

Curriculum Vitae

C. Denson Hill

Current Position

Professor of Mathematics
Department of Mathematics
Stony Brook University

Education

Rice University 1957-1961
B.A. 1961 Mathematics
Courant Institute, NYU
M.S. 1963, PhD 1966 Mathematics

Academic Employment

Rockefeller University
Research Associate 1965-1966, Assistant Professor 1966-1967
Stanford University
Assistant Professor 1967-1973
Stony Brook University
Associate Professor 1973-1975, Full Professor 1975-present

Temporary Positions

Cornell University, summer 1964
Assistant to Professor Mark Kac
Brookhaven National Laboratory, summers 1963, 1965, 1966
Visiting Assistant Mathematician
Universita di Pisa, 1970-1971
NATO Postdoctoral Fellow
Institute for Advanced Study, Fall 1974
Visiting Member
Universita di Firenze, 1979-1980
Visiting Professor
Naval Underwater Systems Center, summers 1986, 1987
Consultant
Steklov Institute, Moscow, summer 1992
Nat. Acad. Sc. Exchange Visitor

Visits of One Month or a Few Weeks

SISSA (Trieste), IVIC (Caracas), Paris VI (Paris), Institut Fourier (Grenoble),
Schroedinger Institute (Vienna), Humboldt University (Berlin), Institute for
Theoretical Physics (Warsaw), Mathematics Departments at: Pisa, Firenze,

Rome, Trento, Padova (Italy); Bonn, Berlin, Leipzig (Germany); Regina, London (Canada); Morellia (Mexico); Serra Negra (Brazil); Pittsburgh, San Diego, Chicago, Wisconsin (USA)

Professional Affiliations

MAA, AMS

Awards and Honors

BA degree Magna cum Laude (Rice)

Alfred P Sloan Research Fellowship (Stanford and Stony Brook)

NATO Research Fellowship (Pisa)

CNR Visiting Research Fellowship (Firenze)

National Academy of Sciences Exchange Fellow (Moscow)

Publications

1. *On the reflection of solutions of linear partial differential equations* , **PhD Thesis** , Courant Institute Math. Sc., NYU (1966).
2. *Parabolic equations in one space variable and the noncharacteristic Cauchy problem* , **Comm. Pure Appl. Math.**, **20** , 3 (1967), 619-633.
3. *A method for the construction of reflection laws for a parabolic equation* , **Trans. AMS**, **133** , 2 (1968), 357-372.
4. *Existence, uniqueness, stability, and monotone dependence in a Stefan problem for the heat equation (with J. R. Cannon)*, **J. Math. Mech.**, **17** , 1 (1967), 1-20.
5. *A multi-boundary Stefan problem and the disappearance of phases (with J. R. Cannon and J. Douglas, Jr.)*, **J. Math. Mech.**, **17** , 1 (1967), 21-34.
6. *Remarks on a Stefan problem (with J. R. Cannon)*, **J. Math. Mech.**, **17** , 5 (1967), 433-442.
7. *On the infinite differentiability of the free boundary in a Stefan problem (with J. R. Cannon)*, **J. Math. Anal. Appl.**, **22** , 2 (1968), 385-397.
8. *Continuous dependence of bounded solutions of a linear parabolic partial differential equation upon interior Cauchy data* , (with J. R. Cannon), **Duke Math. J.**, **35** , 2 (1968), 217-230.
9. *A finite-difference method for degenerate elliptic-parabolic equations (with J.*

R. Cannon), **SIAM J. Numer. Anal.**, **5**, 2 (1968), 211-218.

10. On the numerical solution of degenerate elliptic-parabolic equations , **SIAM J. Numer. Anal.**, **5**, 4 (1968), 717-724.

11. Linear functionals and the Cauchy-Kowalewski theorem , **J. Math. Mech.**, **19**, 3 (1969), 271-278.

12. A hyperbolic free boundary problem , **J. Math. Anal. Appl.**, **31**, 1 (1970), 117-129.

13. A sharp maximum principle for degenerate elliptic-parabolic equations , **Indiana Univ. Math. J.**, **20**, 3 (1970), 213-229.

