

# Curriculum Resumido

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## Resumen

Artículos de investigación en revistas especializadas 83  
Artículos en revistas o libros de congresos 11  
Reportes internos UAMI-CBI 5  
Artículos de divulgación 7  
Citas (excluyendo autocitas) 153  
Patentes 1  
Trabajos presentados en congresos 75  
Cursos impartidos 119  
Dirección de tesis de posgrado 12  
Revisor de tesis de posgrado 9  
Conferencias dictadas 75  
Exposiciones científicas 5

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## 2. artículos científicos

- [1] M. Fernández-Guasti and R. Cudney Bueno. Mesa holográfica estable a un costo mínimo. *Rev. Mex. Fís.*, 33(4):631–639, 1988.
- [2] M. Fernández-Guasti and A. Gil-Villegas. Propagation of rays in a duct with a radially variable refractive index: first integral solutions for Gaussian profiles. *Opt. Comm.*, 69(2):105–107, 1988.
- [3] E. Haro-Poniatowski, M. Fernández-Guasti, E.R. Méndez, and M. Balkanski. Optical Bistability in bulk GeSe<sub>2</sub>. *Opt. Comm.*, 70(1):70–72, 1989.
- [4] M. Fernández-Guasti, D. Iturbe Castillo, A. Silva-Pérez, A. Gil-Villegas, H. González Torres, and R. López Guerrero. Fabricación de hologramas con un láser sintonizable pulsado. *Rev. Mex. Fís.*, 35(3):410–417, 1989.
- [5] E. Haro-Poniatowski, M. Fernández-Guasti, H. Márquez, E.R. Méndez, and M. Eddrief. Preparation and characterization of amorphous GeSe<sub>2</sub> films. *Mat. Sci. Eng.*, 5:423–426, 1990.
- [6] M. Fernández-Guasti and R. Rangel Rojo. Diseño y construcción de láseres de pigmento. *Rev. Mex. Fís.*, 36(1):118–130, 1990.
- [7] M. Fernández-Guasti, E. Haro-Poniatowski, and S. Camacho López. Phase conjugation in amorphous germanium diselenide thin films. *Appl. Phys. Lett.*, 58(11):1137–1139, 1991.
- [8] M. Fernández-Guasti, R. Rangel Rojo, and M. Yamada. Generación de segundo armónico en ADP con un láser de pigmento sintonizable en el rango de 285nm a 300nm. *Rev. Mex. Fís.*, 37(2):309–320, 1991.
- [9] L. Escobar-Alarcón and M. Fernández-Guasti. Técnicas de blanqueado de emulsiones holográficas. *Rev. Mex. Fís.*, 38(3):464–477, 1992.
- [10] E. Haro-Poniatowski, M. Fernández-Guasti, and S. Camacho López. Phase conjugation in amorphous selenium thin films. *Optics Lett.*, 17(4):p.252–254, 1992.
- [11] M. Fernández-Guasti, A. Silva-Pérez, D. Iturbe Castillo, E. Haro-Poniatowski, L. Escobar-Alarcón, P. Habichayn Polloni, A. García García, R. Cudney Bueno, C. García Guerrero, and E. González Avalos. Diseño y construcción de láseres de nitrógeno molecular. *Rev. Mex. Fís.*, 38(4):588–610, 1992.

