

Curriculum Vita

Name : Richard C. Churchill

Title : Full Professor

Academic Affiliations :

Department of Mathematics and Statistics
Hunter College of the City University of New York (CUNY)
695 Park Avenue
New York, New York 10021 USA

Graduate Center - CUNY

Department of Mathematics and Statistics
University of Calgary
Calgary, Alberta, Canada, T2N 1N4
(Adjunct Professor : 1997 - present)

Higher Education :

George Washington University	B.A. Mathematics	1965
University of Wisconsin - Madison	M.S. Actuarial Science	1966
University of Wisconsin - Madison	M.A. Mathematics	1969
University of Wisconsin - Madison	Ph.D. Mathematics	1971

Teaching Experience at Other Institutions :

University of Calgary 9/8-12/87 - Visiting Full Professor
Graduate Center - CUNY 9/82 - present - Full Professor
SUNY at Albany - 9/73 - 8/74 - Visiting Assistant Professor
University of Wisconsin - Madison - 1966-1969, 1970-71 - Teaching
Assistant

Refereed Publications :

- Filtration-preserving mappings and centralizers within graded Lie algebras, *Proceedings of the Royal Society of Edinburgh*, **139A**, 961-996 (2009) (with M. Bendersky and G. Chen).
- Irreducibility criteria for skew-polynomials, *Journal of Algebra*, **322**, (2009), 3797-3822 (with Y. Zhang).
- A spectral sequence approach to normal forms, In: Adem, A., Pastor, G., Gonzalez, J. (Eds.), *Recent Developments in Algebraic Topology*, In : *Contemporary Mathematics*, Vol. **407**, Am. Math. Soc., Providence, RI, 2006 (with M. Bendersky).
- Normal forms in a cyclically graded Lie algebra, *J. Symb. Comp.* **41**, (2006), 633-662 (with M. Bendersky).
- Cyclic Vectors, in *Differential Algebra and Related Topics*, (L. Guo, P.J. Cassidy, W.F. Keigher & W.Y. Sit, eds.), World Scientific, Singapore (2002), 191-218 (with J. Kovacic).
- Differential Algebraic Techniques in Hamiltonian Dynamics, in *Differential Algebra and Related Topics*, (L. Guo, P.J. Cassidy, W.F. Keigher & W.Y. Sit, eds.), World Scientific, Singapore (2002), 219-256.
- Two generator subgroups of $SL(2, \mathbf{C})$ and the hypergeometric, Riemann and Lamé equations, *J. Symb. Comp.* **28**, (1999), 521-546.
- A unified approach to linear and nonlinear normal forms for Hamiltonian systems, *J. Symb. Comp.* **27**, (1998), 49-131 (with M. Kummer).

- The annular twist mapping of the restricted three body problem, *J. Dynamics and Differential Equations*, **9**, (1997), 249-268 (with M. Kummer).
- On the infinitesimal geometry of integrable systems, in *Mechanics Day*, (W.F. Shadwick, P.S. Krishnaprasad & T.S. Ratiu, eds.), Fields Institute Communications **7**, Am. Math. Soc., Providence (1996), 5-56 (with A. Baider, D.L. Rod and M. Singer).
- Group-theoretic obstructions to integrability, *Ergod. Th. & Dynam. Sys.* **15**, (1995), 15-48 (with D.L. Rod and M. Singer).
- On the determination of Ziglin monodromy groups, *SIAM J. Math. Analysis* **22**, (1991), 1790-1802 (with D.L. Rod).
- Monodromy and non-integrability in complex Hamiltonian systems, *J. Dynamics and Differential Equations* **2**, (1990), 451-481 (with A. Baider and D.L. Rod).
- On monodromy groups of second order Fuchsian equations, *SIAM J. Math. Analysis* **21**, (1990) (with A. Baider).
- On a result of Bruns, *Canadian Math. Bulletin* **33**, (1990), 1-6 (with M. Kummer and D.L. Rod).
- Unique normal forms for planar vector fields, *Math. Zeitschrift* **199**, (1988), 303-310 (with A. Baider).
- Geometrical aspects of Ziglin's non-integrability theorem for complex Hamiltonian systems, *J. Diff. Eq.* **76**, (1988) 91-114 (with D.L. Rod).
- Uniqueness and non-uniqueness of normal forms for vector fields, *Proc. of the Royal Soc. of Edinburgh* **108A**, (1988), 27-33 (with A. Baider).
- The Campbell-Hausdorff group and a polar decomposition of graded algebra automorphisms, *Pacific. J. Math.* **131**, (1986), 219-235 (with A. Baider).
- Heteroclinic and homoclinic orbits of reversible vector fields under perturbation, *Proceedings of the Royal Society of Edinburgh* **102A**, (1986), 345-363 (with D.L. Rod).

