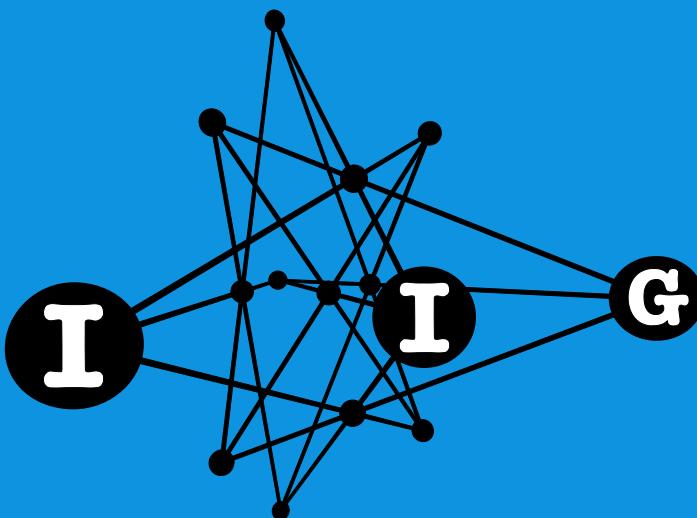
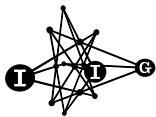


Innovations in Incidence Geometry

Algebraic, Topological and Combinatorial



Preface



Preface

Together with Francis Buekenhout and Jean-Pierre Tignol we have edited the *Collected Works* of Jacques Tits, whose four volumes were published in 2013 by the European Mathematical Society in the series *Heritage of European Mathematics*. Not all of Tits' papers were included in the *Collected Works* for reasons explained there in the Notes by the editors.

During the preparation of the *Collected Works* we assembled an almost complete collection of Tits' writings. In view of the huge impact of Tits' work we felt it desirable to make the remaining works available to the mathematical community. We thus decided to put the material that was not included in the *Collected Works* in the present special volume of *Innovations in Incidence Geometry*.

We are grateful to Jacques Tits for agreeing to this project. We had the support of several people and institutions. We would like to thank our co-editors Francis Buekenhout and Jean-Pierre Tignol since this supplement profited a lot from the work that was done before, during the preparation of the *Collected Works*. Special thanks go to Bertrand Rémy and Jean-Pierre Serre. We are also grateful to Franz Bingen, Pierre De la Harpe, Narasimha Sastry, Jef Thas, Guy Valette and Stefan Witzel for supporting us in various ways. Anneleen De Schepper and Beukje Temmermans did a great job helping prepare the scans for publication. Finally we would like to thank the Département des manuscrits et des archives privés de la Bibliothèque de Genève, the Service de documentation de Lyon 1 and the Réseau des bibliothèques de maths en France for their support.

March 2018

BERNHARD M. MÜHLHERR:

bernhard.m.muehlherr@math.uni-giessen.de

Mathematisches Institut, Universität Giessen, 35392 Giessen, Germany

HENDRIK J. VAN MALDEGHEM:

hendrik.vanmaldeghem@ugent.be

Vakgroep Wiskunde: Algebra en Meetkunde, University of Ghent, 9000 Gent, Belgium

Acknowledgements

The editors thank the following organizations for granting permission to include in this special volume of *Innovations in Incidence Geometry* the articles listed below. The numbers in brackets refer to the [general bibliography](#) of Jacques Tits (or see the table of contents on pages 5–7).

- Académie de sciences de l’Institut de France: [19], [20], [21], [70], [71], [72], [73], [131]
- Belgian Mathematical Society: [6], [7], [8], [13], [17], [34]
- Fondatione CIME Roberto Conti: [39]
- Österreichische Mathematische Gesellschaft: [12]
- Société Mathématique de France: [134]
- Springer Science + Business Media B.V.: [25]
- Tata Institute of Fundamental Research: [80]

