

Zeitschrift: L'Enseignement Mathématique
Herausgeber: Commission Internationale de l'Enseignement Mathématique
Band: 46 (2000)
Heft: 1-2: L'ENSEIGNEMENT MATHÉMATIQUE

Artikel: GEOMETRIC K-THEORY FOR LIE GROUPS AND FOLIATIONS
Autor: BAUM, Paul / CONNES, Alain
Bibliographie
DOI: <https://doi.org/10.5169/seals-64793>

Nutzungsbedingungen

Die ETH-Bibliothek ist die Anbieterin der digitalisierten Zeitschriften auf E-Periodica. Sie besitzt keine Urheberrechte an den Zeitschriften und ist nicht verantwortlich für deren Inhalte. Die Rechte liegen in der Regel bei den Herausgebern beziehungsweise den externen Rechteinhabern. Das Veröffentlichen von Bildern in Print- und Online-Publikationen sowie auf Social Media-Kanälen oder Webseiten ist nur mit vorheriger Genehmigung der Rechteinhaber erlaubt. [Mehr erfahren](#)

Conditions d'utilisation

L'ETH Library est le fournisseur des revues numérisées. Elle ne détient aucun droit d'auteur sur les revues et n'est pas responsable de leur contenu. En règle générale, les droits sont détenus par les éditeurs ou les détenteurs de droits externes. La reproduction d'images dans des publications imprimées ou en ligne ainsi que sur des canaux de médias sociaux ou des sites web n'est autorisée qu'avec l'accord préalable des détenteurs des droits. [En savoir plus](#)

Terms of use

The ETH Library is the provider of the digitised journals. It does not own any copyrights to the journals and is not responsible for their content. The rights usually lie with the publishers or the external rights holders. Publishing images in print and online publications, as well as on social media channels or websites, is only permitted with the prior consent of the rights holders. [Find out more](#)

Download PDF: 19.08.2025

ETH-Bibliothek Zürich, E-Periodica, <https://www.e-periodica.ch>

FURTHER REFERENCES
ON THE BAUM-CONNES CONJECTURE
(compiled and classified by Alain VALETTE)

1) *K-homology*

- ATTIYAH, M. F. Global theory on elliptic operators. *Proc. Int. Symp. on Functional Analysis.* Univ. of Tokyo Press, Tokyo, 1969, 21–30.
- Elliptic operators, discrete groups and von Neumann algebras. *Astérisque* 32-33 (1976), 43–72.
- BAUM, P. and R. G. DOUGLAS. K-theory and index theory. *Proc. Symp. Pure Math.* 38. Part 1 (Operator Algebras and Applications, R. Kadison ed.), Amer. Math. Soc. (1982), 117–173.
- KASPAROV, G. G. Topological invariants of elliptic operators, I: K-homology (English translation). *Math. USSR Izvestija* 9 (1975), 751–792.

2) *Chern characters*

- BAUM, P., J. BLOCK and N. HIGSON. Chern character for totally disconnected groups. Preprint.
- BAUM, P. and A. CONNES. Chern character for discrete groups. *A Fête of Topology.* North Holland, 1987, 163–232.
- BAUM, P., N. HIGSON and R. J. PLYMEN. Equivariant homology for $\mathrm{SL}(2)$ of a p -adic field. *Contemp. Math.* 148 (1993), 1–18.
- HIGSON, N. and V. NISTOR. Cyclic homology of totally disconnected groups acting on buildings. *J. Funct. Anal.* 141 (1996), 466–495.
- SCHNEIDER, P. The cyclic homology of p -adic reductive groups. *J. reine angew. Math.* 475 (1996), 39–54.

3) *Kasparov theory (KK-theory)*

- BAAJ, S. and P. JULG. Théorie bivariante de Kasparov et opérateurs non bornés dans les C^* -modules hilbertiens. *C. R. Acad. Sci. Paris, Sér. I Math.* 296 (1983), 875–878.
- CUNTZ, J. and G. SKANDALIS. Mapping cones and exact sequences in KK-theory. *J. Operator Theory* 15 (1986), 163–180.
- KASPAROV, G. G. The operator K-functor and extensions of C^* -algebras (English translation). *Math. USSR Izvestija* 16 (1981), 513–572.
- An index for invariant elliptic operators, K-theory, and representations of Lie groups (English translation). *Soviet Math. Dokl.* 27 (1983), 105–109.
- Operator K-theory and its applications: elliptic operators, group representations, higher signatures, C^* -extensions. *Proc. ICM*, vol. 2, Warsaw (1983), 987–1000.
- KNUDSEN JENSEN, M. and K. THOMSEN. *Elements of KK-Theory.* Birkhäuser, 1991.