- [12] M. Fernández-Guasti. Analytic geometry of some rectilinear figures. *Int. Jour. of Math. Ed. in Sci. & Tech.*, 23(6):895–901, 1992.
- [13] M. Fernández-Guasti, E. Haro-Poniatowski, and S. Camacho López. Laser induced diffraction patterns in germanium diselenide amorphous films. *Appl. Optics*, 31(18):3453–3459, 1992.
- [14] M. Fernández-Guasti and M. De La Cruz Heredia. Diffraction pattern of a circle/square aperture. *Journal of Modern Optics*, 40(6):1073–1080, 1993.
- [15] D. Iturbe-Castillo, M. Fernández-Guasti, and J.J. Sánchez Mondragón. Láser de pigmento con retroalimentación distribuida: generación de pulsos ópticos de hasta 74 ps. *Rev. Mex. Fís.*, 39(2):214–228, 1993.
- [16] M. Fernández-Guasti, J. L. Hernández-Pozos, E. Haro-Poniatowski, and L. A. Julio Sánchez. Anomalous Conical Emission in Calcium Vapour. *Optics Comm.*, 108:367–376, 1994.
- [17] M. Fernández-Guasti, J. L. Hernández-Pozos, E. Haro-Poniatowski, and L. A. Julio Sánchez. Anomalous Conical Emission: Two-beam Experiments. *Phys. Rev. A*, 49(1):613–615, 1994.
- [18] E. Haro-Poniatowski, M. Fernández-Guasti, S. Camacho López, and F. Ruiz. Phase Conjugation and Spatial Grating Formation in Amorphous Selenium. *Physica A*, 207:329–333, 1994.
- [19] L. Ponce, M. Fernández-Guasti, E. Jiménez, and E. Haro-Poniatowski. Obtención de capas delgadas por ablación láser. *Revista Mexicana de Física*, 40(4):798–804, 1994.
- [20] E. Haro-Poniatowski, M. Fernández-Guasti, S. Camacho López, A. Gil-Villegas, and J. González Hernández. Thickness Dependence of the Phase Conjugate Signal of Amorphous Selenium Thin Films. *Optics Communications*, 119:154–158, 1995.
- [21] M. Fernández-Guasti, E. Haro-Poniatowski, R. Diamant, L. Ponce, and E. Jiménez. Pulsed Laser Deposition of Selenium. *Journal of Materials Science*, 30:6253–6256, 1995.
- [22] M. Fernández-Guasti and A. Cornejo-Rodríguez. Analytical study of the Optical Parameters for a Multiple Path Telescope. *Applied Optics*, 34(16):2908–2913, 1995.
- [23] J. Castro-Flores, S. Vázquez-Montiel, A. Cornejo-Rodríguez, and M. Fernández-Guasti. Multiple path telescope : Third Order Design. *Applied Optics*, 36:6399–6402, 1997.
- [24] J.C. Alonso, R. Diamant, E. Haro-Poniatowski, M. Fernández-Guasti, G. Muñoz, I. Camarillo, M. Jouanne, and J. F. Morhange. Raman Characterization of Bi<sub>12</sub>SiO<sub>20</sub> thin films obtained by pulsed laser deposition. *Applied Surface Science*, 109:359–361, 1997.

- [25] J.C. Alonso, E. Haro-Poniatowski, R. Diamant, M. Fernández-Guasti, and M. García. Photo luminescent Thin Films of Terbium Chloride doped Yttrium Oxide Deposited by the Pulsed Laser Ablation technique. *Thin Solid Films*, 303:76–83, 1997.
- [26] T. Flores, L. Ponce, B. Moreno, M. Arronte, M. Fernández-Guasti, and C. García. Nd :YAG laser in art works restoration. *Rev. Metal. Madrid*, 34:98–100, 1998.
- [27] R. Diamant, L. Ponce, M. Fernández-Guasti, and E. Jiménez. Plasma Dynamics and its relationship with thin film properties of PLD CdTe via Pulsed Laser Deposition. *Applied Physics B*, 66(5):639–643, 1998.
- [28] E. Haro-Poniatowski, M. Jouanne, J. F. Morhange, C. Julien, R. Diamant, M. Fernández-Guasti, G. A. Fuentes, and J.C. Alonso. MicroRaman characterization of WO<sub>3</sub> and MoO<sub>3</sub> thin films obtained by pulsed laser irradiation. *Applied Surface Science*, 127:674–678, 1998.
- [29] A. Arrieta, S. Mera, R. Diamant, M. Fernández-Guasti, R. Sosa, L. Escobar-Alarcón, A. F. Muñoz, and E. Haro-Poniatowski. Synthesis and characterization of sodium chloride thin films obtained by pulsed laser deposition. *Applied Physics A*, 69:S491–S493, 1999.
- [30] R. Diamant, E. Jiménez, E. Haro-Poniatowski, L. Ponce, M. Fernández-Guasti, and J.C. Alonso. Plasma dynamics inferred from the optical emission spectra during diamond-like thin film pulsed laser deposition. *Diamond and Related Materials*, 8:1277–1284, 1999.
- [31] L. Escobar-Alarcón, E. Haro-Poniatowski, M.A. Camacho-López, M. Fernández-Guasti, J. Jiménez-Jarquín, and A. Sánchez-Pineda. Growth of rutile TiO<sub>2</sub> thin films laser ablation. *Surface Engineering*, 15(5):411–414, 1999.
- [32] L. Escobar-Alarcón, M. Villagrán, E. Haro-Poniatowski, J.C. Alonso, M. Fernández-Guasti, and E. Camps. Thin film deposition of transparent materials by rear side laser ablation: a novel configuration. *Applied Physics A*, 69:S583–S586, 1999.
- [33] L. Escobar-Alarcón, E. Haro-Poniatowski, M. Fernández-Guasti, A. Pe-rea, C.N. Afonso, and T. Falcón. Structural and optical properties of Bi<sub>12</sub>SiO<sub>20</sub> thin films obtained by pulsed laser deposition. *Applied Physics A*, 69:S949–S952, 1999.
- [34] L. Escobar-Alarcón, E. Haro-Poniatowski, M.A. Camacho-López, M. Fernández-Guasti, J. Jiménez-Jarquín, and A. Sánchez-Pineda. Structural characterization of TiO<sub>2</sub> thin films obtained by pulsed laser deposition. *Applied Surface Science*, 137:38–44, 1999.

