radiation tolerance and reliability studies of electronic devices.

TEACHING EXPERIENCE

Assistant Professor in the EECS department of MIT	Since 2006
Collaboration in the elaboration of the syllabus of the course: “Digital Electronic Systems Laboratory”, Polytechnic University of Madrid, Spain.	1999-2000
Teaching assistant for the classes: “Digital Electronic Systems Laboratory” and “Electronic Circuits Laboratory”, Polytechnic University of Madrid, Spain.	1998-1999

PROFESSIONAL ACTIVITIES

- Member of the Program Committee of the International Electron Device Meeting since 2008. Organizer and chair of the Wide Bandgap Semiconductor Session.
- Member of the Technical Program Committee of the ESSDERC Conference since 2008
- Member of the Program Committee of the International Conference on Advances in Electronics and Micro-Electronics since 2008.
 - Advisory Chair of the International Conference on Advances in Electronics and Micro-Electronics since 2009.
- Member of the Program Committee of the Device Research Conference since 2007:

- Organizer of the Wide Bandgap Session in the 66th Device Research Conference
- Organizer and Chair of the Rump Session on “Multi-Terahertz Transistors” in the 66th Device Research Conference.
- Member of the Technical Program Committee of the International Conference for Nitride Semiconductors since 2007.
- Publication co-Chair and Guest Editor in the International Conference for Nitride Semiconductors (ICNS-7), Las Vegas, September 2007.
- Session chair in the Device Research Conference (Notre Dame University, 2007) and in the International Conference for Nitride Semiconductors (Las Vegas, 2007).
- Member of the MIT-Spain Scientific Committee and Advisory Board (2006-2008).
- Organizer of different activities to help MIT graduate student to apply to faculty positions.
- Referee in the journals:
 - IEEE Electron Device Letters
 - IEEE Trans. On Electron Devices
 - Electronic Letters
 - Applied Physics Letters
 - Journal of Materials Science: Materials in Electronics
 - Solid State Electronics
 - Applied Surface Science
 - Physica Status Solidi (a, b, c)
- Panelist and referee in several NSF-organized research and fellowship panels.
- Referee for the European Union and the Spanish Ministry of Science and Technology.
- Member of the IEEE, APS and MRS professional societies.

BOOKS AND BOOK CHAPTERS

- B1. T. Palacios, “*Nitride-based Devices for Energy Applications*”, chapter in “*Encyclopedia of Energy*”, edited by Dr. Jay Lehr, Wiley Interscience (2010).
- B2. T. Palacios and U. K. Mishra, “AlGa_N/Ga_N High Electron Mobility Transistors”, chapter in “*Semiconductor devices*” (tentative title) edited by Dr. Pallab Batthacharia, Elsevier (August 2008).
- B3. T. Palacios, “New structures for AlGa_N/Ga_N High Electron Mobility Transistors”, chapter in “*Advanced Semiconductors Materials and Devices Research: III-Nitrides and SiC*”, edited by Dr. Ho-Young Cha, Research Signpost, (October 2007).
- B4. T. Palacios and U. K. Mishra, “Modeling and Simulation of AlGa_N/Ga_N High Electron Mobility Transistors”, chapter in “*Nitride Semiconductor Devices. Principles and Simulation*” edited by J. Piprek., Wiley-VCH (March 2007).

PATENTS

- P1. “Method to fabricate III-N field effect transistors using ion implantation with reduced dopant activation and damage recovering temperature”. Inventors: L. S. McCarthy, U. K. Mishra, F. Recht, and T. Palacios. Patent pending (2008).
- P2. “New devices based on Si/Nitride structures”. Inventor: T. Palacios and J. W. Cheng, Patent pending (2007).
- P3. “Polarization-induced barriers for N-face nitride-based electronics”. Inventors: T. Palacios, M. H. Wong, S. Rajan and U. K. Mishra. Patent pending (2006).
- P4. “*Method for Fabricating Deep-Submicron Gates with Arbitrary Shapes for Transistors*”. Inventors: T. Palacios and U. K. Mishra. Patent pending (2005).
- P5. “*Fluorine Treatment to Shape the Electric Field in Electron Devices, Passivate Dislocations and Point Defects, and Enhance the Luminescence Efficiency of Optical Devices*”. Inventors: T. Palacios, L. Shen and U. K. Mishra. Patent pending (2005).
- P6. “*Method to Increase the Breakdown Voltage of a Field Effect Transistor*”. Inventors: T. Palacios, L. Shen and U. K. Mishra. Patent pending (2005).

PAPERS IN INTERNATIONAL JOURNALS

- J1. S. Rajan, U. K. Mishra, and T. Palacios, “*AlGaIn/GaN HEMTs: Recent Developments and Future Directions*”, accepted in International Journal of High Speed Electronics, 2008.
- J2. J. M. Tirado, F. Mievilte, J. W. Chung, J. L. Sanchez-Rojas, and T. Palacios, “*Origin of the Increasing Access Resistance in AlGaIn/GaN HEMTs*”, submitted to Electron Device Letters, April 2008.
- J3. T. Palacios, “*Beyond the AlGaIn/GaN HEMT: New Concepts for High-Speed Transistors*,” accepted in physica status solidi (a), Sept. 2008 (invited contribution).
- J4. T. Palacios, J. W. Chung, O. Saadat, and F. Mievilte: “*GaN and Digital Electronics: A Way out of Moore’s Law?*,” accepted in physica status solidi (a), Sept. 2008 (invited contribution).
- J5. H. Wang, D. Nezich, J. Kong, and T. Palacios: “*Graphene Frequency Multipliers*,” in press. Electron Device Letters, Sept. 2008.
- J6. H. Wang and T. Palacios, “*Efficiency of Graphene Nanoribbon RF Amplifiers: A Theoretical Analysis*”, submitted to Electron Device Letters, Sept. 2008.

