CURRICULUM VITAE

Biodata

Nombre: Henryk Gzyl Buchholz

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Títulos

Licenciado en Física
Universidad Central de Venezuela, 1963-1967
Ph. D in Mathematics
University of California at San Diego, 1971-1975.

Cargos Académicos

Profesor Titular (desde 1983) en la Escuela de Física y Matemáticas, Facultad de Ciencias, Universidad Central de Venezuela.
Profesor Titular (Sept. 1998 – Sept. 2004, Sept 2005-Sept. 2007.) en el Depto. de Cómputo y Estadística, Univ. Simón Bolívar.
Catedrático invitado, Departamento de Estadística, Universidad Carlos III de Madrid. Sept. 2004 – Sept. 2005. Oct.-Nov. 2010.
Profesor invitado, Depto. de Métodos Cuantitativos, Facultad de Economía, Universidad de Navarra, Abril-Junio 2007 a 2010.
Cargo actual: Profesor invitado, Centro de Finanzas, IESA, Caracas. Desde 2007 hasta el presente.

Años Sabáticos

1982-1983. Mathematical Center (CWI), Amsterdam
1989-1990. Departamento de Matemáticas, UAM, Madrid.

Áreas de Interés

Teoría de Probabilidades y sus Aplicaciones en Ecuaciones Diferenciales y en Matemáticas Financieras, Problemas Inversos, Modelos Matemáticos, Matemáticas Financieras.

Experiencia Docente

Amplio espectro de cursos dictados en las licenciaturas y en los postgrados en Física y en Matemáticas en ambas instituciones.

Otras Actividades

Arbitro Ocasional para: Physical Review A, Hadronic Journal, Journal of Transport Theory and Stat. Physics, Acta Científica Venezolana, Mathem. of Oper. Research, Comm. in Stochastics, Quantitaive Finance, Methodology and Computing in Applied Probability.
Reseñista ocasional de libros para: Mathematical Revs., Zentralblatt f. Mathematik, Acta Applic. Mathematicae.

Conferencias Invitadas

Conferencista Invitado en: IX Conf. Stochastic Processes an Applic. Evanston, Illinois, 1979.
III-rd ORSA meeting, Boca Raton, Florida, April, 1995.
RotaFest, Umbral Calculus Session, MIT, Boston,1996
Minicurso en Maxent 2002, Moscow, Idaho, Agosto 2002.
Escuela Venezolana de Matemáticas, Mérida. Sept.1988.
Escuela Venezolana de Matemáticas, Mérida. Sept.1998.
Escuela Venezolana de Matemáticas, Mérida. Sept.2006.
Coloquio Internacional de Estadítica. Medellín, Junio 2011.

Premios: Premio Nacional de Ciencias, (Área: Matemáticas), 1993.

LISTA DE PUBLICATIONES CIENTIFICAS

1-) "Interpretación combinatoria de polinomios de tipo binomial". Acta Cient.. Venez. **27**, pp. 244-246 (1976).

2-) "Levy systems for time changed processes". Annals of Probability, **5**, pp.565-570 (1977).

3-) "Poblaciones en. medios aleatorios: modelos simples". Acta Cient.Venez. **26**, 224-225.

4-) "On entrance-exit distributions of Markov processes" (con C. Betz) Jour. App. Prob. **15** , pp. 78-86 (1978).

5-) "On generators of subordinate semigroups". Annals of Probab.. **6**, No. 6, 975 - 983. (1978),

6-) "Occupation time sets of supports of continuous additive functionals", (con C. Betz). Annals Inst. Henri Poincaré , **15,** No.1, p. 41 -50, (1979)

7-) "Quantum systems subject to random pulses", Jour. Math. Phys. **18,** pp. 1327-l329 (1980).

8-) "Infinitesimal generators of time changed processes". Annals of Probability, **8**, No.4 p p.716-726 (1980).

9-) "Some relations between exit measures hitting measures and Levy systems for standard processes". Acta Cient.Venez, **30**, No. 2, pp.328-330 (1979).

10-) "A unified presentation of equilibrium distributions in classical and quantum mechanics". Annals Inst Henri Poincaré**, 32**, pp. 175-183 (1980).

ll-) "On the probabilistic solution of a non-Homogeneous Cauchy Boundary Value Problem". Acta Cient. Venez., **30**, pp. 440-4451980.