Contents

Research and expository articles

- [5] Groupes triplement transitifs et généralisations, in *Algèbre et théorie des nombres, Paris, 25 septembre – 1er octobre 1949*, Colloques Internationaux du Centre National de la Recherche Scientifique **24**, CNRS, Paris (1950), 207–208. [page 9](#)
- [6] Généralisation d'un théorème de Kerékjártó, in *III^e Congrès National des Sciences - Bruxelles 1950*, Brussels, July 1950, 64–65. [page 13](#)
- [7] Collinéations et transitivité, in *III^e Congrès National des Sciences - Bruxelles 1950*, Brussels, July 1950, 66–67. [page 17](#)
- [8] Les groupes projectifs : évolution et généralisations, *Bull. Soc. Math. Belg.* **3** (1949–1950), 1–10. [page 21](#)
- [12] Caractérisation topologique de certains espaces métriques, *Nachr. Österr. Math. Ges.* **21/22** (1952) = *Bericht über den III. Österreichischen Mathematikerkongress, Salzburg, 9. – 14. IX. 1952*, p. 51. [page 33](#)
- [13] Étude de certains espaces métriques, *Bull. Soc. Math. Belg.* **5** (1952), 44–52. [page 37](#)
- [17] Sur un article précédent : « Étude de certains espaces métriques », *Bull. Soc. Math. Belg.* **6** (1953), 126–127. [page 47](#)
- [19] Étude géométrique d'une classe d'espaces homogènes, *C. R. Acad. Sci. Paris* **239** (1954), 466–468. [page 51](#)
- [20] Espaces homogènes et isotropes, et espaces doublement homogènes, *C. R. Acad. Sci. Paris* **239** (1954), 526–527. [page 55](#)
- [21] Sur les R-espaces, *C. R. Acad. Sci. Paris* **239** (1954), 850–852. [page 59](#)
- [25] Espaces homogènes et isotropes de la relativité, in *Fünfzig Jahre Relativitätstheorie – Verhandlungen, Bern, 11.–16. Juli 1955 / Cinquantenaire de la théorie de la relativité – Actes / Jubilee of relativity theory – Proceedings = Helv. Phys. Acta, Suppl. IV*, Birkhäuser Verlag, Basel (1956), 46–47. [page 63](#)
- [34] Isotropie des espaces de Klein, in *Colloque de géométrie différentielle globale*, Bruxelles, 19–22 décembre 1958, Centre Belge de Recherches Mathématiques, Librairie Universitaire, Louvain, and Gauthier-Villars, Paris, 1959, 153–161. [page 67](#)
- [39] Sur les groupes algébriques affins : théorèmes fondamentaux de structure; classification des groupes semisimples et géométries associées, in *Gruppi, anelli di Lie e teoria della coomologia, Centro Internazionale Matematico Estivo (C.I.M.E.), Saltino di Val-lombrosa, 31 agosto – 8 settembre 1959*, Istituto Matematico dell'Università, Roma (1960). [page 79](#)

- [62] Simple groups over local fields, mimeographed notes from the Summer Institute on Algebraic Groups, Boulder, July 1965, I–G. [page 159](#)
- [69] Un théorème de point fixe, mimeographed notes, I.H.E.S., Bures-sur-Yvette, 1966. With François Bruhat. [page 167](#)
- [70] BN-paires de type affine et données radicielles, *C. R. Acad. Sci. Paris Sér. A Math.* **263** (1966), 598–601. With François Bruhat. [page 203](#)
- [71] Groupes simples résiduellement déployés sur un corps local, *C. R. Acad. Sci. Paris Sér. A Math.* **263** (1966), 766–768. With François Bruhat. [page 209](#)
- [72] Groupes algébriques simples sur un corps local, *C. R. Acad. Sci. Paris Sér. A Math.* **263** (1966), 822–825. With François Bruhat. [page 213](#)
- [73] Groupes algébriques simples sur un corps local : cohomologie galoisienne, décompositions d’Iwasawa et de Cartan, *C. R. Acad. Sci. Paris Sér. A Math.* **263** (1966), 867–869. With François Bruhat. [page 219](#)
- [80] On “abstract” homomorphisms of simple algebraic groups, in *Algebraic geometry: papers presented at the Bombay Colloquium 1968*, Tata Inst. Fund. Res. Stud. Math. **4**, Oxford University Press, Oxford (1969), 75–82. With Armand Borel. [page 225](#)
- [87] Homomorphismes et automorphismes “abstraits” de groupes algébriques et arithmétiques, in *Actes du Congrès International des Mathématiciens 1970*, vol. 2, Gauthier-Villars, Paris (1971), 349–355. [page 235](#)
- [117] Géométrie de l’espace, du temps et de la causalité : la voie axiomatique, Excerpts from a conference held at Halle in 1980, *Mélanges Paul Libois*, Brussels (1981), 291–296. [page 245](#)
- [118] Exposé sur les mathématiques, fait à l’occasion du 450e anniversaire du Collège de France, *Comptes Rendus de la réunion extraordinaire de l’assemblée des professeurs*, Collège de France, October 1981, pp. 9–11. [page 253](#)
- [121] Algèbres enveloppantes et groupes de Chevalley généralisés, in *Actes des Journées Groupes et langages*, Amiens, May 1981. [page 259](#)
- [131] Symétries, *C. R. Acad. Sci. Paris Sér. Gén. Vie Sci.* **2** (1985), 13–25. [page 267](#)
- [134] Avatars des grands théorèmes de classification d’Élie Cartan, *Élie Cartan et les mathématiques d’aujourd’hui / The mathematical heritage of Elie Cartan*, Lyon, 25–29 juin 1984 = *Astérisque*, n° hors série, Société Mathématique de France, Paris (1985), 439–440. [page 283](#)