- J7. J. W. Chung, Edwin L. Piner, and T. Palacios, “*N-face GaN/AlGaN HEMTs Fabricated through Layer Transfer Technology*”, *Electron Device Letters* 30, 113-116 (2009).
- J8. J. W. Chung, Edwin L. Piner, and T. Palacios, “*Effect of Gate Leakage on the Subthreshold Characteristics of AlGaN/GaN HEMTs*”, *Electron Device Letters* 29, 1196-1198 (2008).
- J9. J. W. Chung, X. Zhao, Y. Wu, J. Singh and T. Palacios, “*Effect of image charges in the drain delay of AlGaN/GaN high electron mobility transistors*”, *Appl. Phys. Letts*, 2008, vol. 92, 093502.
- J10. T. Palacios, L. Shen, L. Ardaravicius, S. Keller, A. Chakraborty, S. Heikman, A. Matulionis, and U. K. Mishra: “*Nitride-based High Electron Mobility Transistors with a GaN Spacer*”, *Appl. Phys. Lett.* 2006, 89, 073508.
- J11. T. Palacios, C. Suh, A. Chakraborty, S. Keller, S. P. DenBaars, and U. K. Mishra: “*AlGaN/GaN Enhancement-Mode HEMT for mm-wave Applications*”, *Elect. Dev. Lett.* 2006, vol. 27, pp. 428-430.
- J12. T. Palacios, Y. Dora, A. Chakraborty, C. Sanabria, S. Keller, S. P. DenBaars, and U. K. Mishra: “*Optimization of AlGaN/GaN HEMTs for High Frequency Operation*”, *phys. stat. sol. (a)* 2006, vol. 203, no. 7, 1845-1850 (*Editor’s choice*).
- J13. T. Palacios, A. Chakraborty, S. Heikman, S. Keller, S. P. DenBaars, and U. K. Mishra: “*AlGaN/GaN High Electron Mobility Transistors with InGaN Back-barrier*”, *Elect. Dev. Lett.*, 2006, vol. 27, pp. 13-15.
- J14. T. Palacios, A. Chakraborty, S. Rajan, C. Poblenz, S. Keller, S. P. DenBaars, J. S. Speck, and U. K. Mishra: “*High Power AlGaN/GaN HEMTs for Ka-band Applications*”, *Elect. Dev. Lett.*, 2005, vol. 26, pp. 781-783.
- J15. T. Palacios, A. Chini, D. Buttari, S. Heikman, A. Chakraborty, S. Keller, S. P. DenBaars, and U. K. Mishra: “*Use of Multichannel Heterostructures to Improve the Access Resistance and Linearity in GaN-Based HEMTs*”, *IEEE Trans. On Electron Devices*, 2006, vol. 53, 562-565.
- J16. T. Palacios, S. Rajan, A. Chakraborty, S. Heikman, S. Keller, S. P. DenBaars, and U. K. Mishra: “*Influence of the Dynamic Access Resistance in the g_m and f_T Linearity of AlGaN/GaN HEMTs*”, *IEEE Trans. On Electron Devices*, 2005, vol. 52, pp. 2117-2123.
- J17. T. Palacios, L. Shen, S. Keller, A. Chakraborty, S. Heikman, D. Buttari, S. P. DenBaars, and U. K. Mishra: “*Demonstration of a GaN-spacer High Electron Mobility Transistor with Low Alloy Scattering*”, *phys. stat. sol. (a)*, 2005, vol. 202, no. 5, pp. 837-840.
- J18. T. Palacios, F. Calle, and J. Grajal: “*Remote Collection and Measurement of Photogenerated Carriers Swept by Surface Acoustic Waves in GaN*”, *Appl. Phys. Lett.*, 2004, vol. 84, pp. 3166-3168.

