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PERSONAL

Born in Tandil, Argentina, in 1957. US Citizen.

EMPLOYMENT

Professor of Physics — **1998-Present**
ARIZONA STATE UNIVERSITY — TEMPE, AZ

Associate Professor of Physics — **1992-1998**
ARIZONA STATE UNIVERSITY — TEMPE, AZ

Contractor — **1997**
MOTOROLA, INC — MESA, AZ

Assistant Professor of Physics — **1987-1992**
ARIZONA STATE UNIVERSITY — TEMPE, AZ

Consultant — **1988-1989**
AT&T BELL LABORATORIES — TEMPE, AZ

Postdoctoral Member of Technical Staff — **1985-1987**
AT&T BELL LABORATORIES — MURRAY HILL, NJ

Research Associate — **1981-1985**
MAX-PLANCK-INSTITUT FÜR FESTKÖRPERFORSCHUNG — STUTTGART, GERMANY

EDUCATION

Dr. rer. nat. — **1985**
UNIVERSITÄT STUTTGART — STUTTGART, GERMANY

Major: Physics
Thesis: Ramanspektroscopische Untersuchungen der Phonon-Phonon und Elektron-Phonon Wechselwirkungen in tetraedisch koordinierten Halbleitern (Raman Investigations of the phonon-phonon and electron-phonon interactions in tetrahedral semiconductors).
Advisor: Prof. Dr. Dr. h.c. Manuel Cardona i Castro.

Licenciado — **1980**
INSTITUTO BALSEIRO — BARILOCHE, ARGENTINA

Major: Physics

Thesis: Espectroscopía de electrones en cerio metálico (Electron Spectroscopy in metallic Cerium)
Advisor: Prof. Dr. Raúl Baragiola

MEMBERSHIPS

American Physical Society. Materials Research Society.
Elected Member-at-Large for the Forum on International Physics (APS) for 1999-2001.

HONORS

1990 Presidential Young Investigator Award
1998 Iberdrola Fellow (Universidad Autónoma de Madrid, Madrid, Spain)
2002 Dean's Quality of Teaching Award, College of Liberal Arts and Sciences, ASU.
2003 Focus Center Fellow, University of Michigan, Ann Arbor.
2008 American Physical Society Outstanding Referee.
2009 Outstanding Teaching Award, Department of Physics, ASU.

REFEREED JOURNAL PUBLICATIONS

1. V. R. D'Costa, Y. Fang, J. Mathews, R. Roucka, J. Tolle, J. Menendez, and J. Kouvetakis, "Sn-alloying as a means of increasing the optical absorption of Ge at the *C*- and *L*-telecommunication bands," Semicond. Sci. Technol. **24**, 115006 (2009).
2. J. Mathews, R. Roucka, J. Q. Xie, S. Q. Yu, J. Menéndez, and J. Kouvetakis, "Extended performance GeSn/Si(100) p-i-n photodetectors for full spectral range telecommunication applications," Appl. Phys. Lett. **95** 133506 (2009).
3. V. R. D'Costa, J. Tolle, J. Q. Xie, J. Kouvetakis, and J. Menéndez, "Infrared dielectric function of p-type $Ge_{0.98}Sn_{0.02}$ alloys," Phys. Rev. B **80** 125209 (2009).
4. J. Q. Xie, J. Tolle, V. R. D'Costa, C. Weng, A. V. G. Chizmeshya, J. Menéndez, and J. Kouvetakis, "Molecular approaches to *p*- and *n*-nanoscale doping of $Ge_{1-y}Sn_y$ semiconductors: Structural, electrical and transport properties," Solid-State Electronics **53**, 816 (2009).
5. J. Tolle, R. Roucka, B. Forrest, A. V. G. Chizmeshya, J. Kouvetakis, V. R. D'Costa, C. D. Poweleit, M. Groenert, T. Sato, and J. Menéndez, "Integration of Zn-Cd-Te-Se Semiconductors on Si Platforms via Structurally Designed Cubic Templates Based on Group IV Elements," Chemistry Of Materials **21**, 3143 (2009).
6. J. B. Tice, C. G. Weng, J. Tolle, V. R. D'Costa, R. Singh, J. Menéndez, J. Kouvetakis, and A. V. G. Chizmeshya, "Ether-like Si-Ge hydrides for applications in synthesis of nanostructured semiconductors and dielectrics," Dalton Transactions **34** 6773 (2009).
7. Y. Y. Fang, J. Tolle, A. V. G. Chizmeshya, J. Kouvetakis, V. R. D'Costa, and J. Menéndez, "Practical B and P doping via $Si_xSn_yGe_{1-x-y-z}M_z$ quaternaries lattice matched to Ge: Structural, electrical, and strain behavior," Appl. Phys. Lett. **95** 081113 (2009).
8. José Menéndez, "Analytical strain relaxation Model for $Si_{1-x}Ge_x$ epitaxial layers," J. Appl. Phys. **105**, 063519 (2009).
9. V. R. D'Costa, Y. Y. Fang, J. Kouvetakis, and J. Menéndez, "Tunable Optical Gap at a Fixed Lattice Constant in Group-IV Semiconductor Alloys," Phys. Rev. Lett. **102**, 107403 (2009).
10. Y. Y. Fang, V. R. D'Costa, J. Tolle, J. B. Tice, C. D. Poweleit, J. Menéndez, and J. Kouvetakis,

"Highly strained metastable structures and selective area epitaxy of Ge-rich $Ge_{1-x}Si_x$ /Si(100) materials using nanoscale building blocks," Solid State Commun. **149**, 78 (2009).

