

BIBLIOGRAPHY FOR MY LECTURES

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Much of the background on Riemann surfaces and Fuchsian groups can be found in [19], with [10] a more advanced alternative. For groups acting on the hyperbolic plane, especially the modular group and its subgroups, see [31]. For groups acting on more general surfaces see [46], or [27] which deals with this topic in the wider context of combinatorial group theory. For covering space theory (in Topology), see [32, 33].

For maps on surfaces, see [18], or Chapter 8 of [9]. Hypermaps were introduced by Cori in [6], and the theory was developed by him and Machi; see [7] for an excellent survey. The link with bipartite maps is due to Walsh [42].

Dessins were introduced in 1984 by Grothendieck in a set of notes [15] which were circulated but not published until 1997. (He withdrew from the mathematical community soon after writing those notes, and died in 2014.) See [13, 21, 25] for detailed accounts.

There are many good books on general Group Theory: my favourites are [30] and [36]. The same remark applies to Galois Theory; I like [37] (the 2nd edition is much better than the 1st). The best source for the finite simple groups is [43]; for profinite groups see [35]. Conder, who proved in [4] that all but finitely many alternating groups are Hurwitz groups, has written two excellent surveys on Hurwitz groups in [5, 8].

REFERENCES

- [1] G. V. Belyi, On Galois extensions of a maximal cyclotomic field (Russian), *Izv. Akad. Nauk SSSR Ser. Mat.* **43** (1979), 267–276, 479. English translation: *Math. USSR Izvestija* 14 (1980), 247–256.
- [2] E. S. Bring and S. G. Sommelius, *Meletemata quaedam mathematica circa transformationem aequationem algebraicarum*, Promotionschrift, Univ. Lund, 1786.
- [3] W. Burnside, Note on the simple group of order 504, *Math. Ann.* 52 (1899), 174–176.
- [4] M. Conder, Generators for alternating and symmetric groups, *J. London Math. Soc.* **22** (1980), 75–86.
- [5] M. Conder, Hurwitz groups: a brief survey, *Bull. Amer. Math. Soc. (N.S.)* 23 (1990), 359–370.
- [6] R. Cori, Un code pour les graphes planaires et ses applications, *Astérisque* 27, Soc. Math. France, Paris, 1975.
- [7] R. Cori and A. Machi, Maps, hypermaps and their automorphisms: a survey, I, II, III, *Exposition. Math.* 10 (1992), 403–427, 429–447, 449–467.
- [8] M. Conder, An update on Hurwitz groups, *Groups, Complex. Cryptol.* **2** (2010), 35–49.
- [9] H. S. M. Coxeter and W. O. J. Moser, *Generators and Relations for Discrete Groups* (3rd ed.), Springer-Verlag, Berlin - Heidelberg - New York, 1972.
- [10] H. M. Farkas and I. Kra, *Riemann Surfaces*, Springer, Berlin, 1991.
- [11] R. Fricke, Ueber eine einfache Gruppe von 504 Substitutionen, *Math. Ann.* 52 (1899), 321–339.
- [12] E. Gironde and G. González-Diez, A note on the action of the absolute Galois group on dessins, *Bull. Lond. Math. Soc.* 39 (2007), 721–723.
- [13] E. Gironde and G. González-Diez, *Introduction to Compact Riemann Surfaces and Dessins d’Enfants*, London Math. Soc. Student Texts 79, Cambridge University Press, Cambridge, 2012.