- J19. T. Palacios, F. Calle, E. Monroy, and E. Muñoz: “*Submicron Technology for III-Nitride Semiconductors*”. J. Vac. Sci. & Tech. B, 2002, vol. 20, pp. 2071-2074.
- J20. T. Palacios, E. Monroy, F. Calle, and F. Omnès: “*High-responsivity submicron MSM UV detectors*”. Appl. Phys. Lett, 2002, vol. 81, pp. 1902-1904.
- J21. T. Palacios, F. Calle, E. Monroy, J. Grajal, M. Eickhoff, O. Ambacher and C. Prieto: “*Nanotechnology for SAW devices on AlN Epilayers*”. Mat. Sci. Eng. B., 2002, vol. 93, 1-3, pp. 154-158.
- J22. T. Palacios, F. Calle, E. Monroy, F. Naranjo, M. A. Sánchez-García, E. Calleja and E. Muñoz: “*Wet Etching of GaN grown by molecular beam epitaxy on Si(111)*”. Semic. Sci. and Tech., 2000, vol. 15, pp. 996-1000.
- J23. T. Palacios, F. Calle, E. Monroy, and F. Omnès: “*Novel approaches for metal-semiconductor-metal GaN UV photodetectors*”. phys. stat. sol. (a), 2002, no. 1, pp. 476-479.
- J24. Nidhi, T. Palacios, A. Chakraborty, S. Keller, and U. K. Mishra, “*Impact of Access resistance on High Frequency Performance AlGaIn/GaN HEMTs by Measurements at Low Temperatures*”, Electron Device Letters, 2006, vol. 27, no. 11, pp. 877-880.
- J25. L. Shen, T. Palacios, C. Poblenz, A. Corrión, A. Chakraborty, S. Keller, J. S. Speck, and U. K. Mishra, “*Unpassivated High Power Deeply-Recessed GaN HEMTs with Fluorine Plasma Surface Treatment*”, IEEE Electron Dev. Letts. 2006, vol. 27, 4, pp. 214-216.
- J26. F. Calle, T. Palacios, J. Pedros, and J. Grajal: “*Surface-acoustic-wave-controlled photodetectors*”, SPIE-Int. Soc. Opt. Eng. Proceedings of SPIE - the International Society for Optical Engineering, vol.5502, no.1, pp.439-42, 2004.
- J27. F. Calle, T. Palacios, E. Monroy, J. Grajal, M. Verdú, Z. Bougrioua and I. Moerman: “*AlGaIn/GaN HEMTs: Material, Processing and Characterization*”. Journal of Mat. Science: Material in Electronics, 2003, vol. 14, pp. 271-277.
- J28. W. Snoeys, T. Palacios and G. Anelli: “*New NMOS Layout Structure for Radiation Tolerance*”. IEEE Trans. Nuc. Sci., 2002, vol. 49, 4, pp. 1829-1833.
- J29. E. Monroy, T. Palacios, O. Hainaut, F. Omnès, F. Calle, and J.-F. Hochedez: “*Assessment of GaN metal-semiconductor-metal photodiodes for high-energy ultraviolet photodetection*”. Appl. Phys. Lett., 2002, vol. 80, 17, pp. 3198-3200.
- J30. Y. Pei, L. Shen, T. Palacios, N. A. Fichtenbaum, L. S. McCarthy, S. Keller, S. P. DenBaars. And U. K. Mishra, “*Study of the n^+ GaN cap in AlGaIn/GaN High Electron Mobility Transistors with Reduced Source-Drain Resistance*”, Jap. J. of Appl. Phys., 2007, vol. 46, L842.

- J31. M. H. Wong, Y. Pei, T. Palacios, L. Shen, A. Chakraborty, L. S. McCarthy, S. Keller, S. P. DenBaars, J. S. Speck, and U. K. Mishra, “*Low non-alloyed ohmic contact resistance to nitride HEMTs using N-face growth*”, Appl. Phys. Letts., 2007, 91, 232103.
- J32. A. Corrión, C. Poblenz, T. Palacios, S. Rajan, U. K. Mishra, and S. J. Speck, “*Review of recent developments in growth of AlGaIn/GaN high-electron mobility transistors on 4H-SiC by plasma-assisted molecular beam epitaxy*”. IEICE Trans.. on Electronics Special Section on Heterostructure Microelectronics, 2006, vol. E89-C, no. 7, pp. 906-912.
- J33. C. S. Suh, E. Snow, T. Palacios, L. Shen, Y. Dora, N. Fichtenbaum, A. Chakraborty, L. McCarthy, S. Keller, and U. K. Mishra, “*Systematic Characterization of Fluorine-Based Plasma Treatment on AlGaIn/GaN HEMTs*”, to be submitted to Elect. Dev. Letts. (Dec. 2005).
- J34. F. Calle, J. Pedrós, T. Palacios, and J. Grajal: “*Nitride-bases Surface Acoustic Wave Devices and Applications*”. Phys. Stat. Sol. c, 2005, vol. 2, 3, pp. 976-983.
- J35. C. Sanabria, H. Xu, T. Palacios, A. Chakraborty, S. Heikman, U. K. Mishra, and R. A. York: “*Influence of Epitaxial Structure in the Noise Figure of AlGaIn/GaN HEMTs*”. IEEE Trans. Microwave Theory Tech., 2004, vol 53, pp. 762-769.
- J36. D. Buttari, A. Chini, T. Palacios, R. Coffie, L. Shen, H. Xing, S. Heikman, L. McCarthy, A. Chakraborty, S. Keller, and U. K. Mishra: “*Origin of etch delay time in Cl₂ dry etching of AlGaIn/GaN structures*”. Appl. Phys. Lett., 2003, vol. 83, 23, pp. 4779-4781.
- J37. E. Monroy, F. Calle, T. Palacios, J. Sánchez-Osorio, M. Verdú, F. J. Sánchez, M. T. Montojo, F. Omnès, Z. Bougrioua, and I. Moerman: “*Reliability of Schottky contacts on AlGaIn*”, Phys. Stat. Sol. (a), 2001, 188, no. 1, pp. 367-370.
- J38. M. H. Wong, S. Rajan, R. M. Chu, T. Palacios, C. S. Suh, L.S. McCarthy, S. Keller, J. S. Speck, and U. K. Mishra, “*N-face high electron mobility transistors with a GaN-spacer*”, Phys. Stat. Sol. (a), 2007, 204, no. 6, pp. 2049-2053.
- J39. Y. Fu, L. Shen, Y. Pei, T. Palacios, Y. Dora, A. Chakraborty, and U. K. Mishra: “*AlGaIn Related Trap Level in MOCVD Ga-face GaN HEMTs*”, to be submitted to J. Appl. Phys. (2006).
- J40. E. Monroy, F. Calle, R. Ranchal, T. Palacios, M. Verdú, F. J. Sánchez, M. T. Montojo, M. Eickhoff, F. Omnès, Z. Bougrioua and I. Moerman: “*Reliability of Pt and Ni based Schottky contacts on AlGaIn*”, Semic. Sci. and Tech., 2002, vol 17 No 9 , L47-L54.
- J41. J. Rubio-Zuazo, R.J. Jiménez-Rioboó, E. Rodríguez-Cañas, C. Prieto, T. Palacios, F. Calle, E. Monroy and M. A. Sánchez-García: “*Brillouin Characterization of the Acousticwaves Phase-Velocity in Al_xGa_{1-x}N Epilayers*”. Mat. Sci. Eng. B., 2002, vol. 93, 1-3, pp. 168-171.