- [35] M. Fernández-Guasti, A. Gil-Villegas, and R. Diamant. Ermakov equation arising from electromagnetic fields propagating in 1D. *Revista Mexicana de Física*, 46:530–535, 2000.
- [36] M. Fernández-Guasti. El teorema de Poynting para campos complejos. *Revista Mexicana de Física*, 47:105–106, 2001.
- [37] E. Camps, L. Escobar-Alarcón, E. Haro-Poniatowski, and M. Fernández-Guasti. Spectroscopic studies of two perpendicularly interacting carbon plasmas generated by laser ablation. *Appl. Surface Science*, 197:239–245., 2002.
- [38] M. Fernández-Guasti and A. Gil-Villegas. Orthogonal functions invariant for the time dependent harmonic oscillator. *Physics Letters A*, 292:243–245., 2002.
- [39] M. Fernández-Guasti and A. Gil-Villegas. Exact and adiabatic invariant for the time-dependent harmonic oscillator. In A. Macias, F. Uribe, and E. Diaz, editors, *Developments in mathematical and experimental physics*, volume C of *C: Hydrodynamics and dynamical systems*, page 159–166. Kluwer academic, 2003.
- [40] H. Moya-Cessa and M. Fernández-Guasti. Coherent states for the time dependent harmonic oscillator. *Physics Letters A*, 311:1–5, 2003.
- [41] M. Fernández-Guasti and H. Moya-Cessa. Solution of the Schrödinger equation for time dependent 1D harmonic oscillators using the orthogonal functions invariant. *J. Phys. A: Math. Gen.*, 36(8):2069–2076, 2003.
- [42] M. Fernández-Guasti and H. Moya-Cessa. Amplitude and phase representation of quantum invariants for the time dependent harmonic oscillator. *Physical Review A*, 67(063803):063803–1–5, 2003.
- [43] M. Fernández-Guasti, J. L. Jiménez, F. Granados-Agustín, and A. Cornejo-Rodríguez. Amplitude and phase representation of monochromatic fields in physical optics. *JOSA A*, 20(8):1629–1634., 2003.
- [44] M. Fernández-Guasti, R. F. Alonso-Pinzón, and E. Haro-Poniatowski. Image reconstruction via phase conjugation in amorphous chalcogenide thin films. *Optics Communications*, 221:37–42, 2003.
- [45] M. Fernández-Guasti. Analytic approximation to the harmonic oscillator equation with a sub-period time dependent parameter. *Physica D: Nonlinear phenomena*, 189:188–198, 2004.
- [46] M. Fernández-Guasti. Complementary fields conservation equation derived from the scalar wave equation. *J. Phys. A: Math. Gen.*, 37:4107–4121, 2004.