11. R. Roucka, Y. J. An, A. V. G. Chizmeshya, V. R. D'Costa, J. Tolle, J. Menéndez, and J. Kouvetakis, "Structural and optical properties of ZrB_2 and Hf_x $Zr_{1-x}B_2$ films grown by vicinal surface epitaxy on Si(111) substrates," Solid State Electr. **52**, 1687 (2008).
12. Y. Y. Fang, J. Xie, J. Tolle, R. Roucka, V. R. D'Costa, A.V.G. Chizmeshya, J. Menéndez, and J. Kouvetakis, "A molecular-based synthetic approach to new group-IV materials for high efficiency, low cost solar cells and Si-based optoelectronics, " J. Am. Chem. Soc. **130**, 16095 (2008).
13. R. Roucka, J. Xie, J. Kouvetakis, J. Mathews, V. D. Costa, J. Menéndez, J. Tolle, and S. Q. Yu, "$Ge_{1-y}Sn_y$ photoconductor structures at 1.55 microns: From advanced materials to prototype devices," J. Vac. Sci. Technol. B **26,** 1952 (2008).
14. Y. Y. Fang, V. R. D'Costa, J. Tolle, C. D. Poweleit, J. Kouvetakis, and J. Menéndez, Strained Si films grown by chemical vapor deposition of trisilane on Ge buffered Si(100)," Thin Solid Films **516,** 8327 (2008).
15. N. Bonini, R. Rao, A. M. Rao, N. Marzari, and J. Menéndez, "Lattice anharmonicity in low-dimensional carbon systems" Phys. Stat. Sol. (b) **245,** 2149 (2008).
16. J. Kouvetakis, Y. J. An, V. R. D'Costa, J. Tolle, A. V. G. Chizmeshya, and J. Menéndez, "Synthesis of (Hf, Zr)B_2-based heterostructures: hybrid substrate systems for low temperature Al-Ga-N integration with Si," J. Mater. Chem. **18,** 4775 (2008).
17. R. Roucka, V. R. D'Costa, Y. J. An, M. Canonico, J. Kouvetakis, J. Menéndez, and A. V. G. Chizmeshya, "Thermoelastic and optical properties of thick boride templates on silicon for nitride integration applications," Chem. Mater. **20,** 1431 (2008).
18. Yan-Yan Fang, J. Tolle, J. Tice, A.V.G. Chizmeshya, J. Kouvetakis, V.R. D'Costa, and J. Menéndez, "Epitaxy driven synthesis of elemental Ge/Si materials and devices with strained engineered structures via designer molecular chemistry," Chemistry of Materials **19** (24), 5910-5925 (2007).
19. R. Rao, J. Menendez, C. D. Poweleit, and A. M. Rao, "Anharmonic Phonon Lifetimes in Carbon Nanotubes: Evidence for a One-Dimensional Phonon Decay Bottleneck," Phys. Rev. Lett. **99**, 047403 (2007).
20. G. Sun, H.H. Cheng, J. Menéndez, J.B Khurgin, R.A. Soref, "Strain-free Ge/GeSiSn quantum cascade lasers based on L-valley intersubband transitions," Appl. Phys. Lett. **90**, 251105 (2007).
21. V. R. D'Costa, J. Tolle, R. Roucka, C. D. Poweleit, J. Kouvetakis, and J. Menéndez, "Raman Scattering in Ge_{1-y} Sn_y alloys," Solid State Commun. **144** (5-6), 240 (2007).
22. V. R. D'Costa, J. Tolle, C. D. Poweleit, J. Kouvetakis, and J. Menendez, "Compositional dependence of Raman frequencies in ternary $Ge_{1-x-y}Si_xSn_y$ alloys," Phys. Rev. B **76**, 035211 (2007).
23. Y. Y. Fang, J. Tolle, R. Roucka, A. V. G. Chizmeshya, J. Kouvetakis, V. R. D'Costa, and J. Menendez, "Perfectly tetragonal, tensile-strained Ge on $Ge_{1-x-y}Sn_y$ buffered Si(100)," Appl. Phys. Lett. **90**, 061915 (2007).
24. R. Roucka, J. Tolle, B. Forrest, J. Kouvetakis, V. R. D'Costa, and J. Menéndez, "$Ge_{1-y}Sn_y$ /Si(100) composite substrates for growth of In_x $Ga_{1-x}As$ and $GaAs_{1-x}Sb_x$ alloys," J. Appl. Phys. **101**, 013518 (2007).

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27. J. Tolle, A. V. G. Chizmeshya, Y. Y. Fang, J. Kouvetakis, V.R. D'Costa, C.W. Hu, J. Menéndez, I.S.T. Tsong, "Low temperature chemical vapor deposition of Si-based compounds via $SiH_3SiH_2SiH_3$: Metastable SiSn/GeSn/Si(100) heteroepitaxial structures," Appl. Phys. Lett. **89**, 231924 (2006).

28. V. G. Chizmeshya, C. Ritter, J. Tolle, C. Cook, J. Menendez, and J. Kouvetakis, "Fundamental Studies of $P(GeH_3)_3$, $As(GeH_3)_3$, and $Sb(GeH_3)_3$: Practical n-Dopants for New Group IV Semiconductors," Chem. Mater. **18**, 6266 (2006).

29. V.R. D'Costa, C.S. Cook, A.G. Birdwell C.L. Litter, M. Canonico, S. Zollner, J. Kouvetakis, and J. Menéndez, "Optical critical points of thin-film $Ge_{1-y}Sn_y$ alloys: a comparative $Ge_{1-y}Sn_y/Ge_{1-x}Si_x$ study,"Phys. Rev. B **73** 125207 (2006).

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