- J42. R. J. Jiménez Riboo, E. Rodríguez-Cañas, M. Vila, C. Prieto, F. Calle, T. Palacios, M. A. Sánchez, F. Omnès, O. Ambacher, B. Assouar and O. Elmazria: “*Hypersonic characterization of sound propagation velocity in AlGa_N thin films*”. J. Appl. Phys., 2002, vol. 92, pp. 6868-6874.
- J43. Z. Bougrioua, I. Moerman, L. Nistor, B. van Daele, E. Monroy, T. Palacios, F. Calle and M. Leroux: “*Engineering of an Insulating Buffer and Use of AlN Interlayers: Two Optimisations for AlGa_N/Ga_N HEMT-Like Structures*”, phys. stat. sol. (a), no. 3, 2003, pp. 93-100.
- J44. A. M. Sánchez, F. J. Pacheco, S. I. Molina, P. Ruterana, F. Calle, T. Palacios, M. A. Sánchez-García, E. Calleja and R. García: “*AlN Buffer Layer Thickness Influence on Inversion Domains in Ga_N/Al_N/Si (111)*”. Mat. Sci. Eng. B., 2002, vol. 93, 1-3, pp. 181-184.

INVITED TALKS

- I1. T. Palacios, “*On-Wafer Integration of Nitrides and Si Devices: Bringing the Power of Polarization to Si*,” IEEE International Microwave Symposium (IMS), Boston, MA (2009).
- I2. T. Palacios, “*The Challenges and Rewards of Industry/University Collaborative Research*,” IEEE International Microwave Symposium (IMS), Boston, MA (2009).
- I3. T. Palacios, “*GaN Transistors: Redefining the Limits of Electronics*,” 33rd Workshop on Compound Semiconductor Devices and Integrated Circuits (WOCSDICE), Malaga, Spain (2009).
- I4. T. Palacios, “*Heterogeneous Integration of Nitride and Si Electronics*,” Meeting of the American Physical Society, Pittsburg PA (2009).
- I5. J. W. Chung and T. Palacios, “*GaN and Si on-wafer Integration: The Future of High Frequency and High Power Electronics?*,” Connecticut Microelectronics and Optoelectronics Symposium Program, New Haven (CT), March 11, 2009.
- I6. T. Palacios, “*Beyond the AlGa_N/Ga_N HEMT: New Concepts for High-Speed Nitride Transistors*,” International Workshop on Nitride Semiconductors (IWN-2008), Montreaux, Switzerland, October 2008.
- I7. T. Palacios, “*GaN and Digital Electronics: A Way out of Moore’s Law?*,” International Symposium on Compound Semiconductors (ISCS-2008), Freiburg, Germany, September 21-24, 2008.
- I8. T. Palacios, “*GaN Electronics*,” OptoSchool Summer School 2008, Mumbai, India, July 2008.