14. On the movement of a chemical reaction interface (with J. R. Cannon), **Indiana Univ. Math. J.**, **20**, 5 (1970), 429-454.

15. The one-phase Stefan problem for the heat equation with boundary temperature specifications (with J. R. Cannon and M. Primicerio), **Arch. Rational Mech. Anal.**, **39**, 4 (1970), 270-274.

16. Complex characteristic coordinates and tangential Cauchy-Riemann equations (with A. Andreotti), **Ann. Scuola Norm. Sup. Pisa**, **26**, 2 (1972), 299-324.

17. E. E. Levi convexity and the Hans Lewy problem, Part I: Reduction to vanishing theorems (with A. Andreotti), **Ann. Scuola Norm. Sup. Pisa**, **26**, 2 (1972), 325-363.

18. E. E. Levi convexity and the Hans Lewy problem, Part II: Vanishing theorems (with A. Andreotti), **Ann. Scuola Norm. Sup. Pisa**, **26**, 4 (1972), 747-806.

19. Classical solutions in the large of a two-phase free boundary problem, I (with D. B. Kotlow), **Arch. Rational Mech. Anal.**, **45**, 1 (1972), 63-78.

20. Classical solutions in the large of a two-phase free boundary problem, II (with D. B. Kotlow), **Arch. Rational Mech. Anal.**, **47**, 5 (1972), 369-379.

21. A *Kontinuitätssatz* for ∂_M and Lewy extendibility , **Indiana Univ. Math. J.**, **22**, 4 (1972), 339-353.

22. A PDE in R^3 with strange behavior , **Indiana Univ. Math. J.** **22**, 5 (1972), 415-517.

23. The Cauchy problem for ∂ , **Proc. Symp. Pure Math. (PDE)**, **23**, AMS ,

Providence, R.I. (1973), 135-143.

24. On the maximum modulus principle for the tangential Cauchy-Riemann equations (with J. Carlson), **Math. Ann.**, **208**, (1974), 91-97.

25. A hierarchy of nonsolvability examples, **Proc. Symp. Pure Math. (Diff. Geom.)**, **27**, AMS, Providence, R.I. (1975), 301-305.

26. Mayer-Vietoris sequences for complexes of partial differential operators (with A. Andreotti, S. Lojasiewicz, and B. MacKichan), **Bull. AMS**, **82**, 3 (1976), 487-490.

27. The maximum modulus principle, I. Necessary Conditions (with D. Ellis and C. Seabury), **Indiana Univ. Math. J.**, **25**, 7 (1976), 709-715.

28. The maximum modulus principle for CR functions on smooth real embedded submanifolds on C^n (with D. Ellis), **Proc. Symp. Pure Math. (SCV)**, **30**, AMS, Providence, R.I. (1977), 139-140.

29. Function theory on tube manifolds (with M. Kazlow), **Proc. Symp. Pure Math. (SCV)**, **30**, AMS, Providence, R.I. (1977), 153-156.

30. The local family of analytic discs attached to a CR submanifold (with G. Taiani), **Proc. Conference on "Several complex variables and related topics in harmonic analysis"**, Cortona, Italy (1978), 166-179.

31. Hyperfunction cohomology classes and their boundary values (with B. MacKichan), **Ann. Scuola Norm. Sup. Pisa**, **4**, 3 (1977), 577-597. [Reprinted in the volume dedicated to J. Leray, Pisa, 1979.]

32. Families of analytic discs in C^n with boundaries on a prescribed CR submanifold (with G. Taiani), **Ann. Scuola Norm. Sup. Pisa**, **5**, 2 (1978), 327-380. [Reprinted in the volume dedicated to H. Lewy, Pisa, 1979.]

33. Global uniqueness in the disc lifting problem (with G. Taiani), **J. Diff. Geom.**, **15** (1980), 217-223.

34. Real analytic approximation of locally embeddable CR manifolds (with G. Taiani), **Compositio Math.**, **44** (1981), 113-131. [Volume dedicated to A. Andreotti.]

35. On the H. Lewy extension phenomenon in higher codimension (with G. Taiani), **Proc. AMS**, **91**, 4 (1984), 568-572.