12-) "0n Blume's integration of Schroedinger's equations for a quantum system subject to Random Pulses", Jour. Math. Phys., **20** No. 8, pp. 1174-1175(1979).

13-) "A necessary condition for the existence of global solutions $dX_t = a(X_t)dB_t$" (con C. Betz). Jour. Stoch. Proc. **11** ,pp. 313-31 5 (1981).

14-) "On the equivalence of some exact master equations". Jour. Stat. Phys. **26** No.4 (1981).

15-) "On an abstract averaging theorem". Acta Cient. Venez. **32,** pp. 282-283 (1981) .

16-) "Integration of the Boltzman equation in the relaxation time approximation", Journ. Stat. Phys. **29**, pp. 617-622 (1982).

17-) "Linearized Boltzman equations 1: Representation of solutions". Jour. Stat.Phys. 28 (1982) 165-171.

18-) "Quantization on the damped harmonic oscillator". Phys. Rev. **A.27** No.5 2297-2299 (1983).

19-) "Bounds for the first eigenvalue of a spherical cap". (w.C. Betz and G. Camera). Appl. Math. and Optimizat. **10** , pp.193-202 (1983).

20-) "Quantum mechanical solution of the linear filtering problem". Letters in Systems and Control. **3** , pp. 217-220 (1983).

21-) "On the computation of conditional probabilities". Acta Cient. Venz. **35,** pp. 79-80 (1984).

22-) "Evolution semigroups and hamiltonian flows". Jour. Math. Analysis and Applic. **110** , pp.316-332 (1985).

23, "Canonical transformations, umbral calculus and orthogonal theory". Jour. Math. Analysis and Applications. **111**, pp.547-558 (1985).

24-) "Integrable systems, their associated (semi-) groups and moment systems". Jour. Math. Analysis and Applications, **115**, pp.506-516 (1986).

25,) "A simple proof of Faa di Bruno's Formula". Acta Cient. Venez. **37**, No.2, pp.214-21 5 (1986).

26-) "Multidimensional extension of Faa di Bruno's formula and applications". Jour. Math, Analysis and Applications. 116, pp. 450-455 (1986).

27-) "Probabilistic methods for comparing first eigenvalues". (con C. Betz) Ann. Inst. Henri Poinceré, Vol. **21** No. 2 (1985) pp. 147-156.

28-) "Bounded vs. Free". Hadronic Jour., **8**, No.2, pp.119-120 (1985).

29-) "Perturbative and asymptotic expansions of exact memoryless master equations". (con L. Kababe). Acta. Phys. Polonica, **A691,** pp.167-177 (1986).

30-) "Non-unitary representations of canonical transformations and application to filtering theory". Vol. Conmemorativo de Acta Científica Venezolana, **30,** pp.620-624 (1987).

31-) “On the equivalence of Hamiltonians leading to Newtonian equations” (con L. A. Herrera). Hadronic Journal, **9**, pp.31-34 (1986).

32-) "On the integration of the Heisenberg equations of motion". Hadronic Journal. **9**, No.4, pp. 171-172 (1986).

33-) “Umbral calculus via integral transforms” Jour. Math. Analysis and Appl. **129** No.2, pp. 315325 (1988).

34-) "Kinetic equation for Ising model in a convolutionless formalism" (con L. Kabbabe). Acta Physica Polonica. **A72**, pp.721-727(1987).

35-) "Removing ambiguities in some classical and quantum descriptions of a particle in a magnetic field". Hadronic Journal. Vol **9**, 177-179.

36-) "Characterisation of vector valued, Gaussian, stationary Markov processes". Lettters in Probability and Statistics. **6**, pp. 17-19 (1987).

37-) "Diffusions on some submanifolds of euclidean spaces". Letters in Prob. and Statistics. **10,** pp.311-315 (1990).

38-) "The Feynman-Kac formula and Hamilton-Jacobi equation". Jour. Math. Analysis and its Applications,**142**, pp.79-82 (1989).