- I9. T. Palacios, “*Nitride Transistors for Beyond-Si Digital Electronics*”, 213th Electrochemical Society Meeting, Phoenix, AZ, May 18-23, 2008.
- I10. T. Palacios, “*GaN-based Amplifiers: Redefining Wireless Communications*”, 2007 MIT Research and Development Conference (Cambridge, MA), November 15th, 2007.
- I11. T. Palacios, “*Introducing Course 6 to Freshmen MIT students*”, MacGregor House, MIT (Cambridge, MA), November 15th, 2007.
- I12. T. Palacios, “*Nitride Electronics: New Ideas at the mm-wave Frontier*”, Nothrop Grummand Corporation, September 10th, 2007.
- I13. T. Palacios, “*New Device Ideas for Nitride-based mm-wave Electronics*”, European Heterostructure Technology Workshop (HETECH), September 3rd, 2007.
- I14. T. Palacios, “*Nitride Electronics: The Power of Polarization*”, Hitachi Electric (Tokio, Japan), August 29th, 2007.
- I15. T. Palacios, “*Nitride Electronics: The Power of Polarization*”, Toyota Central Research Laboratories (Nagoya, Japan), August 28th, 2007.
- I16. T. Palacios, “*Nitride Electronics: The Power of Polarization*”, NEC (Kyoto, Japan), August 27th, 2007.
- I17. T. Palacios, “*Recent Progress in GaN HEMTs for mm-waves frequencies and beyond*”, 7th Topical Workshop on Heterostructure Microelectronics (TWHM 2007), August 2007.
- I18. T. Palacios, “*Nitride Electronics: The Power of Polarization*”, TriQuint Electronics (Dallas, TX), August 9th, 2007.
- I19. T. Palacios, “*Nitride Electronics: The Power of Polarization*”, M/A-COM Electronics, July 30th, 2007.
- I20. T. Palacios, “*Surviving your First Year as an Assistant Professor*”, Massachusetts Institute of Technology, July 18th, 2007.
- I21. T. Palacios, “*Nitride Electronics: New Ideas at the mm-wave Frontier*”, IEEE Massachusetts Seminar Series, Lincoln Laboratory, April 23rd, 2007.
- I22. T. Palacios, “*Nitride Electronics: New Ideas at the mm-wave Frontier*”, CEA-Grenoble, March 28th, 2007.
- I23. T. Palacios, “*Nitride Electronics: New Ideas at the mm-wave Frontier*”, University of Notre Dame, South Bend, IN, March 20th, 2007.

- I24. T. Palacios, “*Nitride Electronics: New Ideas at the mm-wave Frontier*”, Tufts University, Cambridge, MA, March 6th, 2007.
- I25. T. Palacios et al., “mm-wave Initiative for Carbon Electronics”, DARPA Workshop on Carbon-Based Ultra-High Speed Electronics for Wafer-Scale Integration, April 19th, 2007.
- I26. T. Palacios, S. Rajan, A. Chakraborty, S. Keller, S. P. DenBaars, and U. K. Mishra: “*Dipole Engineering in Nitride-based HEMTs*”. 208th Meeting of the Electrochemical Society, Los Angeles, October 16-21 2005.
- I27. T. Palacios, Walter Schottky Institute, Technical University of Munich, Munich, Germany, Sept. 2005.
- I28. T. Palacios, ISOM, Universidad Politecnica de Madrid, Spain, Sept. 2005.
- I29. U. K. Mishra, T. Palacios, S. Keller, N. Fichtenbaum, J. Speck, and S. P. DenBaars: “*GaN HEMTs: The Ideal Device for mm-Wave Applications?*”, International Workshop on Nitride Semiconductors, IWN 2006, Kyoto, Japan. October 22-27, 2006.
- I30. F. Calle, J. Pedrós, T. Palacios, and J. Grajal: “*Nitride-bases Surface Acoustic Wave Devices and Applications*”. European Meeting of the Material Research Society, E-MRS, Varsovia, Fall 2004.
- I31. M. Eickhoff, O. Ambacher, G. Steinhoff, J. Schalwig, R. Neuberger, T. Palacios, E. Monroy, F. Calle, G. Müller and M. Stutzmann: “*Novel Sensor Applications of group-III nitrides*”. MRS Fall Meeting, Boston 2001.

CONFERENCE CONTRIBUTIONS

- C1. H. Wang, D. Nezich, J. Kong, and T. Palacios, “*Graphene Frequency Multipliers*,” 2009 Meeting of the American Physics Society, Pittsburgh, March 2009.
- C2. B. Lu and T. Palacios, “*New-Enhancement Mode GaN HEMT based on Dipole-Engineering*,” International Workshop on Nitride Semiconductors, Montreux, Switzerland, Oct. 2008.
- C3. O. I. Saadat, J. Chung, E. L. Piner, and T. Palacios, “*Gate-first GaN HEMT Technology for High Frequency Applications*,” International Workshop on Nitride Semiconductors, Montreux, Switzerland, Oct. 2008.
- C4. J. W. Chung, B. Lu, E. Piner, and T. Palacios, “*On-wafer integration of GaN and Si (100) Electronics through substrate removal technology*,” International Workshop on Nitride Semiconductors, Montreux, Switzerland, Oct. 2008.