36. What is the notion of a complex manifold with a smooth boundary?, **Algebraic Analysis, Vol. 1** (Kashiwara and Kawai, ed.) Academic Press (1988), 185-201. [Volumes dedicated to M. Sato.]

37. The inverse problem of electroencephalography using an imaging technique for

simulating cortical surface data (with R. B. Kearfott and R. D. Sidman), **Proc. 12th IMACS world Congress** (R. Vichnevetsky, P. Borne and J. Vignes, ed.), 3 (1988), 735-738.

38. Development and application of mathematical techniques for the non invasive localization of the sources of scalp-recorded electric potentials (with R. D. Sidman, et. al.), **Biomedical Systems Modelling and Simulation, Vol. 5 IMACS Trans. Scientific Computing** (J. Eisenfeld and D. S. Levine, ed.), J. C. Baltzer AG, Basel (1988), 133-157

39. A family of exotic structures on $S^2 \times S^3$, in **Analyse Complexe Multi variable: Récents Développements** (A. Ménil, ed.), **Guadalupe** (1988), **Edit El, Commenda di Rende** (1991), 105-110.

40. The super complex Frobenius theorem (with S. R. Simanca), **Annales Polonici Math.** 55 (1991), 139-155.

41. Numerical tests of a method for simulating electrical potentials on the cortical surface (with R. B. Kearfott, R. D. Sidman, D. J. Major), **IEEE Trans. Biomedical Eng.**, 38, 3 (1991), 294-299.

42. Effective computation of the symmetric lens (with P. Susskind, V. Giambalvo), in **Applied and Industrial Mathematics: Venice I** (R. Spigler, ed.), **Kluwer, Dordrecht** (1991), 351-357.

43. The Maxwell condition in Friedmann cosmology, in **The Math. Heritage of C. F. Gauss** (G. M. Rassias, ed.), **World Scientific, Singapore** (1991), 349-357.

44. Counterexamples to Newlander-Nirenberg up to the boundary, **Proc. Symp. Pure Math. (SCV)**, 52, **AMS**, Providence, R.I. (1991), 191-197.

45. The CIT scan (with R. D. Sidman), in **Wave Propagation and Inversion** (W. E. Fitzgibbon, M. F. Wheeler, ed.), **SIAM** (1992), 34-45.

46. An analytic disc approach to the notion of type of points (with R. Dwilewicz), **Indiana Math. J.**, 41 (1992), 713-739.

47. Newlander-Nirenberg theorem on supermanifolds with boundary (with S. R. Simanca), **Riv. Mat. Univ. Parma**, (5) 2 (1993), 213-228.

48. A characterization of harmonic functions and points of finite and infinite type (with R. Dwilewicz), **Indag. Mathem.**, 4 (1993), 39-50.

49. A collar neighborhood theorem for a complex manifold (with M. Nacinovich), **prépublication de l'Institut Fourier Grenoble**, n.197 (1992); **Rend. Sem. Mat. Univ. Padova**, 91 (1994), 23-30.

50. A necessary condition for global Stein immersion of compact CR manifolds (with M. Nacinovich), **prépublication de l'Institut Fourier Grenoble**, n.198 (1992); **Riv. Mat. Univ. Parma**, (5) 1 (1992), 175-182.

