

**Zeitschrift:** L'Enseignement Mathématique  
**Herausgeber:** Commission Internationale de l'Enseignement Mathématique  
**Band:** 44 (1998)  
**Heft:** 3-4: L'ENSEIGNEMENT MATHÉMATIQUE

**Artikel:** HOMFLY POLYNOMIAL VIA AN INVARIANT OF COLORED PLANE GRAPHS  
**Autor:** Murakami, Hitoshi / Yamada, Shuji

**Bibliographie**  
**DOI:** <https://doi.org/10.5169/seals-63908>

### **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>**

8 <sub>17</sub>	$q^{n+2} - 2q^{n+1} + 3q^n - 2q^{n-1} + q^{n-2} - q^3 + 2q^2 - 4q + 5 - 4q^{-1} + 2q^{-2}$ $- q^{-3} + q^{-n+2} - 2q^{-n+1} + 3q^{-n} - 2q^{-n-1} + q^{-n-2}$
8 <sub>18</sub>	$q^{n+2} - 3q^{n+1} + 3q^n - 3q^{n-1} + q^{n-2} - q^3 + 3q^2 - 4q + 7 - 4q^{-1} + 3q^{-2}$ $- q^{-3} + q^{-n+2} - 3q^{-n+1} + 3q^{-n} - 3q^{-n-1} + q^{-n-2}$
8 <sub>19</sub>	$q^{-3n+3} + q^{-3n+1} + q^{-3n} + q^{-3n-1} + q^{-3n-3} - q^{-4n+2} - q^{-4n+1} - q^{-4n}$ $- q^{-4n-1} - q^{-4n-2} + q^{-5n}$
8 <sub>20</sub>	$-q^{2n+1} - q^{2n-1} + q^{n+2} + 2q^n + q^{n-2} - q + 1 - q^{-1}$
8 <sub>21</sub>	$q^{3n+1} - q^{3n} + q^{3n-1} - q^{2n+2} + q^{2n+1} - 3q^{2n} + q^{2n-1} - q^{2n-2} + 2q^{n+1}$ $- q^n + 2q^{n-1}$

## REFERENCES

- [1] FREYD, P., D. YETTER, J. HOSTE, W.B.R. LICKORISH, K. MILLETT and A. OCNEANU. A new polynomial invariant of knots and links. *Bull. Amer. Math. Soc. (N.S.)* 12 (1985), 239–246.
- [2] JIMBO, M. Quantum  $R$  matrix for the generalized Toda system. *Comm. Math. Phys.* 102 (1986), 537–547.
- [3] JONES, V.F.R. A polynomial invariant for knots via von Neumann algebras. *Bull. Amer. Math. Soc. (N.S.)* 12 (1985), 103–111.
- [4] — On knot invariants related to some statistical mechanical models. *Pacific J. Math.* 137 (1989), 311–336.
- [5] KAUFFMAN, L.H. State models and the Jones polynomial. *Topology* 26 (1987), 395–407.
- [6] KIRBY, R. and P. MELVIN. The 3-manifold invariants of Witten and Reshetikhin–Turaev for  $\mathfrak{sl}(2, \mathbb{C})$ . *Invent. Math.* 105 (1991), 473–545.
- [7] KIRILLOV, A.N. and N.YU. RESHETIKHIN. Representations of the algebra  $U_q(\mathfrak{sl}(2))$ ,  $q$ -orthogonal polynomials and invariants of links. *Infinite Dimensional Lie Algebras and Groups*. V.G. Kac, ed., Advanced Series in Mathematical Physics, vol. 7, World Scientific, Singapore, 1989.
- [8] KUPERBERG, G. The quantum  $G_2$  link invariant. *Internat. J. Math.* 5 (1994), 61–85.
- [9] LICKORISH, W.B.R. The skein method for three-manifold invariants. *J. Knot Theory Ramifications* 2 (1993), 171–194.
- [10] — *An Introduction to Knot Theory*. Graduate Texts in Mathematics, vol. 175, Springer-Verlag, 1997.
- [11] MORTON, H.R. Invariants of links and 3-manifolds from skein theory and from quantum groups. *Topics in Knot Theory*. M.E. Bozhüyük, ed., Kluwer, 1993.

- [12] OHTSUKI, T. and S. YAMADA. Quantum  $SU(3)$  invariants of 3-manifolds via linear skein theory. *J. Knot Theory Ramifications* 6 (1997), 373–404.
- [13] PRZYTYCKI, J.H. and P. TRACZYK. Invariant of links of Conway type. *Kobe J. Math.* 4 (1988), 115–139.
- [14] RESHETIKHIN, N. YU. and V.G. TURAEV. Ribbon graphs and their invariants derived from quantum groups. *Comm. Math. Phys.* 127 (1990), 1–26.
- [15] ROLFSEN, D. *Knots and Links*. Mathematics Lecture Series, vol. 7, Publish or Perish, Inc., Houston, Texas, 1990. Second printing, with corrections.
- [16] TURAEV, V.G. The Yang-Baxter equation and invariants of links. *Invent. Math.* 92 (1988), 527–553.
- [17] YOKOTA, Y. Skeins and quantum  $SU(N)$  invariants of 3-manifolds. *Math. Ann.* 307 (1997), 109–138.

(Reçu le 10 mars 1998)

Hitoshi Murakami

Department of Mathematics  
School of Science and Engineering  
Waseda University  
Ohkubo, Shinjuku-ku  
Tokyo 169  
Japan  
*email* : hitoshi@uguisu.co.jp

Tomotada Ohtsuki

Department of Mathematical and Computing Sciences  
Tokyo Institute of Technology  
Oh-Okayama, Meguro-ku  
Tokyo 152  
Japan  
*email* : tomotada@is.titech.ac.jp

Shuji Yamada

Department of Computer Science  
Kyoto Sangyo University  
Kamigamo Motoyama, Kita-ku  
Kyoto 603  
Japan  
*email* : yamada@cc.kyoto-su.ac.jp