- C5. J. M. Tirado, F. Mievilte, X. Zhao, J. Chung, J. L. Sanchez-Rojas, and T. Palacios, “*Origin of the Increasing Access Resistance in AlGaIn/GaN HEMTs*”, 66th Device Research Conference, University of California Santa Barbara, June 2008.
- C6. J. W. Chung, E. Piner, and T. Palacios, “*N-face GaN/AlGaIn Transistors Through Substrate Removal*”, 66th Device Research Conference, University of California Santa Barbara, June 2008.
- C7. T. Palacios, “*Steps towards 300 GHz GaN amplifiers*”, WOCSEMMAD 2008, Palm Springs, CA, Feb. 17-20, 2008.
- C8. X. Zhao, J. W. Chung, and T. Palacios, “*Atomic Layer Etching of AlGaIn/GaN Structures*”, International Conference on Nitride Semiconductors, Las Vegas, NV, Sept. 17-21, 2007.
- C9. X. Zhao, J. W. Chung, and T. Palacios, “*Increase of Electron Velocity in GaN HEMTs by Electric Field Engineering*”, International Conference on Nitride Semiconductors, Las Vegas, NV, Sept. 17-21, 2007.
- C10. J. W. Chung, X. Zhao, and T. Palacios, “*Effect of Image Charges in the Drain Delay of AlGaIn/GaN HEMTs*”, International Conference on Nitride Semiconductors, Las Vegas, NV, Sept. 17-21, 2007.
- C11. J. W. Chung, X. Zhao, and T. Palacios, “*Estimation of Trap Density in AlGaIn/GaN HEMTs from Subthreshold Slope Study*”, 65th Device Research Conference, University of Notre Dame, June 18-20, 2007.
- C12. X. Zhao, J. W. Chung, H. Tang, and T. Palacios, “*Schottky Drain AlGaIn/GaN HEMTs for mm-wave Applications*”, 65th Device Research Conference, University of Notre Dame, June 18-20, 2007.
- C13. T. Palacios, Z. Xu, J. W. Chung: “*Drain Delay: The Ultimate Limit for the Frequency Performance of AlGaIn/GaN HEMTs*”, 12th Advanced Heterostructure Workshop, Kohala Coast, Big Island of Hawai’I, December 3-8, 2006.
- C14. T. Palacios, N. Fichtenbaum, S. Keller, S. P. DenBaars, and U. K. Mishra: “*50 nm AlGaIn/GaN Technology for mm-wave Applications*”, 64th Device Research Conference, Penn State University, June 26-28, 2006.
- C15. T. Palacios, C.-S. Suh, E. Snow, Y. Dora, and U. K. Mishra: “*GaN HEMT’s enhanced by Fluorine Treatment*”, WOCSEMMAD 2006, Phoenix, AZ, Feb. 20-22, 2006.
- C16. T. Palacios, A. Chakraborty, S. Keller, S. P. DenBaars, and U. K. Mishra: “*High Power AlGaIn/GaN HEMTs for mm-Wave Operation*”. Government Microcircuit Applications and Critical Technology Conference, GomaticTech 2006, San Diego, March 20-23, 2006.

- C17. T. Palacios, E. Snow, Y. Pei, A. Chakraborty, S. Keller, S. P. DenBaars, and U. K. Mishra: “*Ge-spacer Technology in AlGa_N/Ga_N HEMTs for mm-Wave Applications*”. International Electron Device Meeting, IEDM-2005, Washington, December 5-7, 2005. Late news paper.
- C18. T. Palacios, A. Chakraborty, S. Keller, S. P. DenBaars and U. K. Mishra: “*Optimization of Device Structure and Harmonic Tuning in AlGa_N/Ga_N HEMTs for High Power Added Efficiency*”. International Symposium on Compound Semiconductors, Freiburg, Germany, September 2005.
- C19. T. Palacios and U. K. Mishra: “*Determining electron velocity in Ga_N-based HEMTs*”. 14th International Conference on Nonequilibrium Carrier Dynamics in Semiconductors, HCIS-14, Chicago, July 24-29 2005.
- C20. T. Palacios, Y. Dora, A. Chakraborty, C. Sanabria, S. Keller, S. P. DenBaars, and U. K. Mishra: “*Optimization of AlGa_N/Ga_N HEMTs for High Frequency Operation*”. International Conference on Nitride Semiconductors, ICNS-2005, Bremen, Germany, September 2005.
- C21. T. Palacios, A. Chakraborty, S. Keller, S. P. DenBaars, and U. K. Mishra: “*AlGa_N/Ga_N HEMTs with an InGa_N-based back-barrier*”. Device Research Conference, Santa Barbara, June 2005.
- C22. T. Palacios, L. Shen, S. Keller, A. Chakraborty, S. Heikman, D. Buttari, S. P. DenBaars, and U. K. Mishra: “*GaN-spacer HEMTs: the impact of AlGa_N in the v_e of AlGa_N/Ga_N HEMTs*”. 11th Advanced Heterstructure Workshop, Hawai’i, December 2004.
- C23. T. Palacios, L. Shen, S. Keller, A. Chakraborty, S. Heikman, D. Buttari, S.P. DenBaars, and U.K. Mishra: “*Demonstration of a Ga_N-spacer High Electron Mobility Transistor with Low Alloy Scattering*”. International Workshop on Nitride Semiconductors, IWN-2004, Pittsburgh, July 2004.
- C24. T. Palacios, A. Chini, D. Buttari, S. Heikman, S. Keller, S.P. DenBaars, and U.K. Mishra: “*Use of Multichannel Heterostructures to Improve the Access Resistance and f_T Linearity in Ga_N-based HEMTs*”. Device Research Conference, Notre Dame, June 2004.
- C25. T. Palacios, S. Rajan, L. Shen, A. Chakraborty, S. Heikman, S. Keller, S.P. DenBaars, and U.K. Mishra: “*Influence of the Access Resistance in the rf Performance of mm-wave AlGa_N/Ga_N HEMTs*”. Device Research Conference, Notre Dame, June 2004.
- C26. T. Palacios, F. Calle, J. Grajal, E. Monroy, M. Eickhoff, O. Ambacher, and F. Omnès: “*High Frequency SAW Devices on AlGa_N: Fabrication, Characterization and Integration with Optoelectronics*”. 2002 IEEE International Ultrasonic Symposium. Munich, 8-11 October 2002.

