

CURRICULUM VITAE

Jeff Cheeger

Date of Birth:

December 1, 1943, Brooklyn, New York

Degrees:

B.A., Harvard College, 1964

M.S., Princeton University, 1966

Ph.D., Princeton University, 1967

Employment:

Princeton University,

Teaching and Research Assistant, 1966–1967

University of California, Berkeley,

N.S.F. Postdoctoral Fellow and Instructor, 1967–1968

University of Michigan,

Assistant Professor, 1968–1969

SUNY at Stony Brook,

Associate Professor, 1969–1971

Professor, 1971–1985

Leading Professor, 1985–1992

Distinguished Professor 1990–1992

Courant Institute of Mathematical Sciences, NYU

Professor, 1989–

Silver Professor, 2003–

Visiting Positions:

IMPA, Rio de Janeiro, Brazil, Spring, 1971

Institute for Advanced Study, Fall, 1972, Fall, 1977, Spring, 1978, Fall 1995

Harvard University, Spring, 1972

Institut des Hautes Études Scientifiques, 1984–1985

Mathematical Sciences Research Institute, Spring 1985

Fellowships:

NSF Summer Support 1969–

NSF Postdoctoral Fellow, 1967–1968

Sloan Fellow, 1971–1973

Guggenheim Fellow, 1984–85

Principle Investigator, CIMS Visiting Members NSF Grant, 1995–

Honors:

Invited address, International Congress of Mathematicians, 1974, 1986

Max Planck Research Prize, Alexander von Humboldt Society, 1991

National Academy of Sciences, elected 1997

Finnish Academy of Science and Letters, foreign member, elected 1998

Oswald Veblen Prize in Geometry, American Mathematical Society, 2001

Selected Invited Addresses:

Arbeitstagung, 1972

Annual Meeting of American Mathematical Society, 1978

Geometry Festival, 1990, 1998

Endowed Lectures:

Marston Morse Lecturer, Institute for Advanced Study, 1992

Blyth Lecturer, University of Toronto, 1997

Andrejewski Lecturer, University of Göttingen, 1997

Rado Lecturer, Ohio State University, 1998

Roever Lecturer, Washington University, 1999

Yamabe Lecturer, University of Minnesota, 2000

DeLong Lecturer, University of Colorado, 2001

Fermi Lecturer, Scuola Normale Superiore, Pisa, 2001

Landau Lecturer, Hebrew University of Jerusalem, 2004

Lecture Series:

CIME Summer School, Montecatini Terme (8 lectures on “Critical points”) 1990

Helsinki University, (10 Lectures on “Ricci Curvature”) 1995

Conferences Co-organized:

AMS Conference on Geometric Analysis of Singularities, Boulder, Colorado, 1983
AMS Conference on Geometric Invariants of Elliptic Operators, Bowdin, Maine, 1988
Geometry Festival, SUNY Stony Brook, 1989
AMS Special Session on Ricci Curvature Philadelphia, Pennsylvania, 1991
Geometry Festival, Courant Institute, 1992, 2001
JDG Conference on Geometry and Topology, 1996
Conference on Geometric Analysis, San Feliu do Guixols 1997
Conference on Connections in Mathematics and Physics, Stony Brook 1998
Geometry Festival, SUNY Stony Brook, 1998

AMS Committees:

Committee to select speakers for AMS Eastern Meetings, 1977–78.
Committee on Translations 1977–1978.
Committee to select the winner of the Veblen Prize for 1996, 1994–1995

NSF Panels:

Panel to select NSF Postdoctoral Fellows, 1987–1989.
Panel to select winner of the Alan T. Waterman Award, 2001—

Editorships:

Assoc. Editor, Proceedings of the American Mathematical Society 1980–83
Assoc. Editor, Journal of Differential Geometry, 1988–1993
Editor, Journal of Geometric and Functional Analysis 1990–2000
Editorial Board, Journal of Geometric and Functional Analysis 2000—
Editor, Journal of Differential Geometry, 1994–8
Editorial Board, Communications on Pure and Applied Mathematics, 1997–

Postdoctoral Researchers Supervised:

Regina Rotman, 1998–99
Chadwick Sprouse, 1999–2000
Hao Fang, 2001–2004

Doctoral Theses Supervised:

Douglas Elerath, 1976

Ping Charng Lue, 1978

Arthur Chou, 1982

Aparna Dar, 1985

Scott Hensley, 1985

DaGang Yang, 1987

Xianzhe Dai, 1989

Xiaochun Rong, 1990

Shunhui Zhu, 1990

Zhong-dong Liu, 1991

Christina Sormani, 1996

Alireza Ranjbar-Motlagh, 1998

Yu Ding, 2001

PUBLICATIONS

1. The relation between the diameter and the smallest eigenvalue of the Laplacian for manifolds of nonnegative curvature, *Archiv. der Mathematik* (1968) 558–560.
2. The structure of complete manifolds of nonnegative curvature (with D. Gromoll) *Bull. Amer. Math. Soc.* (1968) 1147–1150.
3. Pinching theorems for a certain class of Riemannian manifolds, *Amer. J. Math.*, XCI, No. 3 (July 1969) 807–834.
4. Infinitesimal isometries and Pontrjagin numbers (with P. Baum) *Topology* (1969) 173–193.
5. A lower bound for the smallest eigenvalue of the Laplacian, *Proc. of Princeton Conf. in Honor of Prof. S. Bochner* (1969) 195–199.
6. A combinatorial formula for Stiefel-Whitney classes, *Proc. of Georgia Topology Conference* (1969) 470–471.
7. Counting topological manifolds, (with J. Kister) *Proc. of Georgia Topology Conference* (1969).
8. Compact manifolds of nonnegative curvature, *Proc. of Oberwolfach Conference on Differential Geometry* (1969) 25–41.
9. Finiteness theorems for Riemannian manifolds, *Amer. J. Math.* XCII, No. 1 (1970) 61–74.
10. Homeomorphism types of topological manifolds (with J. Kister) *Topology* 9, (1970) 149–151.
11. The splitting theorem for manifolds of nonnegative Ricci curvature (with D. Gromoll) *J. Diff. Geom.* 6, No. 1 (1971) 119–128.
12. On the structure of complete manifolds of nonnegative curvature (with D. Gromoll) *Ann. of Math.* 96, No. 3. (1972) 413–443.
13. Multiplication of differential characters, *Proc. of Rome Conference on Geometry* (1972) 441–445.
14. Some examples of manifolds of nonnegative curvature, *J. Diff.* 8, No. 4 (1973) 623–628.
15. Invariants of flat bundles, *Proc. of International Congress of Mathematicians, Vancouver* (1974) 3–6.
16. Comparison theorems in Riemannian geometry, (book with D. Ebin) *North Holland* (1975).
17. Analytic torsion and Reidemeister torsion, *Proc. Nat. Acad. Sci.* 74, No. 7 (1977) 2651–2654.
18. Spectral geometry of spaces with cone-like singularities, (longer original version of