39-) “On the physicists approach to the travelling salesman problem”. (con R Jimenez) Mathl. and Comp. Mod. **12** pp. 667-670 (1989

40-) “Classical limits via brownian motion” Appeared in Commemorative Vol.**100** of Fac. Ciencias U.L.A. (w. J.R.León) (1989)pp.83-90.

41m) "Linear programming with maximum entropy" Mathl. and Computer Modeling. (con F. Gamboa). **13** ,pp. 49-52(1990)

42-) “Probabilistic representation of solutions of wave equations". (con R. Jim6nez) Math. and Computer Modelling, **13** p. 57-65 (1990).

43-) “On the physicists approach to the travelling salesman problem II". Mathl. and Comp. Modelling (con R Jiménez. and A.Quiroz) **13**, pp. 45-48 (1989).

44-) "The maxent approach to linear programming with quadratic errors" Mathl. and Computer Modelling. **15**, pp. 43-45 (1990).

45-) “Probabilistic representation of solutions of wave equations. II: Boundary value problems". Mathl. and Computer Modelling. **13** pp. 67-76 (1990).

46-) “Probabilistic approach to wave propagation problems III: Brownian local times and waves in layered media” Mathl. and Comp. Modelling. **<u>15,</u>** pp. 65-62 (1991).

47-) “Probabilistic methods for waves in heterogeneous media” IUTAM Symp. In Linear and non-linear waves. Bellomo, N. and Casciatti, F. (eds). Springer-Verlag, (1992),pp.266-272.

48-) “Diffusions and Waves” (con.. R Jiménez) Jour. Math. Analysis and Appl., **<u>174</u>** , pp. 498-517 (1993)

49-) "Probabilistic representation of solutions of wave equations IV: Reflecting boundaries". Mathl. and Comp. Mod. (con C. Betz) **<u>15</u>**, pp. 129.140 (1991)

50-) "From the heath to the wave equations" (w. R. Jiménez) Math. and Comp. Modelling, **<u>16,</u>** pp. 69-71 (1992)

51-) “Probabilistic representation of solutions to wave equations V: a collection of examples”. Mathl and Computer Modelling.(con C. Betz and R. Jiménez)**<u>16,</u>** pp. 165-176 (1992).

52-) “A path integral approach for solving Euler’s equation describing the oscillations of an infinite bar”. Mathl. and Comp. Modelling, **<u>19,</u>** 119-124 (1994)

53-) “Hitting distributions and the Sommerfeld radiation condition” (con C. Betz) Jour. Math. Analysis and Appl., **<u>182</u>** pp.301-308 (1994).

54-) “Hitting Spheres from the exterior” (w. C. Betz), Ann. Of Probab. **<u>22,</u>** pp. 177-179 (1994)

55-) “Paradigmas Predictivos: predicción en régimen caótico” Interciencia, Vol. 20,p37-39,1995.

56-) “Maxentropic reconstruction of Fourier and Laplace transforms” Appl. Math and Comp.,Vol. **73**, pp.181-189 (1995).

57-) “Maxentropic reconstruction of Fourier and Laplace Transforms under non-linear constraints” Appl. Math and Comp. Vol. **25** (1997), pp. 117-126.

58-) “On a maxentropic procedure for reconstructing a distribution from its marginals” (w. B. Herrero) Mathl. and Comp. Modelling. Vol. **24** (1996), pp. 83-89.

59-)“Maxentropic solutions of linear Fredholm equations” (con F. Gamboa). Mathl. & Comp. Modelling, Vol. **25**, pp.23-32 (1997)

60-) “Maxentropic analysis of of linear programming problems” (con F. Moreno) Mathl. & Computer Modelling. Vol.**26** (1997) pp.107-116.

61-) “The Weierstrass approximation theorem and large deviations” (con J.L Palacios) Amer. Mathem. Montlhy. Vol.**104**(1997,pp.656-659.

62-) “Parameter estimation in superpositions of decaying exponentials” (con C. Chang) Appl. Math. & Computation, Vol.**96** (1998)pp.101-116.

63-) Maxentropic reconstructions in the presence of noise. "Maximum Entropy and Bayesian Methods", Vol. **17**, Erickson, G. and Ryckert, J.(eds) , Kluver Pubs, 1998.