- C27. T. Palacios, F. Calle, E. Monroy, F. Omnès: “*Novel Approaches for Submicron Metal-Semiconductor-Metal GaN UV Photodetectors*”. International Workshop on Nitride Semiconductors. Aachen, 22-25 July 2002.
- C28. T. Palacios, E. Monroy, F. Calle, and F. Omnès: “*Technology and Performance of Submicron Metal-Semiconductor-Metal GaN Ultraviolet Detectors*”. 60th Annual Device Research Conference. Santa Barbara, 24-28 June 2002.
- C29. T. Palacios, F. Calle, E. Monroy, J. Grajal, M. Eickhoff, O. Ambacher, R. Jiménez, and C. Prieto: “*AlGaIn/Sapphire Epilayers for Acoustic Wave Devices*”. 2002 Electronic Materials Conference. Santa Barbara, 28-30 June 2002.
- C30. T. Palacios, F. Calle, E. Monroy, J. Grajal, M. Eickhoff, O. Ambacher, F. Omnès, Z. Bougrioua, I. Moerman and E. Muñoz: “*Sub-micron technology in group-III nitrides. Application to electronic devices*”. 11th European Heterostructure Technology Workshop. Padova, 28-30 October 2001.
- C31. T. Palacios, F. Calle, E. Monroy, J. Grajal, M. Eickhoff, O. Ambacher and C. Prieto: “*Nanotechnology for SAW devices on AlN Epilayers*”. 11th International Travelling Summer School in Microwaves and Lightwaves. Madrid, 7-12 July 2001.
- C32. T. Palacios, F. Calle, E. Monroy, J. Grajal, M. Eickhoff, O. Ambacher and C. Prieto: “*Nanotechnology for SAW devices on AlN Epilayers*”. E-MRS Spring Meeting. Strasbourg, 5-8 June 2001.
- C33. T. Palacios, F. Calle, E. Monroy, O. Abril, C. Prieto and C. Zaldo: “*Design and Processing of SAW Devices on AlN Epilayers*”. 3^a Conferencia de Dispositivos Electrónicos. Granada, 15-16 February 2001.
- C34. C.-S. Suh, T. Palacios, S. Rajan, A. Chini, E. Snow, Y. Dora, L. Shen, C. Poblentz, N. Fichtenbaum, A. Chakraborty, S. Keller, S. DenBaars, J. Speck, and U. K. Mishra: “*E-mode GaN HEMTs*”. WOCSEMMAD 2006, Phoenix AZ, February 2006.
- C35. S. Rajan, T. Palacios, S. P. DenBaars, and U. K. Mishra: “*Electron Mobility in Graded AlGaIn Layers*”. WOCSEMMAD 2005, Miami. February 2005.
- C36. F. Calle, T. Palacios, J. Pedrós and J. Grajal: “*Surface-acoustic-waves controlled photodetectors*”. 2nd European Workshop on Fibre Optical Sensors. Santander, 9-11 June 2004.
- C37. F. Calle, T. Palacios, E. Monroy, J. Grajal, J.M. Tirado, A. Jiménez, E. Muñoz, M. Verdú, F. J. Sánchez, M. T. Montojo, Z. Bougrioua and I. Moerman: “*Fabrication and characterization of AlGaIn/GaN HEMTs*”. 4th International Conference on Materials for Microelectronics and Nanoengineering. Espoo, Finland, 10-12 June 2002.

- C38. Y. Pei, D. Buttari, T. Palacios, L. Shen, R. Chu, N. Fichtenbaum, L. McCarthy, S. Heikman, A. Chakraborty, S. Keller, S. P. DenBaars, and U. K. Mishra, "Application of n+ GaN Cap in AlGaIn/GaN HEMT". Fall Meeting of the Material Research Society, Boston, November 2006.
- C39. M. H. Wong, R. Chu, T. Palacios, S. Rajan, J. S. Speck, and U. K. Mishra: "*N-face High Electron Mobility Transistors with a GaN spacer*", International Workshop on Nitride Semiconductors, IWN-2005, Kyoto, Japan, October 2006.
- C40. C. Sanabria, H. Xu, T. Palacios, A. Chakraborty, S. Heikman, U. K. Mishra, and R. A. York: "*Noise Figure Measurement and Modeling of Field-Plated AlGaIn/GaN HEMTs*". International Conference on Nitride Semiconductors, ICNS-2005, Bremen, Germany, August 2005.
- C41. C. Sanabria, H. Xu, T. Palacios, A. Chakraborty, S. Heikman, U.K. Mishra, R.A. York: "*Influence of the Heterostructure Design in Noise Figure of AlGaIn/GaN HEMTs*". Device Research Conference, Notre Dame, June 2004.
- C42. W. Snoeys, G. Anelli and T. Palacios: "*New NMOS Layout Structure for Radiation Tolerance*". IEEE Nuclear Science Symposium. San Diego (USA), 4-10 November 2001.
- C43. E. Monroy, F. Calle, T. Palacios, J. Sánchez-Osorio, M. Verdú, F. J. Sánchez, M. T. Montojo, F. Omnès, Z. Bougrioua and I. Moerman: "*Reliability of Schottky contacts on AlGaIn*". 4th International Conference on Nitride Semiconductors. Denver, 16-20 July 2001.
- C44. J. M. Montero, J. Colás, T. Palacios, R. de Córdoba, J. Macías and A. de Santos: "*El Laboratorio en casa: un Sistema de Desarrollo basado en el Microcontrolador 68331, de bajo coste*". Congreso de Tecnologías Aplicadas a la Enseñanza de la Electrónica TAAE'2000 vol. II pp. 381-384, September 2000, Barcelona. ISBN: 84-600-9596-7 edited by Gabriel Abadal and Nuria Varonil (ETS Ingeniería- UAB).
- C45. A. Matulionis, J. Liberis, O. Kiprijanovic, T. Palacios, A. Chakraborty, S. Keller, and U. K. Mishra: "Effect of alloy scattering on electron drift velocity in GaN HEMTs", 30th Workshop on Compound Semiconductors Devices and Integrated Circuits (WOCSDICE), Fiskebackskil, Sweden, May 13-17, 2006.
- C46. M. Singh, Y.-R. Wu, J. Singh, T. Palacios and U. Mishra: "*Monte Carlo study of noise scaling in AlGaIn/GaN HFETs*". 27th International Conference on the Physics of Semiconductors. Flagstaff, Florida, 26-30 July 2004.
- C47. J. Grajal, F. Calle, J. Pedrós and T. Palacios: "*Voltage controlled SAW filters on 2DEG AlGaIn/GaN heterostructures*". 2004 International Microwave Symposium. Fort Worth, Texas, 6-11 June 2004.