51. *Embeddable CR manifolds with nonembeddable smooth boundary (with M. Nacinovich)*, **prépublication de l'Institut Fourier Grenoble**, n.199 (1992); **Boll. U.M.I.**, 7 (1993), 387-395.
52. *The topology of Stein CR manifolds and the Lefschetz theorem (with M. Nacinovich)*, **Ann. Inst. Fourier Grenoble**, 43 (1993), 459-468.
53. *The Jacobian theorem for mapping of pseudoconcave CR hypersurfaces (with M. Nacinovich)*, **preprint**, Dipartimento di matematica, Pisa 1.90, 767 (Oct 1993); **Boll. U.M.I.**, 7 (1995), 149-155.
54. *Pseudoconcave CR manifolds (with M. Nacinovich)*, **preprint**, Dipartimento di matematica, Pisa 1.76, 723 (Feb 1993); in *Complex Analysis and Geometry (V. Ancona, E. Ballico, A. Silva, ed.)*, **Lecture notes in pure and applied mathematics vol. 173**, Marcel Decker, New York (1996), 275-297.
55. *Aneurysms of Pseudoconcave CR manifolds (with M. Nacinovich)*, **preprint**, Dipartimento di matematica, Pisa 1.83, 745 (June 1993); **Math. Zeitschrift** 220 (1995), 347-367.
56. *Duality and distribution cohomology of CR manifolds (with M. Nacinovich)*, **preprint**, Dipartimento di matematica, Pisa 1.93, 787 (Feb 1994); **Ann. Scuola Norm. Sup. Pisa**, 22, 2 (1995), 315-339.
57. *On the Cauchy problem in complex analysis (with M. Nacinovich)*, **preprint**, Dipartimento di matematica, Pisa 1.103, 821 (Oct 1994); **Ann. Mat. Pura Appl. CLXXI** (1996), 159-179.
58. *Simplicially q -pseudoconcave CR manifolds and wedge decomposition (with M. Nacinovich)*, **preprint**, Dipartimento di matematica, Pisa 1.113, 845 (Feb. 1995); **Sem. di Geom. Bologna 1996-1997**, 111-124.
59. *Spinning analytic discs and domains of dependence (with R. Dwilewicz)*, **Manuscripta math.** 97 (1998), 407-427.
60. *Solvable Lie algebras and the embedding of CR manifolds (with M. Nacinovich)*, **Boll. U.M.I.** 8, 2-B (1999), 121-126.
61. *Leray residues and Abel's theorem in CR codimension k (with M. Nacinovich)*, **Ann. Mat. Pura Appl. CLXXVI** (1999), 287-322.
62. *Conormal suspensions of differential complexes (with M. Nacinovich)*, **preprint**, Dipartimento di matematica, Pisa 1.179.1041 (June 1977); **J. Geom. Anal.** 10, 3 (2000), 496-537.
63. *A weak pseudoconcavity condition for abstract almost CR manifolds (with M. Nacinovich)*, **Inventiones Math.** 142 (2000), 251-283.
64. *Two lemmas on double complexes and their applications to CR cohomology (with M. Nacinovich)*, in **Selected topics in Cauchy-Riemann geometry (ed. S. Dragomir)**,

quaderni di matematica vol 9, Aracne, Caserta (2001), 125-138.

65. Pseudoconvexity at infinity (with M. Nacinovich), **preprint**, Dipartimento di matematica, Pisa 1,229.1228 (Feb. 2000), in **Selected topics in Cauchy-Riemann geometry** (ed. S. Dragomir), *quaderni di matematica vol 9*, Aracne, Caserta (2001), 139-173.

66. The conormal type function for CR manifolds (with R. Dwilewicz), **Publ. Math. Debrecen** (2002), 245-282.

67. Obstructions to generic embeddings (with J. Brinkschulte and M. Nacinovich), **Ann. Inst. Fourier** 52,6, Grenoble (2002), 1785-1792.

68. On the failure of the Poincare lemma for the ∂_M complex (with M. Nacinovich), **Math. Ann.** 324,6 (2002), 213-224.

69. The Poincare lemma and local embeddability (with J. Brinkschulte and M. Nacinovich), **Boll. U.M.I.** 8,6-B (2003), 393-398.

70. Remarks on weakly pseudoconvex boundaries (with J. Brinkschulte and M. Nacinovich), **Indag. Mathem. N.S.**, 14 (1) (2003), 1-10.

71. Weak pseudoconcavity and the maximum modulus principle (with M. Nacinovich), **Ann. Mat. Pura Appl.** 182 (2003), 103-112.

72. Integrability of rough almost complex structures (with M. Taylor), **J. Geom. Anal.** 12, 1 (2003), 163-172.

73. Fields of CR meromorphic functions (with M. Nacinovich), **Rend. Sem. Mat. Univ. Padova**, 111 (2004), 179-204.

74. The H-principle and pseudoconcave CR manifolds (with E. Porten), **Contemp. Math.** 389 (2005), 117-123. [Proceed. Albertofest, Cuernavaca, 2004]

75. Stein fillability and the realization of contact manifolds (with M. Nacinovich), **Proceed. AMS** 133, 6 (2005), 1843-1850.