Popularization articles

- [A2] Espaces et nombres, *Qu'est-ce que l'univers?*, edited by Yves Michaud, Université de tous les savoirs **4**, Odile Jacob, Paris (2001), 77–85. [page 287](#)
- [A3] Jules-Henri Poincaré, *Célébrations Nationales 2004*, Direction des archives de France, Paris, 2003, p. 246. [page 299](#)

Lecture notes

- [B3] Notions de géométrie algébrique, notes of the seminar *Notions de géométrie algébrique*, Université Libre de Bruxelles (Brussels, 1961–62). With Franz Bingen. [page 301](#)
- [B4] Séminaire sur les algèbres de Banach, notes of the *Séminaire sur les Algèbres de Banach*, Université Libre de Bruxelles (Brussels, 1962–63). [page 339](#)
- [B5] Algèbres de Lie semi-simples et systèmes de racines, notes of the seminar *Algèbres de Lie semi-simples et systèmes de racines*, Université Libre de Bruxelles (Brussels, 1963–64). With Firmin Brataslavski and Guy Valette. [page 487](#)

Bibliography

- Liste complète des publications de Jacques Tits [page 549](#)

Innovations in Incidence Geometry

msp.org/iig

MANAGING EDITOR

Tom De Medts	Ghent University tom.demedts@ugent.be
Linus Kramer	Universität Münster linus.kramer@wwu.de
Klaus Metsch	Justus-Liebig Universität Gießen klaus.metsch@math.uni-giessen.de
Bernhard Mühlherr	Justus-Liebig Universität Gießen bernhard.m.muehlherr@math.uni-giessen.de
Joseph A. Thas	Ghent University thas.joseph@gmail.com
Koen Thas	Ghent University koen.thas@gmail.com
Hendrik Van Maldeghem	Ghent University hendrik.vanmaldeghem@ugent.be

HONORARY EDITORS

Jacques Tits
Ernest E. Shult †

EDITORS

Peter Abramenko	University of Virginia
Francis Buekenhout	Université Libre de Bruxelles
Philippe Cara	Vrije Universiteit Brussel
Antonio Cossidente	Università della Basilicata
Hans Cuypers	Eindhoven University of Technology
Bart De Bruyn	University of Ghent
Alice Devillers	University of Western Australia
Massimo Giulietti	Università degli Studi di Perugia
James Hirschfeld	University of Sussex
Dimitri Leemans	Université Libre de Bruxelles
Oliver Lorscheid	Instituto Nacional de Matemática Pura e Aplicada (IMPA)
Guglielmo Lunardon	Università di Napoli “Federico II”
Alessandro Montinaro	Università di Salento
James Parkinson	University of Sydney
Antonio Pasini	Università di Siena (emeritus)
Valentina Pepe	Università di Roma “La Sapienza”
Bertrand Rémy	École Polytechnique
Tamás Szonyi	ELTE Eötvös Loránd University, Budapest

PRODUCTION

Silvio Levy (Scientific Editor)
production@msp.org

See inside back cover or msp.org/iig for submission instructions.

The subscription price for 2019 is US \$275/year for the electronic version, and \$325/year (+\$20, if shipping outside the US) for print and electronic. Subscriptions, requests for back issues and changes of subscriber address should be sent to MSP.

Innovations in Incidence Geometry: Algebraic, Topological and Combinatorial (ISSN 2640-7345 electronic, 2640-7337 printed) at Mathematical Sciences Publishers, 798 Evans Hall #3840, c/o University of California, Berkeley, CA 94720-3840 is published continuously online. Periodical rate postage paid at Berkeley, CA 94704, and additional mailing offices.

IIG peer review and production are managed by EditFlow® from MSP.

PUBLISHED BY

 **mathematical sciences publishers**
nonprofit scientific publishing
<http://msp.org/>

© 2019 Mathematical Sciences Publishers

Innovation in Incidence Geometry

Vol. 16 No. 1

2018

Complement to the Collected Works of Jacques Tits

edited by Bernhard Mühlherr and Hendrik Van Maldeghem

This volume contains 31 writings of Jacques Tits that were not included in his four-volume *Œuvres – Collected Works*, published by the European Mathematical Society in 2013 in the series Heritage of European Mathematics.