19. On the spectral geometry of spaces with cone-like singularities, Proc. Nat. Acad. Sci. 76 (1979) 2103–2106.
20. Analytic torsion and the heat equation, Ann. of Math., 109, (1979) 259–322.
21. On the lower bound for the injectivity radius of $1/4$ -pinched Riemannian manifolds (with D. Gromoll), (revised version of 1972 preprint) J. Diff. Geom. 15 (1980) 437–442.
22. On the Hodge Theory of Riemannian pseudomanifolds, Amer. Math. Soc. Proc. Sym. Pur. Math. XXXVI (1980) 91–146.
23. A lower bound for the heat kernel (with S.T. Yau) Com. Pur. Appl. Math. XXXIV (1981) 465–480.
24. Lattice gravity of Riemannian geometry of piecewise linear space (with W. Muller and R. Schrader) Proc Heisenberg Symp., Munich (1981).
25. On the diffraction of waves by conical singularities I (with M. Taylor) Com. Pur. App. Math. XXV (1982) 275–331.
26. On the diffraction of waves by canonical singularities II (with M. Taylor) Com. Pur. App. Math. XXXV (1982) 487–529.
27. L_2 -cohomology and intersection homology of algebraic varieties (with R. MacPherson and M. Goresky) Sem. Diff. Geom., S.T. Yau Ed. (Ann. Math. Study 102) Princeton Univ. Press (1982) 303–340.
28. Finite propagation speed, kernel estimates for functions of the Laplace operator, and the asymptotic geometry of complete Riemannian manifolds (with M. Gromov and M. Taylor) J. Diff. Geom. 17 (1982) 15–53.
29. Spectral geometry of singular Riemannian spaces, J. Diff. Geom. 18 (1983) 575–657.
30. Hodge theory of complex cones, Analyse et topologie sur les espaces singuliers, (II-III) Asterisque 101–102 (1983) 118–133.
31. On the curvature of piecewise flat spaces (with W. Muller and R. Schrader) Commun. Math. Phys. 92 (1984) 405–445.
32. Bounds on the Von Neumann dimension of L^2 -cohomology and the Gauss Bonnet Theorem for open manifolds (with M. Gromov) J. Diff. Geom. 20 (1984) 1–34.
33. Differential characters and geometric invariants (with J. Simons) mimeographed, Lecture Notes distributed at Amer. Math. Soc. Conference on Differential Geometry, Stanford (1973) and published in Geometry and Topology, Lecture Notes in Math. 1167, Springer-Verlag (1985).
34. Characteristic numbers of complete manifolds of bounded curvature and finite volume (with M. Gromov), (H.E. Rauch Memorial Volume I. Chavel and H. Farkas Eds.) Springer-Verlag (1985) 115–154.
35. L_2 -cohomology and group cohomology (with M. Gromov) Topology 24, No. 1.f (1985) 189–215.

36. Collapsing Riemannian manifolds while keeping their curvature bounded (with M. Gromov) I, *J. Diff. Geom.* 23, No. 3 (1986) 309–346.
37. A vanishing theorem for piecewise constant curvature spaces, *Curvature and Topology of Riemannian Manifolds*, K. Shiohama, T. Sakai and T. Sunada Eds. *Lecture Notes in Math.* 1201, Springer-Verlag (1986) 33–40.
38. Kinematic and tube formulas for piecewise linear spaces (with W. Muller and R. Schrader) *Indiana Math. J.* 35, No. 4. (1986) 737–754.
39. On the formulas of Atiyah-Patodi-Singer and Witten, *Proc. International Congress of Mathematicians*, Berkeley (1986).
40. Eta-invariants, the adiabatic approximation and conical singularities *J. Diff. Geom.* 26. (1987) 175–221.
41. Invariants η et indices des familles pour des variétés a bord (with J.-M. Bismut) *C.R. Acad. Sci. Paris t. 305, Série 1.* (1987) 127–130.
42. Eta-invariants and their adiabatic limits (with J.-M. Bismut) *J.A.M.S.* Vol. 2., No. 1. (1989) 33–70.
43. The index theorem for families of Dirac operators on manifolds with boundary; superconnections and cones; I (with J.-M. Bismut) *J. Funct. Anal.* Vol. 89. No. 2 (1990) 313–363.
44. The index theorem for families of Dirac operators on manifolds with boundary; superconnections and cones; II. (with J.-M. Bismut) *J. Funct. Anal.* Vol. 89 No. 3 (1990) 306–353.
45. Collapsing Riemannian manifolds while keeping their curvature bounded, II. (with M. Gromov) *J. Diff. Geom.* Vol. 31, No. 4 (1990) 269–298.
46. Remarks on the index theorem for families of Dirac operators on manifolds with boundary (with J.-M. Bismut) *Pitman Press*, (1990) 59–83.
47. Chopping Riemannian manifolds (with M. Gromov) *Differential Geomtry*, B. Lawson and K. Tenenblatt Eds., *Pitman Press*, (1990) 85–94.
48. Critical points of distance functions and applications to geometry, *Lecture Notes in Math*, Vol. 1504, Springer Verlag, (1990) 1–38.
49. Transgression de la classe d’Euler de $SL(2n, \mathbf{Z})$ –fibrés vectoriels, limites adiabatiques d’invariants η , et valeurs spéciales de fonctions L (with J.-M. Bismut), *C.R. Acad. Sci. Paris.* t. 312 Série 1 (1991) 399–404.
50. Finiteness theorems for manifolds with Ricci curvature and $L^{n/2}$ -norm of curvature bounded (with M. Anderson) *GAF A, Geom. Funct. Anal.*, Vol. 1. No. 3 (1991) 231–252.
51. C^α – compactness for manifolds with Ricci curvature and injectivity radius bounded below (with M. Anderson) *J. Diff. Geom.*, Vol. 34, (1992) 265–281.