- C48. J. Pedrós, F. Calle, J. Grajal, T. Palacios, A. Jiménez, F. Omnès and Z. Bougrioua: “SAW devices on 2DEG AlGaN/GaN heterostructures”, 12th European Workshop on Heterostructure Technology (heTech 2003). Segovia (Spain), 12-15 October 2003.
- C49. F. Recht, L. McCarthy, S. Rajan, A. Chakraborty, T. Palacios, C. Poblentz, J. S. Speck, and U. K. Mishra: “Origin of the Resistance in Unalloyed Ion Implanted Ohmics in AlGaN/GaN HEMTs”, International Symposium on Compound Semiconductors, Vancouver (Canada), 13-17 August 2006.
- C50. A. Chini, D. Buttari, R. Coffie, L. Shen, T. Palacios, S. Heikman, A. Chakraborty, S. Keller, and U. K. Mishra: “*Effect of Gate Recessing on the Linearity Characteristics of AlGaN/GaN HEMTs*”. Device Research Conference, Notre Dame, June 2004.
- C51. J. Rubio-Zuazo, R.J. Jiménez-Rioboó, E. Rodríguez-Cañas, C. Prieto, T. Palacios, F. Calle, E. Monroy and M. A. Sánchez-García: “*Brillouin Characterization of the Acoustic waves Phase-Velocity in $Al_xGa_{1-x}N$ Epilayers*”. E-MRS Spring Meeting. Strasbourg, 5-8 June 2001.
- C52. D. Buttari, A. Chini, A. Chakraborty, L. McCarthy, H. Xing, T. Palacios, L. Shen, S. Keller, and U. K. Mishra: “*Selective dry etching of GaN over AlGaN in BCl_3/SF_6 mixtures*”. Lester Eastman Conference on High Performance Devices. Troy, NY, 4-6 August 2004.
- C53. S. Rajan, H. Xing, A. Chakraborty, A. Chini, M. J. Grundmann, T. Palacios, S. P. DenBaars, D. Jena, and U. K. Mishra: “*Tailoring the Transconductance Profile for Improved Linearity in AlGaN/GaN Polarization-Doped Field Effect Transistors*”. International Workshop on Nitride Semiconductors, IWN-2004, Pittsburgh, July 2004.
- C54. Z. Bougrioua, I. Moerman, L. Nistor, B. van Daele, E. Monroy, T. Palacios, F. Calle and M. Leroux: “*Engineering of an Insulating Buffer and Use of AlN Interlayers: Two Optimisations for AlGaN/GaN HEMT-Like Structures*”. Expert Evaluation and Control of Compound Semiconductor Materials and Technologies, EXMATEC, Budapest, May 2002.
- C55. F. Calle, E. Monroy, J. M. Tirado, R. Ranchal, A. Jiménez, T. Palacios, E. Muñoz, J. Grajal, M. Verdú, F. J. Sánchez, M. T. Montojo, Z. Bougrioua and I. Moerman: “*Fabrication and characterization of AlGaN/GaN HEMTs*”. 11th European Heterostructure Technology Workshop. Padova, 28-30 October 2001.
- C56. A. M. Sánchez, F. J. Pacheco, S. I. Molina, P. Ruterana, F. Calle, T. Palacios, M. A. Sánchez-García, E. Calleja and R. García: “*AlN Buffer Layer Thickness Influence on Inversion Domains in GaN/AlN/Si (111)*”. E-MRS Spring Meeting. Strasbourg, 5-8 June 2001.
- C57. A. M. Sánchez, P. Ruterana, S. I. Molina, F. J. Pacheco, R. García, F. Calle, T. Palacios, M. A. Sánchez-García, E. Calleja: “*Correlation between the AlN buffer layer thickness and the*

GaN polarity in GaN/AlN/Si (111) grown by MBE". MRS Fall Meeting. Boston, 2-6 November 2002.