- [47] M. Fernández-Guasti. Blending Two Major Techniques in Order to Compute  $\pi$ . *International Journal of Mathematical Education in Science and Technology*, 36:85–92, 2005.
- [48] M. Fernández-Guasti, A. Meléndez Cobarrubias, F.J. Renero Carrillo, and A. Cornejo-Rodríguez. LCD pixel shape and far field diffraction patterns. *Optik*, 116:265–269, 2005.
- [49] J. Jiménez-Jarquín, M. Fernández-Guasti, E. Haro-Poniatowski, and J. L. Hernández-Pozos. IR and UV laser-induced morphological changes in silicon surface under oxygen atmosphere. *physica status solidi (c)*, 2(10):3798 – 3801, 2005.
- [50] M. Fernández-Guasti. Indeterminacy of amplitude and phase variables in classical dynamical systems: the harmonic oscillator. *Europhysics Letters*, 74(6):1013–1019, 2006.
- [51] J. M. Vargas-Martínez, H. Moya-Cessa, and M. Fernández-Guasti. Normal and anti-normal ordered expressions for annihilation and creation operators. *Revista Mexicana de Física*, 52(1):13–16, 2006.
- [52] M. Fernández-Guasti. Attainable conditions and exact invariant for the time-dependent harmonic oscillator. *J. Phys. A: Math. Gen.*, 39:11825–11832, 2006.
- [53] A. Silva-Pérez, J.R. Godínez-Fernández, M. Fernández-Guasti, and E. Haro-Poniatowski. *Espectroscopía de fluorescencia inducida por láser en células*, page 487–508. El Colegio Nacional, 2006.
- [54] H. Moya-Cessa and M. Fernández-Guasti. Time dependent quantum harmonic oscillator subject to a sudden change of mass: continuous solution. *Revista Mexicana de Física*, 53(1):42–46, 2007.
- [55] M. Fernández-Guasti. Péndulo de longitud variable: experimentos. *Revista Mexicana de Física E*, 53:120–126, 2007.
- [56] M. Fernández-Guasti. *Nonlinear Phenomena Research Perspectives*, chapter 6 - The Nonlinear Amplitude Equation in Harmonic Phenomena, page 177–223. Nova Publishers, 2007.
- [57] M. Fernández-Guasti. The Wronskian and the Ermakov - Lewis invariant. *International Mathematical Forum*, 4(16):795 – 804, 2009.
- [58] M. Fernández-Guasti and C. Zagoya. How to obtain the Lorentz space contraction formula for a moving rod from a knowledge of the positions of its ends at different times. *European Journal of Physics*, 30(2):253–258, March 2009.
- [59] C. Zagoya and M. Fernández-Guasti. La contracción de Lorentz en relatividad especial. *Lat. Am. J. Phys. Educ.*, 3(1):117–120, January 2009.

- [60] R. Diamant and M. Fernández-Guasti. Light propagation in 1D inhomogeneous deterministic media: the effect of discontinuities. *J. Opt. A: Pure Appl. Opt.*, 11:045712 (8pp), 2009.
- [61] H. Moya-Cessa, M. Fernández-Guasti, S. Chávez Cerda, and V. Arriзон. Optical realization of quantum mechanical invariant. *Optics Lett.*, 34(9):1459–1461, 2009.
- [62] J. Jiménez-Jarquín, E. Haro-Poniatowski, M. Fernández-Guasti, and J. L. Hernández-Pozos. Laser induced microstructuring of silicon under different atmospheres. *Radiation Effects and Defects in Solids*, 164(7):443–451, 2009.
- [63] A. Silva-Pérez, J.R. Godínez-Fernández, M. Fernández-Guasti, E. Haro-Poniatowski, C. Campos-Muñiz, and L. Llorente. *Laser Induced fluorescence in mononuclear cells: direct estimate of the NADH bound/free ratio*, chapter 13, page 199–217. World Scientific, 2010.
- [64] M. Fernández-Guasti and A. Tec Chim. Charge motion under ultrafast harmonic wave switching. In M. Martínez-Mares and J. A. Moreno-Razo, editors, *Symposium on Condensed Matter Physics*, volume 1319 of *IV Mexican Meeting on Experimental and Theoretical Physics*, page 57–69. AIP conference proceedings, 2010.
- [65] G. Muñoz, C. García, M. Muñoz, and M. Fernández-Guasti. Mesa Holográfica pasiva ultra-estable: análisis de vibraciones. In *XXIII reunión anual de óptica*, sept 2010.
- [66] N. Atzin, M. Fernández-Guasti, and R. Diamant. Light Propagation at Soft Interface. The Wolfram Demonstrations Project, December 2010.
- [67] M. Fernández-Guasti. The necessity of two fields in wave phenomena. In *Optics and Photonics 2011*, volume 8121 of *The nature of light: What are photons? IV*, page 81210R–1–12. SPIE, 2011.
- [68] M. Fernández-Guasti and R. Diamant. Stratified media: nonlinear ODE is better. In *International commission for optics 2011*, volume 8011 of *ICO-22*, page 80116D–1–10. SPIE, 2011.
- [69] A. Cornejo-Rodríguez, S. Vázquez-Montiel, F. Granados-Agustín, D. Gale, R. Diamant, R. Espinasa-Perena, J.L. Cruz, and M. Fernández-Guasti. Xochicalco: Tlayohualchieliztli or Camera Obscura. In *International commission for optics 2011*, volume 8011 of *ICO-22*, page 80119O–1–13. SPIE, 2011.
- [70] M. Fernández-Guasti. Alternative realization for the composition of relativistic velocities. In *Optics and Photonics 2011*, volume 8121 of *The nature of light: What are photons? IV*, page 812108–1–11. SPIE, 2011.

