

**Markl, Martín**

**Homotopy algebras are homotopy algebras.** (English) Zbl 1067.55011  
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The concept of homotopy invariant algebraic structures for topological spaces formulated by *J. M. Boardman* and *R. M. Vogt* [Homotopy invariant algebraic structures on topological spaces, Lecture Notes in Mathematics 347. Berlin-Heidelberg-New York: Springer-Verlag, X, 257 p. DM 22.00; \$ 09.10 (1973; [Zbl 0285.55012](#))] is transferred to the algebra of chain complexes. It is shown that a certain concept of strongly homotopy algebra which is broad enough to include both classical examples such a strongly homotopy associative algebras, strongly homotopy associative commutative algebras and more recent concepts arising in quantum field theory is homotopy invariant.

Reviewer: [K. H. Kamps \(Hagen\)](#)

**MSC:**

[55U35](#) Abstract and axiomatic homotopy theory in algebraic topology  
[55U15](#) Chain complexes in algebraic topology  
[18G55](#) Nonabelian homotopical algebra (MSC2010)

Cited in **37** Documents

**Keywords:**

[homotopy algebra](#); [homotopy invariance](#); [chain complexes](#); [operads](#)

**Full Text:** [DOI](#) [arXiv](#)

**References:**

- [1] Baez J. C., Adv. in Math. 135 pp 145– (1998)
- [2] Berger C. and Moerdijk I.: Axiomatic homotopy theory for operads. Preprint math.AT/ 0206094, June 2002 · [Zbl 1041.18011](#)
- [3] Boardman J. M. and Vogt R. M.: Homotopy Invariant Algebraic Structures on Topological Spaces. Springer-Verlag, 1973 · [Zbl 0285.55012](#)
- [4] Clark A., Pacific J. Math. 15 pp 65– (1965)
- [5] Getzler E. and Jones J. D. S.: Operads, homotopy algebra, and iterated integrals for double loop spaces. Preprint hep-th/9403055, March 1994
- [6] Ginzburg V., Duke Math. J. 76 pp 203– (1994)
- [7] Gugenheim V. K. A. M., Bull. Soc. Math. Belgique 38 pp 237– (1986)
- [8] Halperin S.: Lectures on Minimal Models. Volume 261 of Memoirs Soc. Math. France, Nouv. Ser. 9-10. Soc. Math. France, 1983
- [9] Hess K.: Perturbation and transfer of generic algebraic structures. In: Higher Homotopy Structures in Topology and Mathematical Physics (ed. by J. McCleary). Volume 227 of Contemp. Mathematics, pages 103-143. American Mathematical Society, 1999 · [Zbl 0936.16026](#)
- [10] Hilton P. J. and Stammach U.: A Course in Homological Algebra. Volume 4 of Graduate Texts in Mathematics. Springer-Verlag, 1971 · [Zbl 0238.18006](#)
- [11] Hinich V., Comm. Algebra 25 pp 3291– (1997)
- [12] Hinich V.: Tamarkin’s proof of Kontsevich formality theorem. Preprint math.QA/ 0003052, March 2000 · [Zbl 1081.16014](#)
- [13] Huebschmann J., Math. Z. 207 pp 245– (1991)
- [14] Johansson L. and Lambe L.: Transferring algebra structures up to homology equivalence. To appear in Math. Scand. November 1996 · [Zbl 1023.16010](#)
- [15] Kadeishvili T. V., Trudy Tbiliss. Mat. Inst. Razmadze Akad. Nauk Gruzin. SSR 77 pp 50– (1985)
- [16] Kontsevich M.: Operads and motives in deformation quantization. Preprint math.QA/ 9904055, April 1999 · [Zbl 0945.18008](#)
- [17] Lada T.: Strong homotopy algebras over monads. In: The Homology of Iterated Loop Spaces (ed. by F. R. Cohen, T. Lada, and P. May). Volume 533 of Lecture Notes in Mathematics, pages 399-479. Springer, 1976
- [18] Lada T., Comm. Algebra 23 pp 2147– (1995)
- [19] Lada T., Internat. J. Theoret. Phys. 32 pp 1087– (1993)

- [20] Lambe L., *Manuscripta Math.* 58 pp 363– (1987)
- [21] Mac Lane S., *Rice Univ. Stud.* 49 pp 28– (1963)
- [22] Markl M., *J. Pure Appl. Algebra* 83 pp 141– (1992)
- [23] Markl M., *Comm. Algebra* 24 pp 1471– (1996)
- [24] Markl M.: Homotopy algebras via resolutions of operads. In: Proceedings of the 19th Winter School “Geometry and physics”, Srní?, Czech Republic. January 9–15, 1999. Volume 63 of *Supplem. ai Rend. Circ. Matem. Palermo, Ser. II*, pages 157–164, 2000
- [25] Markl M.: Homotopy diagrams of algebras. Preprint math.AT/0103052. To appear in the Proceedings of the Winter School “Geometry and Physics”, March 2001
- [26] Markl M., *Comm. Algebra* 29 pp 5209– (2001)
- [27] Markl M., Shnider S., and Stashe J. D.: *Operads in Algebra, Topology and Physics*. Volume 96 of *Mathematical Surveys and Monographs*. American Mathematical Society, Providence, Rhode Island, 2002
- [28] Stashe J. D., *Trans. Amer. Math. Soc.* 108 pp 275– (1963)
- [29] Sugawara M., *Ser. A Math.* 33 pp 257–
- [30] Sullivan D.: Infinitesimal computations in topology. *Publ. Math. Inst. Hautes Etudes Sci.* 47 (1977), 269–331 · [Zbl 0374.57002](#)
- [31] Vogt R. M., Preprint E 99 pp 81–
- [32] Voronov A. A.: Homotopy Gerstenhaber algebras. Preprint math.QA/9908040, August 1999 · [Zbl 0974.16005](#)

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