- On averaging, reduction and symmetry in hamiltonian systems, *J. Differential Equations* **49**, (1983), 359-414 (with M. Kummer and D.L. Rod).
- Pathology in dynamical systems III: analytic hamiltonians, *J. Differential Equations* **37**, (1983), 23-38 (with D.L. Rod).
- Stability transitions for periodic orbits in hamiltonian systems, *Arch. for Rat.Mech.and Anal.* **73**, (1980), 313-347 (with G. Pecelli and D.L. Rod).
- On the Poincaré criterion for asymptotic stability, *SIAM J. Math.Anal.* **10**, (1979), 1293-1298 (with J. Selgrade).
- Coexistence of stable and random motion, *Rocky Mt. J. of Math.* **7**, (1977), 445-456 (with G. Pecelli, S. Sacolick and D.L. Rod).
- Hyperbolic structures in hamiltonian systems, *Rocky Mt. J. of Math.* **7**, (1977), 439-444 (with G. Pecelli and D.L. Rod).
- Hyperbolic periodic orbits, *J. Differential Equations* **24**, (1977), 329-348 (with G. Pecelli and D.L. Rod).
- A geometric criterion for hyperbolicity of flows, *Proc. AMS* **62**, (1977), 137-143 (with J. Franke and J. Selgrade).
- A note on isoenergetic stability, *Int. J. Non-linear Mechanics* **12**, (1977), 37-43 (with E.S. Thomas, Jr. and H. Jurenka).
- Pathology in dynamical systems II: applications, *J. Differential Equations* **21**, (1976), 66-112 (with D.L. Rod).
- Pathology in dynamical systems I: general theory, *J. Differential Equations* **21**, (1976), 39-65 (with D.L. Rod).
- Isolated unstable periodic orbits, *J. Differential Equations* **17**, (1975), 329-348 (with G. Pecelli and D.L. Rod).
- Invariant sets which carry cohomology, *J. Differential Equations*, **13**, (1973), 523-550.

- Isolated invariant sets in compact metric spaces, *J. Differential Equations*, **12**, (1972), 330-352.

Conference Proceedings :

- Linear differential equations with symmetries, in *Ordinary and Partial Differential Equations, Volume V*, (P.D. Smith and R.J. Jarvis, eds.), Addison Wesley Longman, Essex, England (1997) (with D.L. Rod and B.D. Sleeman).
- The spring-pendulum system and the Riemann equation, in *New Trends for Hamiltonian Systems and Celestial Mechanics*, (E.A. Lacombe and J. Llibre, eds.), World Scientific, Singapore (1996) (with J. Delgado and D.L. Rod).
- Lax pairs in the Hénon-Heiles and related families, in *Hamiltonian Dynamical Systems: History, Theory, and Applications* (H.S. Dumas, K.R. Meyer and D.S. Schmidt, eds.), The IMA Volumes in Mathematics and Its Applications **63** (1995), 89-98, Springer-Verlag, New York (with G. Falk).
- A short course on chaotic hamiltonian systems, in *Deterministic Chaos in General Relativity*, (D. Hobill, A. Burl and A. Coley, eds.), NATO ASI Series B: Physics Vol. **332** (1994), 63-88, Plenum Press, New York.
- On defining chaos in the absence of time, in *Deterministic Chaos in General Relativity*, (D. Hobill, A. Burl and A. Coley, eds.), NATO ASI Series B: Physics Vol. **332** (1994), 107-112, Plenum Press, New York.
- Between integrability and chaos, in *Deterministic Chaos in General Relativity*, (D. Hobill, A. Burl and A. Coley, eds.), NATO ASI Series B: Physics Vol. **332** (1994), 103-105, Plenum Press, New York (with D.L. Rod).
- On Kovalevski exponents, in *Essays on Classical and Quantum Dynamics: A festschrift in Honor of Albert W. Saenz*, (H. Uberall and J.A. Ellison, eds.), Gordon & Breach, New York (1992) (with M. Kummer and D.L. Rod).

