

**Berglund, Per; Candelas, Philip; de la Ossa, Xenia; Font, Anamaria; Hübsch, Tristan; Jančić, Dubravka; Quevedo, Fernando**

**Periods for Calabi-Yau and Landau-Ginzburg vacua.** (English) Zbl 0896.14022

Nucl. Phys., B 419, No. 2, 352-403 (1994).

Summary: The complete structure of the moduli space of Calabi-Yau manifolds and the associated Landau-Ginzburg theories, and hence also of the corresponding low-energy effective theory that results from (2, 2) superstring compactification, may be determined in terms of certain holomorphic functions called periods. These periods are shown to be readily calculable many of such models. We illustrate this by computing the periods explicitly for a number of classes of Calabi-Yau manifolds. We also point out that it is possible to read off from the periods certain important information related to the mirror manifolds.

**MSC:**

- 14J32 Calabi-Yau manifolds (algebraic-geometric aspects)
- 32G20 Period matrices, variation of Hodge structure; degenerations
- 81T30 String and superstring theories; other extended objects (e.g., branes) in quantum field theory
- 53Z05 Applications of differential geometry to physics

Cited in **1** Review  
Cited in **5** Documents

**Keywords:**

moduli space of Calabi-Yau manifolds; Landau-Ginzburg theories; superstring compactification; periods; mirror manifolds

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

**References:**

- [1] Strominger, A.: Commun. math. Phys.. 133, 163 (1990)
- [2] Candelas, P.; De La Ossa, X. C.: Nucl. phys.. 355, 455 (1991)
- [3] Candelas, P.; De La Ossa, X.; Green, P.; Parkes, L.: Nucl. phys.. 359, 21 (1991)
- [4] Morrison, D.: Picard-Fuchs equations and mirror maps for hypersurfaces. Essays on mirror symmetry (1992) · [Zbl 0841.32013](#)
- [5] Font, A.: Nucl. phys.. 391, 358 (1993)
- [6] Klemm, A.; Theisen, S.: Nucl. phys.. 389, 153 (1993)
- [7] P. Candelas, X. de la Ossa, A. Font, S. Katz and D. Morrison, in preparation
- [8] Kreuzer, M.; Skarke, H.: Nucl. phys.. 388, 113 (1992)
- [9] Kreuzer, M.; Skarke, H.: Commun. math. Phys.. 150, 137 (1992)
- [10] A. Klemm and R. Schimmrigk, Landau-Ginzburg vacua, CERN preprint CERN-TH-6459/92, Universität Heidelberg report HD-THEP-92-13
- [11] Berglund, P.; Hübsch, T.: S-t.yau essays on mirror manifolds. Essays on mirror manifolds, 388 (1992)
- [12] B.R. Greene and M.R. Plesser, Mirror manifolds, a brief review and progress report, Cornell and Yale University preprints CLNS 91-1109, YCTP-P32-91
- [13] Hübsch, T.: Commun. math. Phys.. 108, 291 (1987)
- [14] Green, P.; Hübsch, T.: Commun. math. Phys.. 109, 99 (1987)
- [15] Candelas, P.; Dale, A. M.; Lütken, C. A.; Schimmrigk, R.: Nucl. phys.. 298, 493 (1988)
- [16] Hübsch, T.: Calabi-Yau manifolds - A bestiary for physicists. (1992) · [Zbl 0771.53002](#)
- [17] Yau, S. -T.: W.a.bardeena.r.white proc. Symp. on anomalies, geometry, topology. Proc. symp. On anomalies, geometry, topology, 395 (1985)
- [18] Greene, B. R.; Vafa, C.; Warner, N. P.: Nucl. phys.. 324, 371 (1989)
- [19] Hübsch, T.: Class. quant. Grav.. 8, L31 (1991)
- [20] Berglund, P.; Greene, B. R.; Hübsch, T.: Mod. phys. Lett.. 7, 1885 (1992)
- [21] Libgober, A.; Teitelbaum, J.: Lines on Calabi-Yau complete intersections, mirror symmetry and Picard-Fuchs equations. University of illinois report (1992) · [Zbl 0789.14005](#)
- [22] Baryrev, V.: Duke math. J.. 69, 349 (1993)

- [23] Schimmrigk, R.: Phys. Lett.. 193, 175 (1987)
- [24] V. Batyrev and D. Van Straten, Generalized hypergeometric functions and rational curves on Calabi-Yau complete intersections in toric varieties, Universität Essen report, in preparation · [Zbl 0843.14016](#)
- [25] Hübsch, T.; Yau, S. -T.: Mod. Phys. Lett.. 7, 3277 (1992)
- [26] Green, P.; Hübsch, T.: Commun. Math. Phys.. 113, 505 (1987)
- [27] Berglund, P.; Hübsch, T.: Nucl. Phys.. 311, 223 (1994)
- [28] Lynker, M.; Schimmrigk, R.: Phys. Lett.. 249, 237 (1990)
- [29] Greene, B. R.; Plesser, R.: S.-t.yau essays on mirror symmetry. Essays on mirror symmetry, 1 (1992) · [Zbl 0826.32023](#)
- [30] Atiyah, M.; Bott, R.; Gårding, L.: Acta Math.. 131, 145 (1973)
- [31] Candelas, P.: Nucl. Phys.. 298, 458 (1988)
- [32] Erdélyi, A.; Oberhettinger, F.; Magnus, W.; Tricombi, F. G.: Higher transcendental functions. 1-3 (1953) · [Zbl 0051.30303](#)
- [33] P. Berglund and S. Katz, in preparation
- [34] Luke, Y. L.: The special functions and their approximations. 1 and 2 (1969) · [Zbl 0193.01701](#)
- [35] A. Klemm and Theisen, Mirror maps and instanton sums for complete intersections in weighted projective space, Munich University preprint LMU-TPW-93-08
- [36] S. Katz, private communication
- [37] Cadavid, A. C.; Ferrara, S.: Phys. Lett.. 267, 193 (1991)
- [38] Blok, B.; Varchenko, A.: Int. J. Mod. Phys.. 7, 1467 (1992)
- [39] Lerche, W.; Smit, D. J.; Warner, N. P.: Nucl. Phys.. 372, 87 (1992)
- [40] Ceresole, A.; D'auria, R.; Ferrara, S.; Lerche, W.; Louis, J.: Int. J. Mod. Phys.. 8, 79 (1993)
- [41] Griffiths, P.: Ann. Math.. 90, 460 (1969)
- [42] P. Candelas, X.C. de la Ossa and S. Katz, work in progress
- [43] R. Schimmrigk, Critical superstring vacua from noncritical manifolds: A novel framework, Universität Heidelberg report HD-THEP-92-29 · [Zbl 1050.81663](#)
- [44] Dixon, L.: Talk presented at the mirror symmetry workshop. (1991)
- [45] M. Bershadsky, S. Cecotti, H. Ooguri and C. Vafa, Holomorphic anomalies in topological field theories, Harvard University preprint HUTP-93/A008 · [Zbl 0908.58074](#)
- [46] Candelas, P.; Derrick, E.; Parkes, L.: Generalized Calabi-Yau manifolds and the mirror of a rigid manifold. Cern-th.6831/93 (1993) · [Zbl 0899.32011](#)
- [47] Greene, B.; Roan, S. -S.; Yau, S. -T.: Commun. Math. Phys.. 142, 245 (1991)

This reference list is based on information provided by the publisher or from digital mathematics libraries. Its items are heuristically matched to zbMATH identifiers and may contain data conversion errors. It attempts to reflect the references listed in the original paper as accurately as possible without claiming the completeness or perfect precision of the matching.