- [14] G. González-Diez and A. Jaikin-Zapirain, The absolute Galois group acts faithfully on regular dessins and on Beauville surfaces, *Proc. London Math. Soc.* (3) **111** (2015), 775–796.
- [15] A. Grothendieck, Esquisse d’un Programme (1984), in *Geometric Galois Actions, I*, L. Schneps and P. Lochak eds., London Math. Soc. Lect. Notes Ser. 242, Cambridge University Press, Cambridge, 1997, 5–47.
- [16] W. R. Hamilton, Letter to John T. Graves on the icosian, in *The Mathematical Papers of Sir William Rowan Hamilton, vol. III, Algebra* (eds. H. Halberstam and R. E. Ingram), Cambridge Univ. Press, Cambridge, 1967, pp. 612–625.
- [17] A. Hurwitz, Über algebraische Gebilde mit Eindeutigen Transformationen in sich, *Math. Ann.* 41 (1893), 403–442.
- [18] G. A. Jones and D. Singerman, Theory of maps on orientable surfaces. *Proc. London Math. Soc.* 37 (1978), 273–307.
- [19] G. A. Jones and D. Singerman, *Complex Function Theory: an Algebraic and Geometric Viewpoint*, Cambridge Univ. Press, Cambridge, 1987.
- [20] G. A. Jones and M. Streit, Galois groups, monodromy groups and cartographic groups, *Geometric Galois Actions 2*, London Math. Soc. Lecture Note Ser. 243, Cambridge Univ. Press, Cambridge, 1997, pp. 25–65.
- [21] G. A. Jones and J. Wolfart, *Dessins d’Enfants on Riemann Surfaces*, Springer, 2016.
- [22] F. Klein, Über die Transformationen siebenter Ordnung der elliptischen Functionen, *Math. Ann.* 14 (1878/1879), 428–497.
- [23] P. Koebe, Über die Uniformisierung beliebiger analytischer Kurven, *Göttinger Nachr.* 191–210 (1907), 633–669.
- [24] B. Koeck, Belyi’s theorem revisited, *Beiträge Algebra Geom.* 45 (2004), 253–265.
- [25] S. K. Lando and A. K. Zvonkin, *Graphs on Surfaces and their Applications*, Encyclopedia of Mathematical Sciences 141, Springer-Verlag, Berlin - Heidelberg, 2004.
- [26] A. Lucchini, M. C. Tamburini and J. S. Wilson, Hurwitz groups of large rank, *J. London Math. Soc.* (2) 61 (2000), 81–92.
- [27] R. C. Lyndon and P. E. Schupp, *Combinatorial Group Theory*, Springer-Verlag, Berlin - Heidelberg, 2001.
- [28] A. M. Macbeath, On a theorem of Hurwitz, *Proc. Glasgow Math. Assoc.* 5 (1961), 90–96.
- [29] A. M. Macbeath, *Generators of the linear fractional groups*, Number Theory, Proc. Sympos. Pure Math. XII, 1967 (Amer. Math. Soc., Providence, RI, 1969), 14–32.
- [30] A. Machì, *Groups: An Introduction to Ideas and Methods of the Theory of Groups*, Springer, Milan, 2012.
- [31] W. Magnus, *Noneuclidean Tessellations and their Groups*, Academic Press, New York and London, 1974.
- [32] W. S. Massey, *Algebraic Topology: An Introduction*, Harcourt, Brace & World, New York, 1967.
- [33] J. R. Munkres, *Topology* (2nd ed.), Prentice Hall, Upper Saddle River, NJ, 2000.
- [34] H. Poincaré, Sur l’uniformisation des fonctions analytiques, *Acta Math.* 31 (1907), 1–63.
- [35] L. Ribes and P. Zalesskii, *Profinite Groups*, Springer, 2010.
- [36] J. J. Rotman, *An Introduction to the Theory of Groups* (4th ed.), Graduate Texts in Mathematics 148, Springer-Verlag, New York, 1995.
- [37] J. J. Rotman *Galois Theory* (2nd ed.), Universitext, Springer-Verlag, New York, 1998.
- [38] L. Schneps, Dessins d’enfants on the Riemann sphere, in *The Grothendieck Theory of Dessins d’enfants (Luminy, 1993)*, London Math. Soc. Lecture Note Ser. 200, Cambridge Univ. Press, Cambridge, 1994, pp. 47–77.
- [39] H. A. Schwarz, Ueber diejenigen algebraischen Gleichungen zwischen zwei veränderlichen Grossen, welche eine Schaar rationaler, eindeutig umkehrbarer Transformationen in sich selbst zulassen, *J. reine angew. Math.* 87 (1890), 139–145.
- [40] D. Singerman, Subgroups of Fuchsian groups and finite permutation groups, *Bull. London Math. Soc.* 2 (1970), 319–323.
- [41] M. Streit, Field of definition and Galois orbits for the Macbeath–Hurwitz curves, *Arch. Math. (Basel)* 74 (2000), 342–349.
- [42] T. R. S. Walsh, Hypermaps versus bipartite maps, *J. Combin. Theory Ser. B* 18 (1975), 55–63.
- [43] R. A. Wilson, *The Finite Simple Groups*, Springer, London, 2009.

- [44] J. Wolfart, The “obvious” part of Belyi’s theorem and Riemann surfaces with many automorphisms, in *Geometric Galois Actions, 1*, London Math. Soc. Lecture Note Ser. 242, Cambridge Univ. Press, Cambridge, 1997, pp. 97–112.
- [45] J. Wolfart, ABC for polynomials, dessins d’enfants and uniformization – a survey, in *Elementare und analytische Zahlentheorie*, Schr. Wiss. Ges. Johann Wolfgang Goethe Univ. Frankfurt am Main 20, Franz Steiner Verlag Stuttgart, Stuttgart, 2006, pp. 313–345.
- [46] H. Zieschang, E. Vogt and H-D. Coldewey, *Surfaces and Planar Discontinuous Groups*, Lecture Notes in Math. 835, Springer, Berlin, 1980.

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