

Zeitschrift: L'Enseignement Mathématique
Herausgeber: Commission Internationale de l'Enseignement Mathématique
Band: 46 (2000)
Heft: 3-4: L'ENSEIGNEMENT MATHÉMATIQUE

Artikel: FINITE GROUP ACTIONS ON THE 7-SPHERE
Autor: Geiges, Hansjörg / THOMAS, Charles B.
Bibliographie
DOI: <https://doi.org/10.5169/seals-64810>

Nutzungsbedingungen

Die ETH-Bibliothek ist die Anbieterin der digitalisierten Zeitschriften. 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. [Siehe Rechtliche Hinweise.](#)

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. [Voir Informations légales.](#)

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. [See Legal notice.](#)

Download PDF: 18.04.2025

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

The last comment in the proof above and our earlier remarks about actions on S^{2^t-1} also imply the following: If π acts freely and topologically on S^{2^t-1} , then π satisfies all pq -conditions. On S^{2^s-1} with $2s \neq 2^t$ there are always free smooth actions by metacyclic groups $D_{p,q}$ violating the pq -conditions.

ACKNOWLEDGEMENT. Part (ii) of the theorem was prompted by a question of Raymond Lickorish.

REFERENCES

- [1] BROWN, K. S. *Cohomology of Groups*. Springer, 1982.
- [2] DAVIS, J. F. and R. J. MILGRAM. A survey of the spherical space form problem. *Mathematical Reports 2*, Part 2. Harwood Academic Publishers, 1985.
- [3] GEIGES, H. and C. B. THOMAS. Contact structures on 7-manifolds. In: *Geometry, Topology, and Dynamics* (F. Lalonde, ed.). CRM Proc. Lecture Notes 15 (1998), 53–67.
- [4] GEIGES, H. and C. B. THOMAS. Almost linear actions by finite groups on S^{2n-1} . In: *Proceedings of the Kirbyfest* (J. Hass and M. Scharlemann, eds.). Geometry & Topology Monographs 2 (1999), 135–156.
- [5] KIRBY, R. Problems in low-dimensional topology. In: *Geometric Topology* (W. H. Kazez, ed.). AMS/IP Stud. Adv. Math. 2, Part 2. Amer. Math. Soc. (1997), 35–473.
- [6] LAITINEN, E. and I. MADSEN. Topological classification of $SL_2(\mathbb{F}_p)$ space forms. In: *Algebraic Topology* (J. L. Dupont and I. H. Madsen, eds.). Lecture Notes in Math. 763 (1979), 1–27.
- [7] MADSEN, I., C. B. THOMAS and C. T. C. WALL. The topological spherical space form problem III: Dimensional bounds and smoothings. *Pacific J. Math.* 106 (1983), 135–143.
- [8] MILNOR, J. Groups which act on S^n without fixed points. *Amer. J. Math.* 79 (1957), 623–630.
- [9] PETRIE, T. Free metacyclic group actions on homotopy spheres. *Ann. of Math.* (2) 94 (1971), 108–124.
- [10] RUBINSTEIN, J. H. An algorithm to recognize the 3-sphere. In: *Proceedings of the International Congress of Mathematicians (Zürich, 1994)*. Birkhäuser, 1995.
- [11] SUZUKI, M. On finite groups with cyclic Sylow subgroups for all odd primes. *Amer. J. Math.* 77 (1955), 657–691.
- [12] THOMAS, C. B. Almost linear actions by $SL_2(p)$ on S^{2n-1} . *Forum Math.* 9 (1997), 751–760.
- [13] THURSTON, W. P. Three-dimensional manifolds, Kleinian groups and hyperbolic geometry. *Bull. Amer. Math. Soc. (N.S.)* 6 (1982), 357–381.
- [14] WALL, C. T. C. *Surgery on Compact Manifolds* (2nd edition, ed. by A. A. Ranicki). Math. Surveys Monogr. 69, Amer. Math. Soc., 1999.

- [15] WOLF, J. A. *Spaces of Constant Curvature*. McGraw-Hill, 1967.
- [16] — A contact structure for odd-dimensional spherical space forms. *Proc. Amer. Math. Soc.* 19 (1968), 196.

(Reçu le 14 août 2000)

Hansjörg Geiges

Mathematisch Instituut
Universiteit Leiden
Postbus 9512
NL-2300 RA Leiden
The Netherlands
e-mail: geiges@math.leidenuniv.nl

Charles B. Thomas

Centre for Mathematical Sciences
University of Cambridge
Wilberforce Road
GB-Cambridge CB3 0WB
United Kingdom
e-mail: C.B.Thomas@dpmms.cam.ac.uk