64-)”Maxentropic reconstruction with uncertainty in the data and varying a priory information” (w. Y. Velasquez) Mathem. and Computer Modelling, Vol. **29** (1999)pp.79-86.

65-)”A comparative study of some reconstruction methods for linear inverse problems” (w. A. Tagliani y Y. Velásquez), Computer and Mathem. Modeling, Vol **30** (1999)pp. 159-167

66-) “The role of a priori information in maxentropic reconstruction in the mean” (w. Y. Velásquez). Applied Math. and Comput. Vol. **109** (2000)pp.101-119.

67-) Gzyl, H. “Linear reconstruction problems with convex constraints: influence of the a priori data” (with Y. Velásquez) . Applied Mathematics and Computation. Vol. 109, pp. 189-198.

68-) “Maxentropic characterization of some probability distributions” Studies in Applied Math. Vol **105** (2000) pp235-243.

69-) "Probabilistic remarks in the theory of scattering by soft obstacles" Studies in Applied Math. Vol.**105** (2000)pp.375-384.

70-) “Maxentropic construction of risk neutral measures” Applied Math. Finance. Vol **7** (2000) pp.229-239.

10-)"Maxentropic reconstruction by first order splines" (w. Y. Velásquez) "Maximum Entropy and Bayesian Methods" AIP- **CP 547**,J.Ryckert, Erickson, G. and Smith, G. (eds) Amer. Inst. of Phys., (2001) pp.181-196.

. 72-)"Inverse problems for the acoustic wave equation: a probabilistic approach to uniqueness and approximation". Applied Math. and Comput. Vol. **122** (2001)pp. 179-194.

73-) “Maxentropic interpolation by cubic splines with possibly noisy data” (w. Y. Velásquez) in Maximum Entropy and Bayesian Methods”. A. Mohammad-Djafari(ed.) AIP-**CP568**,2001,pp216-228.

74-) “A generalized maxentropic inversion procedure for noisy data” (with A Golan) Applied Math. and Computation, Vol. **127** (2002)pp.249-260

75-) “Tomographic reconstructions by maximum entropy” Appl. Math. and Computation.
Vol. 129(2002) 157-169.

65-)“Reconstruction of transition probabilities by maximum entropy in the mean” (w. Yurayh Velasquez) Maximum Entropy and Bayesian Methods, AIP CP Vol**.617**(2002),192-203.

77-) “Maxentropic determination of minimum energy states from partial observation” (w M. Diasparra) Maximum Entropy and Bayesian Methods, AIP- CP Vol.**617**(2002), 322-330

78-) “On Poisson-Dirichlet problems with polynomial data” Publications Matemátiques. Vol. 46 (2002),465-471.

79-) “Entropic approach to interior point solution of linear programs” (w. M.Diasparra) Appl. Math. and Comp., Vol. 143 (2003) pp.339-347.

80-) “Ill-posed linear inverse problems and maximum entropy in the mean” Acta Científica Ven. Vol. 53 (2002) 71-90.

81-) “Probabilistic approach to an image reconstruction problem” (w. Noam Zeev) Methodology and Comp. in Appl. Probab. **4** (2002) 307-318.

82-) “A perturbative approach for reconstructing diffusion coefficients” (w. M. Villasana) Appl. Math. and Computation (2004)

83-) “Priors and Information-Theoretic Estimation “ (with Amos Golan) Proceedings of the American Statistical Association Business and Economic Section, IEE Conference (2003)

84-) “On the approximation properties of Bernstein polynomials via probabilistic tools” (w. J.L. Palacios) Bol. Asoc. Matem. Venezolana. Vol.X, (2003)pp.5-13.

85-) “Maximum Entropy in the Mean: A useful tool for constrained linear problems” (A tutorial) Bayesian Inference and Maximum Entropy, Am. Inst. Phys., CP 695,(2003) pp. 361-385

86-) “Geometry and exponential coordinates for probabilities on a finite set” Bayesian Inference and Maximum Entropy, Am. Inst. Phys., CP **375** (2004) pp. 481-492.

87-) “Maxentropic solution of fractional moment problems” (with Inverardi, Tagliani y Villasana) **173** (2006) pp. 109-125.

