

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

**Artikel:** ORDERINGS OF MAPPING CLASS GROUPS AFTER THURSTON  
**Autor:** SHORT, Hamish / WIEST, Bert

**Bibliographie**  
**DOI:** <https://doi.org/10.5169/seals-64801>

### **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:** 25.04.2026

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

ACKNOWLEDGEMENTS. We are very grateful to W. P. Thurston for sharing with us his idea for the construction of orderings on  $MCG(S)$ . We also thank the following people for helpful comments: S. Chmutov, D. Cooper, L. Paris, D. Rolfsen, C. Rourke, L. Rudolph, and M. Scharlemann. B.W. was supported by a TMR Marie Curie research training grant from the European Community.

## REFERENCES

- [1] BERGMAN, G. Right orderable groups that are not locally indicable. *Pacific J. Math.* 147 (1991), 243–248.
- [2] BIRMAN, J. *Braids, Links, and Mapping Class Groups*. Annals of Math. Studies, 82. Princeton University Press, Princeton, 1975.
- [3] BOWDITCH, B. A variation on the unique product property. To appear in *J. London Math. Soc.*
- [4] BURNS, R. G. and V. W. D. HALE. A note on group rings of certain torsion-free groups. *Canad. Math. Bull.* 15 (1972), 441–445.
- [5] CASSON, A. and P. BLEILER. *Automorphisms of Surfaces after Nielsen and Thurston*. LMS Student Texts 9. Cambridge University Press, 1988.
- [6] DEHORNOY, P. Braid groups and left distributive operations. *Trans. Amer. Math. Soc.* 345 (1994), 115–150.
- [7] DELZANT, T. Sur l’anneau d’un groupe hyperbolique. *C. R. Acad. Sci. Paris Série I*, 324 (1997), 381–384.
- [8] ELRIFAI, E. and H. MORTON. Algorithms for positive braids. *Quart. J. Math. Oxford Ser. (2)* 45 (1994), 479–497.
- [9] FENN, R., M. T. GREENE, D. ROLFSEN, C. ROURKE and B. WIEST. Ordering the braid groups. *Pacific J. Math.* 191 (1999), 49–74. <http://nyjm.albany.edu:8000/PacJ>
- [10] GHYS, E. Le cercle à l’infini des surfaces à courbure négative. *Proc. Int. Cong. Math., Kyoto* (1990), 501–509.
- [11] ——— Groups acting on the circle. Lecture notes IMCA. Lima, June 1999.
- [12] HOWIE, J. and H. SHORT. The band-sum problem. *J. London Math. Soc. (2)* 31 (1985), 571–576.
- [13] KIM, D. and D. ROLFSEN. Ordering groups of pure braids and hyperplane arrangements. UBC preprint, 1999.
- [14] MESS, G. The Torelli groups for genus 2 and 3 surfaces. *Topology* 31 (1992), 775–790.
- [15] NEUWIRTH, L. *Knot Groups*. Annals of Mathematics Studies 56. Princeton University Press, Princeton, N.J., 1965.
- [16] ——— The status of some problems related to knot groups. In: *Topology Conference (Virginia Polytech. Inst. and State Univ., Blacksburg, Va., 1973)*, 209–230. Lecture Notes in Math., Vol. 375. Springer, Berlin, 1974.
- [17] OTAL, J.-P. *Le théorème d’hyperbolisation pour les variétés fibrées de dimension 3*. Astérisque 235 (1996).
- [18] PASSMAN, D. S. *The Algebraic Structure of Group Rings*. Pure and Applied Mathematics. Wiley-Interscience, 1977.

- [19] RHEMTULLA, A.H. and R. BOTTO MURA. *Orderable Groups*. Lecture Notes in Pure and Applied Mathematics, Vol. 27. Marcel Dekker Inc., New York-Basel, 1977.
- [20] RHEMTULLA, A.H. and D. ROLFSEN. Local indicability in ordered groups: braids and elementary amenable groups. In preparation.
- [21] ROURKE, C. and B. SANDERSON. *Piecewise Linear Topology*. Ergebnisse der Mathematik und ihrer Grenzgebiete 69. Springer, 1972.
- [22] ROURKE, C. and B. WIEST. Order automatic mapping class groups. *Pacific J. Math.* 194 (2000), 209–227.
- [23] SMYTHE, N. Trivial knots with arbitrary projection. *J. Austral. Math. Soc.* 7 (1967), 481–489.
- [24] THURSTON, W. Personal communication.
- [25] WIEST, B. Dehornoy's ordering of the braid groups extends the subword-ordering. *Pacific J. Math.* 191 (1999), 183–188.
- [26] BAUMSLAG, G. On generalised free products. *Math. Z.* 78 (1962), 423–438.
- [27] LONG, D.D. Planar kernels in surface groups. *Quart. J. Math. Oxford Ser. (2)* 35 (1984), 305–310.
- [28] ROLFSEN, D. and B. WIEST. Free group automorphisms, invariant orderings, and applications. To appear.

(Reçu le 14 décembre 1999)

Hamish Short

Bert Wiest

CMI, Université de Provence

39, rue Joliot-Curie

F-13453 Marseille

France

*e-mail*: hamish@cmi.univ-mrs.fr

bertw@pims.ubc.ca