- KUCEROVSKI, D. Kasparov products in KK -theory and unbounded operators with applications to index theory. PhD thesis, Magdalen College, Oxford, 1994.
- PIMSNER, M. KK -groups of crossed products by groups acting on trees. *Invent. Math.* 86 (1986), 603–634.

4) *E-theory*

- CONNES, A. and N. HIGSON. Déformations, morphismes asymptotiques et K -théorie bivariante. *C. R. Acad. Sci. Paris, Sér. I Math.* 311 (1990), 101–106.
- GUENTNER, E., N. HIGSON and J. TROUT. Equivariant theory for C^* -algebras. Preprint, 1997.
- HIGSON, N., G. G. KASPAROV and J. TROUT. A Bott periodicity theorem for infinite-dimensional Euclidian space. *Adv. Math.* 135 (1998), 1–40.

5) *K-amenability*

- CUNTZ, J. K -theoretic amenability for discrete groups. *J. reine angew. Math.* 344 (1983), 180–195.
- FOX, J. and P. HASSELL. K -amenability for $SU(n, 1)$. *J. Funct. Anal.* 117 (1993), 279–307.
- JULG, P. and A. VALETTE. K -theoretic amenability for $\mathrm{SL}_2(\mathbf{Q}_p)$ and the action on the associated tree. *J. Funct. Anal.* 58 (1984), 194–215.
- SKANDALIS, G. Une notion de nucléarité en K -théorie. *K-Theory* 1 (1988), 549–573.

6) *Connes-Kasparov conjecture (connected Lie groups)*

- CONNES, A. An analogue of the Thom isomorphism for crossed products of a C^* -algebra by an action of \mathbf{R} . *Adv. Math.* 39 (1981), 31–55.
- PENINGTON, M. and R. J. PLYMEN. The Dirac operator and the principal series for complex semi-simple Lie groups. *J. Funct. Anal.* 53 (1983), 269–286.
- VALETTE, A. K -theory for reduced C^* -algebra of a semisimple Lie group with rank 1 and finite centre. *Quart. J. Math. Oxford Ser. (2)* 35 (1984), 341–359.
- . Dirac induction for semi-simple Lie groups having one conjugacy class of Cartan subgroups. *Proc. Conf. on Operator algebras, ergodic theory and topology*, Busteni (Roumanie) 1983. Springer Lecture Notes in Math. 1132 (1985), 526–555.
- WASSERMANN, A. Une démonstration de la conjecture de Connes-Kasparov pour les groupes de Lie linéaires connexes réductifs. *C. R. Acad. Sci. Paris, Sér. I Math.* 304 (1987), 559–562.

7) *Baum-Connes conjecture – surjectivity of μ*

- BAUM, P. and A. CONNES. Geometric K -theory for Lie groups and foliations. Preprint, 1982. *L'Enseignement Math.* (2) 46 (2000), 3–42.
- . *K-theory for Discrete Groups in Operator Algebras and Applications*. D. Evans and M. Takesaki eds. Cambridge Univ. Press (1988), 1–20.