88-) “Classical analogues of quantum paradoxes” Aparecido en Boletin de la AMV, 2004.

89-) “Geometry on the space of probabilities I: the finite dimensional case” (with L. Recht) Revista Matemática Iberoamericana. **22**, pp (2006) pp.545-558.

90-) “Geometry on the space of probabilities II: projective spaces and exponential families” (with L. Recht) Revista Matemática Iberoamericana. **Vol 3** (2006), 833-849.

91-) “An exposé on discrete Wiener chaos expansions” Boletin de la AMV, **XIII**, No 1, (2006) pp. 3-25.

92-) “A new bound on discrete distributions based on maximum entropy” AIP. CP. **872**, pp. 425-432 (2006)

93-) “Intrinsic geometry on the class of probability densities and exponential families” (with L. Recht) Publications Matematiques., Vol. 51 (2007) 309-332.

94-) “In search of the best approximant” (with P.L Novi-Inverardi y Aldo Tagliani) Appplied Mathematics and Computation, Vol. 189 (2007), pp.652-661.

95-) “On a relationship between distorted and spectral risk measures” (con Silvia Mayoral) Revista de Economía Financiera, ,**15** (2008), pp. 8-21.

96-) "Geometry on the space of positive functions" (with Lazaro Recht) Boletin de la Asociación Matemática Venezolana, **XIV** (2007) pp 15-26.

97-) “Determination of risk measures from market prices of risk” (with Silvia Mayoral) Insurance: Mathematics and Economics, **43** (2008) 437-443.

98-) “Determination of the joint probability distribution of a family of binary random variables. Applications to risk measurement” (with Aldo Tagliani) The Wilmott Magazine July (2008) pp 64-69.

99-) “Bayesian Parameter Inference for Assets in models of the Black & Scholes type” (con Enrique ter Horst and Samuel Malone) Applied Stochastic Models in Business and Industry, Volume 24 Issue 6, November 2008

100-) “Recovering decay rates from noisy measurements with maximum entropy in the mean” (con Enrique ter Horst) Journal of Probability and Statistics, **2009** (2009), pp. 1-13

101-) “A proposal for a new bound for discrete distributions” (con P.L Novi-Inverardi y Aldo Tagliani) Communications in Satistics: Theory and Methods. 37 (2008) pp.2149 - 2161

102-) “Inverse problems for random walks on trees: network tomography” (with Victor de la Peña y Patrick McDonald) Statistics and Probability Letters **78** (2008) pp3176-3183.

103-) "Assessment and Propagation of Input Uncertainty in Tree-based Option Pricing Models" (with Germán Molina and Enrique ter Host) Applied Stochastic Models in Business and Industry, Volume 25 Issue 3, May 2009

104-) “Hitting time and inverse problems for Markov chains” (with Victor de la Peña y Patric Mc Donald) Journal of Applied Probability , **45** (2008)pp 640-649.

105-) “A method for determining risk aversion functions from uncertain market prices of risk” with Silvia Mayoral Insurance: Mathematics and Economics, **47** (2010) 84_89

106-) “Stieltjes moment problem and fractional moments” (con Aldo Tagliani) Applied Mathematics and Computation, **216** (11), (2010) 3307-318.

107-) “A concentrated non-linear information theoretic estimator for the sample selection model” (Con Amos Golan) ENTROPY **2010**, 12(6), 1569-1580; doi:10.3390/e12061569

108-) “Stochastic volatility models including open, close, high and low prices” (con E. ter Horst, G. Molina y A. Rodríguez) Quantitative Finance, **12,** Issue 2, 2012, 199-212

109-) “Hausdorf moment problem and fractional moments” ” (Con Aldo Tagliani) Applied Mathematics and Computation, **216**, Issue 11, pp. 3319-3328

110-) “Determination the distribution of total loss from the moments of its exponential” The Journal of Operational Risk, 2011, **6**/Number 3, 3-13.

111-) “Determination of the probability distribution measures form market option prices using the method of maximum entropy in the mean” (Con Silvia Mayoral) Applied Mathematical Finance (2012)

112-) “Computing the value-at- risk of aggregate severities” Journal of Operational Risk, **6/**Number 4 (2011) , 1-5.