- [71] M. Fernández-Guasti, H. Palafox, and R. Chandrasekar. Coherence and frequency spectrum of a Nd:YAG laser-generation and observation devices. In *Optics and Photonics 2011*, volume 8121 of *The nature of light: What are photons? IV*, page 81211E–1–10. SPIE, 2011.
- [72] M. Fernández-Guasti, E. Nava, F. Acosta, and R. Chandrasekar. Physical processes behind a Ti:Sa femtosecond oscillator. In *Optics and Photonics 2011*, volume 8121 of *The nature of light: What are photons? IV*, page 812118–1–10. SPIE, 2011.
- [73] F. Zaldivar, J. L. del Rio-Correa, E. Garcia-Martinez, and M. Fernández-Guasti. Composition of physical quantities in one dimension: Group-theoretic differentiable functions. *American Journal of Physics*, 79(10):1060–1063, 2011.
- [74] R. Diamant and M. Fernández-Guasti. Reflected wave atypical phase change at a boundary. In *International commission for optics 2011*, volume 8011 of *ICO-22*, page 80115U–1–6. SPIE, 2011.
- [75] M. Fernández-Guasti. Lagrange’s identity obtained from product identity. *Int. Math. Forum*, 7(52):2555–2559, 2012.
- [76] M. Fernández-Guasti. Green’s second identity for vector fields. *ISRN Mathematical Physics*, 2012:7, 2012. Article ID: 973968.
- [77] R. Diamant, A. García Valenzuela, and M. Fernández-Guasti. Reflectivity of a disordered mono-layer estimated by graded refractive index and scattering models. *JOSA A*, 29(9):1912–1921, 2012.
- [78] M. Fernández-Guasti, E. Nava, F. Acosta, and S. Camacho-López. Femtosecond Laser Cavity Characterization. In I. Peshko, editor, *Laser Pulses - Theory, Technology, and Applications*, page 35–72. Intech, 2012.
- [79] M. Fernández-Guasti and R. Diamant. Generalización de la relación de Snell del ángulo de refracción. *Opt. pura y appl.*, 45(3):377–385, 2012.
- [80] M. Fernández-Guasti and F. Zaldivar. An elliptic non distributive algebra. *Adv. Appl. Clifford Algebras*, 2013. in print.
- [81] R. Diamant and M. Fernández-Guasti. Phase Change of Light Reflected by a Discontinuity in the Derivatives of the Refractive Index. *Optics Comm.*, 294:64–72, 2013.
- [82] M. Fernández-Guasti. Escultura métrica: escatores imaginarios en 1+2 dimensiones y la escala humana. In H. Dieterich, editor, *Cyberspace and the Quest for a Materialistic Epistemology of Liberation*, pages 141–148. Druck and Verlag GmbH, 2013.
- [83] M. Fernández-Guasti. Fractals with hyperbolic scators in 1+2 dimensions. *Fractals*, 2013. submitted: FRACTALS-D-12-00044.



- [84] M. Fernández-Guasti and F. Zaldívar. A hyperbolic non distributive algebra in 1+2 dimensions. *Adv. Appl. Clifford Algebras*, 23(3):639–653, 2013.
- [85] M. Fernández-Guasti. An intrinsically three dimensional fractal. *Int. J. of Bifurcation and Chaos*, 2013. Submitted IJBC-D-13-00144.
- [86] M. Fernández-Guasti. Time and space transformations in a scator deformed lorentz metric. *Found. Phys.*, 2013. Submitted found. phys.
- [87] M. Fernández-Guasti. Evolution of cyberspace: Categories that can be transfered without loosing them. . In H. Dieterich, editor, *Cyberspace and the Quest for a Materialistic Epistemology of Liberation*. Druck and Verlag GmbH, 2013. in print.