- On the applicability of Ziglin's non-integrability theorem, *Proceedings of the Workshop on Finite Dimensional Integrable Nonlinear dynamical Systems* (edited by P.G.L. Leach and W.H. Steeb), World Scientific Press, Singapore, 1988 (with D.L. Rod).
- A guide to the Hénon-Heiles hamiltonian, *Singularities and dynamical systems, Proceedings of the International Conference, Heraklion, Greece* (edited by S.N. Pneumatikos), Elsevier Science Publishers, Amsterdam, 1985 (with D.L. Rod).
- Harmonic oscillators at low energies, *Classical and Quantum Models and Arithmetic Problems* (edited by D. & G. Chudnovsky), Marcel Dekker Lecture Notes in Pure and Applied Mathematics, Vol 92, 239-286, Marcel Dekker, Inc., New York, 1984 (with D. Lee).
- On proving the non-integrability of a hamiltonian sytem, *The Riemann Problem, Complete Integrability and Arithmetic Applications* (edited by D. & G. Chudnovsky), Springer Lecture Notes in Mathematics, Vol. 925, 102-122, Springer-Verlag, New York, 1982.
- Normal modes and stability for some classes of mechanical systems, *Classical Mechanics and Dynamical Systems* (edited by R.L. Devaney and Z. Nitecki), Marcel Dekker Lecture Notes in Pure and Applied Mathematics, Vol 70, 13-24, Marcel Dekker, Inc., New York, 1981 (with G. Pecelli, D.L. Rod and E.S. Thomas, Jr.).
- A survey of the Hénon-Heiles Hamiltonian with applications to related examples, *Como conference Proceedings on Stochastic Behavior in Classic and Quantum Hamiltonian Systems* (edited by G. Casati and J. Ford), Springer Lecture Notes in Physics, Vol. 93, 76-136, Springer-Verlag, New York, 1979 (with G. Pecelli and D.L. Rod).

External Funding (recent) :

- NSF SCREMS Grant, 1996 - (with M. Bendersky, R. Thompson, A. Peluso and B. Shay)
- Several PSC-CUNY Research Grants
- NSF Research Grant, 1988-90 (with A. Baidier)

Professional Activities (recent) :

Referee for NSF, DOE, NSERC and various journals
Referee for promotion and tenure decisions
Reviewer for Math Reviews

Academic and Professional Honors :

Visiting Scholar, University of Calgary, Sumer 1979, 80, 81, 83, 86

Membership in Professional Societies :

American Mathematical Society
New York Academy of Sciences
Mathematical Association of America

Administrative and other service on behalf of the College (recent) :

Department Chair - 7/93-6/96
Member, College Retrenchment Committee, spring 1995 & spring 1996

Service to Larger Community :

SHAD Lectures - University of Calgary - 7 consecutive years

Record at Hunter College :

1/1982 - present - Full Professor
1/1975-12/1981 - Associate Professor
9/1974-12/1974 - Assistant Professor
9/1971 -8/1973 - Assistant Professor

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