76. Holomorphic correspondences between CR manifolds (with R. Shafikov), **Indiana Univ. Math. J.** 54, 2 (2005), 417-441.

77. Elementary pseudoconcavity and fields of CR meromorphic functions (with M. Nacinovich), **Rend. Sem. Mat. Univ. Padova** 113 (2005), 99-115.

78. On the failure of the Poincare lemma for the ∂_M complex II (with M. Nacinovich), **Math. Ann.** 335, 1 (2006), 193-219.

79. The complex Frobenius theorem for rough involutive structures (with M. Taylor), **Trans. AMS** 359, 1 (2007), 293-322.

80. Remarks on weakly pseudoconvex boundaries: Erratum (with J. Brinkshulte and M. Nacinovich), **Indag. Mathem. N.S.** 18, 1 (2007), 1-2.

81. *Twisting rays imply conformally periodic universes (with P. Nurowski)*, **Class. Q. Grav.** **25**, 3 (2008), 035014 (5pp) doi:10.1088/0264-9381/25/3/035014.
82. *On the Cauchy problem for the ∂ operator*, **Arkiv foer Mat.** **46** (2008), 1-11 (with J. Brinkschulte).
83. *Einstein's equations and the embedding of 3-dimensional CR manifolds (with J. Lewandowski and P. Nurowski)*, **Ind. Univ. Math. J.** **57**, 7 (2008), 3131-3176, math.DG, arXiv: 0709.3660.
84. *Intrinsic geometry of oriented congruences in three dimensions (with P. Nurowski)*, **J. Geom. Phys.** **59**, (2009), 133-172, doi:10.1016/j.geomphys.2008.10.001
85. *Malgrange's vanishing theorem for weakly pseudoconcave CR manifolds*, **Manuscripta Math** **131** (2010) no 3-4, 503-506 (with J. Brinkschulte, M. Nacinovich)
86. *Differential equations and para-CR structures*, **Boll. Unione Mat. Ital. (9) 3** (2010), 25-91 (coauthor P. Nurowski).
87. *Complex vector fields and hypoelliptic partial differential operators*, **Ann. Inst. Fourier** **60 no3** (2010), 987-1034 (with A. Altomani, M. Nacinovich, E. Porten).
88. *Holomorphic extension from weakly pseudoconcave CR manifolds*, **Rend. Semin. Mat. Univ. Padova** **123** (2010), 69-90 (with M. Nacinovich, E. Porten).
89. *Sharp version of the Goldberg-Sachs theorem*, **Ann. Mat. Pura Appl. (4)** **190** (2011), 295-340 (with R. Gover, P. Nurowski).
90. *Aldo Andreotti*, **Boll. Unione Mat. Ital. (9) 4 no 2** (2011), 295-299.
91. *Complex vector fields, unique continuation and the maximum modulus principle*, **Ann. Mat. Pura Appl. (4)** **191** (2012), 761-769 (with M. Nacinovich).
92. *Non completely solvable systems of complex first order PDE's*, **Rend. Semin. Mat. Univ. Padova** **129** (2013), 129-169 (with M. Nacinovich).
93. *Paul Roesel Garabedian (1927-2010)*, **Notices Amer. Math. Soc.** **61 no 3** (2014), 244-255 (with J. Kazdan, P. Lax, A. Novikoff, A. Jameson, E. Swenson, R. Bers, C. and E. Garabedian).
94. *Obstructions to finite dimensional cohomology of abstract Cauchy-Riemann complexes*, **Ann. Sc. Norm. Sup. Pisa XV** (2016), 343-354 (with J. Brinkschulte).
95. *On the nonvanishing of abstract Cauchy-Riemann cohomology groups*, **Math. Ann.**

363 (2016), 1-15 (with J. Brinkschulte, M. Nacinovich).

96. Inflexible CR submanifolds, **Math. Zeit.** (2016), doi:10.1007/s00209-016-1831-6. (with J. Brinkschulte).

97. Non locally trivializable CR line bundles over compact Lorentzian CR manifolds, to appear in **Ann. Inst. Fourier**, pages 1-9 (with J. Brinkschulte).

98. How the green light was given for gravitational wave search, **Notices of AMS** (2017) to appear in August Issue (with P. Nurowski).