- BAUM, P., A. CONNES and N. HIGSON. Classifying space for proper actions and K -theory of group C^* -algebras. In *C^* -Algebras: 1943–1993, a Fifty Year Celebration*, R. S. Doran ed. *Contemp. Math.* 167 (1994), 240–291.
- BAUM, P., N. HIGSON and R. J. PLYMEN. A proof of the Baum-Connes conjecture for p -adic $GL(n)$. *C. R. Acad. Sci. Paris, Sér. I Math.* 325 (1997), 171–176.
- BÉGUIN, C., H. BETTAIEB and A. VALETTE. K -theory for C^* -algebras of one-relator groups. *K-Theory* 16 (1999), 277–298.
- BLOCK, J. Some remarks concerning the Baum-Connes conjecture. *Comm. Pure Appl. Math.* 50 (1997), 813–820.
- CONNES, A. *Noncommutative Geometry*. Academic Press, 1994.
- GROMOV, M. Positive curvatures, macroscopic dimension, spectral gaps, and higher signatures. *Functional Analysis on the Eve of the 21st Century*, Vol. II (New Brunswick, NJ, 1993), *Progr. Math.* 132 (1996), 1–213.
- HIGSON, N. and G.G. KASPAROV. Operator K -theory for groups which act properly and isometrically on Hilbert space. *Electron. Res. Announc. Amer. Math. Soc.* 3 (1997), 131–142.
- JULG, P. Remarks on the Baum-Connes conjecture and Kazhdan’s property (T). *Fields Inst. Commun.* 13 (1997), 145–155.
- Travaux de N. Higson et G. Kasparov sur la conjecture de Baum-Connes. *Séminaire Bourbaki*, Exposé 841 (1998).
- JULG, P. and G.G. KASPAROV. Operator K -theory for the group $SU(n, 1)$. *J. reine angew. Math.* 463 (1995), 99–152.
- KASPAROV, G.G. Lorentz groups: K -theory for unitary representation and crossed products. (English translation). *Soviet Math. Dokl.* 29 (1984), 256–260.
- KESWANI, N. Homotopy invariance of relative eta-invariants and C^* -algebra K -theory. *Electron. Res. Announc. Amer. Math. Soc.* 4 (1998), 18–26.
- LAFFORGUE, V. Une démonstration de la conjecture de Baum-Connes pour les groupes réductifs sur un corps p -adique et pour certains groupes discrets possédant la propriété (T). *C. R. Acad. Sci. Paris, Sér. I Math.* 327 (1998), 439–444.
- Compléments à la démonstration de la conjecture de Baum-Connes pour certains groupes possédant la propriété (T). *C. R. Acad. Sci. Paris, Sér. I Math.* 328 (1999), 203–208.
- OYONO-OYONO, H. La conjecture de Baum-Connes pour les groupes agissant sur les arbres. *C. R. Acad. Sci. Paris, Sér. I Math.* 326 (1998), 799–804.
- Baum-Connes conjecture and extensions. Preprint, September 1999.
- ROSENBERG, J. Group C^* -algebras and topological invariants. *Monographs Stud. Math.* 18, Pitman (1984), 95–115.
- SKANDALIS, G. Progrès récents sur la conjecture de Baum-Connes. Contribution de Vincent Lafforgue. Sém. Bourbaki (1999), Exposé 869.
- TU, J.-L. The Baum-Connes conjecture and discrete group actions on trees. *K-Theory* 17 (1999), 303–318.
- VALETTE, A. The conjecture of idempotents: a survey of the C^* -algebraic approach. *Bull. Soc. Math. Belg. Sér. A* 41 (1989), 485–521.
- Introduction to the Baum-Connes conjecture. Preprint, January 2000, <http://www.math.ethz.ch/~indira/Valette.dvi>.