113-) “An entropic linear estimator for inverse problems” (con Amos Golan) Entropy, **14**, (2012) 114-) “Reconstructing heavy-tailed distributions by splcing with maximum entropy in the mean” (con Santiago Carrillo y Aldo Tagliani) Journal of Operatinal Risk, **7**(2) (2012) pp. 1-13.

115-) “Fractional Moments and Maximum Entropy: Geometric Meaning” (Con Aldo Taliani y Pier L. Novi) Communications in Statistics, (2012)

116) “Determination of the total loss from the fractional moments of its exponential” (Con Aldo Tagliani y Pier L Novi.) Applied Mathematics and Computation 219, (4), 1 (2012) pp. 2124-2133

117) “A comparison of numerical approaches to determine severity of losses” (Con Aldo Tagliani y Pier L Novi.) Jour. of Operational Risk,**8**(1) (2013) pp.3-15.

118) “An A further extension of Osuna's model for psychological stress” (con E.E Osuna) Aceptado en Internat. Jour. Contem. Mathem. Sciences.

119) “The Laplace transform on the real line is truly ill conditioned” “(con Aldo Tagliani) Aceptado en Applied Mathematics and Computation.

120) “Determination of the probability of ultimate ruin by maximum entropy applied to fractional moments” (Con Aldo Tagliani) Aceptado en Insurance: Mathematics and Economics.

Libros

“*Hamiltonian Flows and Evolution Semigroups*”. Longman Academic Scientific and Technical Research Notes in Mathematics, 1995.

“The Method of Maximum Entropy”, World Scientific Publishers, 1995. Series: Advances in Mathem. for Applied Sciences.

"*Linear Inverse Problems: The Maxentropic Connection*". World Scientic Publishers, Singapore, 2011..

(Disponible en http://www.etjaynescenter.org/software.html)

"*Diffusions and Waves*". Publicado en la serie Mathematics and its Applications de Kluwer Acad. Pubs . Noviembre 2002.

Co-editor de *“Recent Advances in Applied Probability”,* Publicado por Springer-Verlag, Berlin, 2005.

Notas de curso

“*Derivados financieros: curso básico*”
Notas de curso dictado en las maestrías en la USB, en doctorado de la UC3M y en la XIX-Escuela Venezolana de Matemáticas. Publicado en la serie Libros Profesionales de El Nacional., 2007.

“*Fundamentos matemáticos de la teoría de riesgo financiero*”
Notas de curso sobre medición de riesgo. Cursos dictados en Caracas y Medellín..

“*Tasas de interés y derivados asociados”*(Con Alexander Silva) Notas de curso dictado en Caracas.

Libros Reseñados

“Point Process Models of Cavity Radiation and Detection” (S. K. Srinivasan)

“Disequilibrium and Self- Organisation ”. C.W. Kilmister (ed.)

“Noise Induced Transitions” by W. Horsthermke and R. Lefever.

“The Fokker-Plank Equation” by H. Risken.

"Information and Self- Organisation". by H. Haken.

"Introduction to Probabilistic Modelling" by Pierre Bremaud.

"The Mathematics of Random Phenomena" by P. Kree and C. Soize.

“Stochastic equations for Complex Systems”. by A. Skorohod.

“Modelling Dynamical Phenomena in Cellular Biology” by L.A.

“Mathematical Biology” by J. D. Murray.

“A Maximum Entropy Collection” (5 Vols.).

“An Applied Mathematics Collection” (6 Vols.).

"A Mathematics Collection " (13 Vols.).

“Chaos in Quantum and Classical Mechanics” (M. Gutzwiler)

“Chaotic Dynamics in Economic Models” (C. Hommes)

“Chaos and Socio Spacial Dynamics” (D. Dedrinos and M. Sonis)

“The Transition to Chaos” (L. Reichl)

“The generalized Feller Equation and related Topics) (S. K. Lehnigk)

“Probability Theory” (V. Borkar)

“Regularizatiuon of Inverse problems” (Engel, Hanke & Neubauer)

"Random Evolutions and their Applications" (A. Swishchuk)

“Short memory linear processes and econometric applications” (K.T. Mynbaev)