52. Nilpotent structures and invariant metrics on collapsed manifolds (with K. Fukaya and M. Gromov), JAMS, Vol. 5, No. 2 (1992) 327–372.
53. Transgressed Euler classes of $SL(2n, \mathbf{Z})$ vector bundles, adiabatic limits of eta invariants and special values of L -functions (with J.-M. Bismut), Ann. Scient. Ec. Norm. Sup. 4^e série. t.25 (1992) 335–391.
54. On the cone structure at infinity of Ricci flat manifolds with Euclidean volume growth and quadratic curvature decay (with Gang Tian) Invent. Math. 118 (1994) 493–571.
55. Almost rigidity of warped products and the structure of spaces with Ricci curvature bounded below (with T.H. Colding) C.R. Acad. Sci. Paris, t.320, Série 1 (1995) 353–357.
56. Collapsed riemannian manifolds with bounded diameter and bounded covering geometry (with X. Rong) GAFA, Geom. Funct. Anal., Vol.5, N.2 (1995) 141–160.
57. Linear growth harmonic functions on complete manifolds with nonnegative Ricci curvature (with T. Colding and W. Minicozzi), GAFA, Geom. Funct. Anal., Vol. 5, No. 6, (1995) 948–954.
58. Existence of polarized F-structures on collapsed manifolds with bounded diameter and curvature (with X. Rong) GAFA, Geom. Funct. Anal., Vol. 5 N. 3 (1996) 411–429.
59. Lower bounds on Ricci curvature and the almost rigidity of warped products (with T.H. Colding) Annals of Math., 143 (1996) 189–237.
60. Constraints on singularities under Ricci curvature bounds (with T. Colding and G. Tian) C.R. Acad. Sci. Paris, t.324, Série 1 (1997) 645–649.
61. On the structure of spaces with Ricci curvature bounded below; I (with T. Colding) J. Diff. Geom. 45 (1997) 406–480.
62. Differentiability of Lipschitz functions on metric measure spaces, GAFA, Geom. Funct. Anal., V. 9, N. 3 (1999) 428–517.
63. On the structure of spaces with Ricci curvature bounded below; II (with T. Colding) J. Diff. Geom. 52 (1999) 13–35.
64. On the structure of spaces with Ricci curvature bounded below; III (with T. Colding) J. Diff. Geom. 52 (1999) 37–74.
65. Splittings and Cr -structures for manifolds with nonpositive sectional curvature (with J. Cao and X. Rong) Invent. Math. (2000).
66. Degeneration of riemannian metrics under Ricci curvature bounds, Lezione Fermiane, Accademia Nazionale dei Lincei, Scuola Normale Superiore, Pisa (2001).
67. On the singularities of spaces with bounded Ricci curvature (with T. Colding and G. Tian), GAFA, Geom. Funct. Anal., V. 12 (2002) 873–914.
68. L_p -bounds curvature, elliptic estimates and rectifiability of singular sets, C.R. Acad. Sci. Paris, t.334, Série 1 (2002) 195–198.

69. Integral bounds on curvature, elliptic estimates and rectifiability of singular sets, *GAF*, *Geom. Funct. Anal.*, V. 13 (2003) 20–72.
70. Degeneration of Einstein metrics and metrics with special holonomy, in *Surveys in Differential Geometry*, vol. 8, *Lectures on Geometry and Topology held in honor of Calabi, Lawson, Siu, and Uhlenbeck at Harvard University, May 3 - 5, 2002*, sponsored by the *J. Diff Geom.*, Ed. S.-T. Yau (2003) 29–73.
71. Local splitting structures on nonpositively curved manifolds and semirigidity in dimension 3, (with J. Cao and X. Rong), *Comm. Anal. Geom.* V.1 N. 1 (2004) 391–417.
72. Anti-self duality of curvature and degeneration of metrics with special holonomy, (with G. Tian), (preprint).
73. Collapsing and noncollapsing of Einstein 4-manifolds, (with G. Tian), (in preparation).