8) *Injectivity of μ – Novikov conjecture*

- BETTAIEB, H. and A. VALETTE. Sur le groupe K_1 des C^* -algèbres de groupes discrets. *C. R. Acad. Sci. Paris, Sér. I Math.* 322 (1996), 925–928.
- CONNES, A. and H. MOSCOVICI. Cyclic cohomology, the Novikov conjecture and hyperbolic groups. *Topology* 29 (1990), 345–388.
- ELLIOTT, G. and T. NATSUME. A Bott periodicity map for crossed products of C^* -algebras by discrete groups. *K-Theory* 1 (1987), 423–435.
- FERRY, S., A. RANICKI and J. ROSENBERG. A history and survey of the Novikov conjecture. *Novikov Conjectures, Index Theorems and Rigidity*, Vol. 1, S. Ferry, A. Ranicki and J. Rosenberg eds. London Math. Soc. Lecture Note Ser. 226. Cambridge Univ. Press, 1995, 7–66.
- HIGSON, N. Bivariant K -theory and the Novikov conjecture. Preprint, summer 1999.
- HIGSON, N. and J. ROE. On the coarse Baum-Connes conjecture. *Novikov Conjectures, Index Theorems and Rigidity*, Vol. 2. London Math. Soc. Lecture Note Ser. 227 (1995), 227–254.
- Amenable group actions and the Novikov conjecture. Preprint, November 1998.
- HURDER, S. Exotic index theory and the Novikov conjecture. *Novikov Conjectures, Index Theorems and Rigidity*, Vol. 2. London Math. Soc. Lecture Note Ser. 227 (1995), 255–276.
- KASPAROV, G. G. Equivariant KK -theory and the Novikov conjecture. *Invent. Math.* 91 (1988), 147–201.
- K -theory, group C^* -algebras, and higher signatures (Conspectus). *Novikov Conjectures, Index Theorems and Rigidity*, Vol. 1. London Math. Soc. Lecture Note Ser. 226. Cambridge Univ. Press (1995), 101–146.
- KASPAROV, G. G. and G. SKANDALIS. Groups acting on buildings, operator K -theory and the Novikov conjecture. *K-Theory* 4 (1991), 303–337.
- Groupes “boliques” et conjecture de Novikov. *C. R. Acad. Sci. Paris, Sér. I Math.* 319 (1994), 815–820.
- MISHCHENKO, A. S. Infinite-dimensional representations of discrete groups, and higher signatures. *Math. USSR Izvestija* 8 (1974), 85–111.
- NATSUME, T. The Baum-Connes conjecture, the commutator theorem and Rieffel projections. *C. R. Math. Rep. Acad. Sci. Canada* 10 (1988), 13–18.
- OGLE, C. Assembly maps, K -theory and hyperbolic groups. *K-Theory* 6 (1992), 235–265.
- ROE, J. Coarse cohomology and index theory on complete Riemannian manifolds. *Mem. Amer. Math. Soc.* 104 (1993).
- Index theory, coarse geometry and topology of manifolds. *CBMS Regional Conference Series in Math.* 90. Amer. Math. Soc., 1996.
- ROSENBERG, J. C^* -algebras, positive scalar curvature and the Novikov conjecture. *Publ. Math. I.H.E.S.* 58 (1983), 197–212.
- ROSENBERG, J. and S. WEINBERGER. An equivariant Novikov conjecture. *K-Theory* 4 (1990), 29–53.
- WEINBERGER, S. Aspects of the Novikov conjecture. In *Geometric and Topological Invariants of Elliptic Operators. Contemp. Math.* 105 (1990), 281–297.
- YU, G. L. Coarse Baum-Connes conjecture. *K-Theory* 9 (1995), 199–221.
- Baum-Connes conjecture and coarse geometry. *K-Theory* 9 (1995), 223–231.

- Localization algebras and the coarse Baum-Connes conjecture. *K-Theory* 11 (1997), 307–318.
- The coarse Baum-Connes conjecture for spaces which admit a uniform embedding into Hilbert space. Preprint, July 1998.

9) *Groupoids and foliations*

HECTOR, G. Groupoïdes, feuilletages et C^* -algèbres (quelques aspects de la conjecture de Baum-Connes). *Geometric Study of Foliations (Tokyo, 1993)*, 3–34. World Sci. Publishing (1994).

MACHO STADLER, M. La conjecture de Baum-Connes pour un feuilletage sans holonomie de codimension un sur une variété fermée. *Publ. Mat.* 33 (1989), 445–457.

TAKAI, H. Baum-Connes conjectures and their applications. *World Sci. Adv. Ser. Dyn. Syst.* 5 (1987), 89–116.

— A counterexample to strong Baum-Connes conjectures for foliated manifolds. *World Sci. Adv. Ser. Dyn. Syst.* 7 (1989), 149–154.

— On the Baum-Connes conjecture. In *Mappings of Operator Algebras. Progr. Math.* 84, Birkhäuser (1990), 183–197.

TORPE, A.-M. K -theory for the leaf space of foliations by Reeb components. *J. Funct. Anal.* 61 (1985), 15–71.

TU, J.-L. La conjecture de Novikov pour les feuilletages hyperboliques. *K-Theory* 16 (1999), 129–184.

— La conjecture de Baum-Connes pour les feuilletages moyennables. *K-Theory* 17 (1999), 215–264.

Paul Baum

Mathematics Department
Pennsylvania State University
University Park, PA 16802
U. S. A.
e-mail : baum@math.psu.edu

Alain Connes

Collège de France
3, rue d'Ulm
F-75005 Paris
and
Institut des Hautes Études Scientifiques
35, route de Chartres
F-91440 Bures-sur-Yvette
France
e-mail : connes@ihes.fr