

UNIVERSITY OF CALIFORNIA
SANTA CRUZ

A SUPER AWESOME TITLE OF EXCELLENT WORK

A dissertation submitted in partial satisfaction
of the requirements for the degree of

DOCTOR OF PHILOSOPHY

in

MATHEMATICS

by

Your name

June 2023

The Dissertation of Your name
is approved:

Professor Chair, Chair

Professor 1

Professor 2

Peter Biehl
Vice Provost and Dean of Graduate Studies

Copyright © by

Your name

2023

Contents

Abstract	iv
Dedication	v
Acknowledgments	vi
References	1

Abstract

A super awesome title of excellent work

by

Your name

This is abstract!

Yes. Abstract.

For whatever

Acknowledgements

Thanks

Bibliography

- [1] Jeffrey D. Adler, *Refined anisotropic K -types and supercuspidal representations*, Pacific J. Math. **185** (1998), no. 1, 1–32.
- [2] Jeffrey D. Adler and Stephen DeBacker, *Some applications of Bruhat-Tits theory to harmonic analysis on the Lie algebra of a reductive p -adic group*, Michigan Math. J. **50** (2002), no. 2, 263–286.
- [3] Dan Barbasch and Allen Moy, *A new proof of the Howe conjecture*, J. Amer. Math. Soc. **13** (2000), no. 3, 639–650.
- [4] I. N. Bernstein, I. M. Gel’fand, and S. I. Gel’fand, *Schubert cells, and the cohomology of the spaces G/P* , Uspehi Mat. Nauk **28** (1973), no. 3(171), 3–26 (Russian).
- [5] Nicolas Bourbaki, *Lie groups and Lie algebras. Chapters 4–6*, Elements of Mathematics (Berlin), Springer-Verlag, Berlin, 2002. Translated from the 1968 French original by Andrew Pressley.
- [6] Siegfried Bosch, Werner Lütkebohmert, and Michel Raynaud, *Néron models*, Ergebnisse der Mathematik und ihrer Grenzgebiete (3) [Results in Mathematics and Related Areas (3)], vol. 21, Springer-Verlag, Berlin, 1990.
- [7] Armand Borel, *Sur la cohomologie des espaces fibrés principaux et des espaces homogènes de groupes de Lie compacts*, Ann. of Math. (2) **57** (1953), 115–207 (French).
- [8] A. Borel and J.-P. Serre, *Corners and arithmetic groups*, Comment. Math. Helv. **48** (1973), 436–491.
- [9] ———, *Cohomologie d’immeubles et de groupes S -arithmétiques*, Topology **15** (1976), no. 3, 211–232 (French).

BIBLIOGRAPHY

- [10] Armand Borel and Jacques Tits, *Groupes réductifs*, Publications Mathématiques de l’IHÉS **27** (1965), 55–151.
- [11] François Bruhat and Jacques Tits, *Groupes réductifs sur un corps local : I. Données radicielles valuées*, Publications Mathématiques de l’IHÉS **41** (1972), 5–251.
- [12] ———, *Groupes réductifs sur un corps local : II. Schémas en groupes. Existence d’une donnée radicielle valuée*, Publications Mathématiques de l’IHÉS **60** (1984), 5–184.
- [13] ———, *Schémas en groupes et immeubles des groupes classiques sur un corps local*, Bull. Soc. Math. France **112** (1984), no. 2, 259–301.
- [14] ———, *Schémas en groupes et immeubles des groupes classiques sur un corps local. II. Groupes unitaires*, Bull. Soc. Math. France **115** (1987), no. 2, 141–195.
- [15] A.D.R. Choudary and C.P. Niculescu, *Real Analysis on Intervals*, Springer India, 2014.
- [16] Ching-Li Chai and Jiu-Kang Yu, *Congruences of Néron models for tori and the Artin conductor*, Ann. of Math. (2) **154** (2001), no. 2, 347–382. With an appendix by Ehud de Shalit.
- [17] Stephen DeBacker, *Homogeneity results for invariant distributions of a reductive p -adic group*, Ann. Sci. École Norm. Sup. (4) **35** (2002), no. 3, 391–422.
- [18] ———, *Some applications of Bruhat-Tits theory to harmonic analysis on a reductive p -adic group*, Michigan Math. J. **50** (2002), no. 2, 241–261.
- [19] ———, *Parametrizing nilpotent orbits via Bruhat-Tits theory*, Ann. of Math. (2) **156** (2002), no. 1, 295–332.
- [20] Jessica Fintzen and Beth Romano, *Stable vectors in Moy-Prasad filtrations*, Compos. Math. **153** (2017), no. 2, 358–372.
- [21] Jessica Fintzen, *On the Moy-Prasad filtration*, J. Eur. Math. Soc. (JEMS) **23** (2021), no. 12, 4009–4063.
- [22] ———, *On the construction of tame supercuspidal representations*, Compos. Math. **157** (2021), no. 12, 2733–2746.

BIBLIOGRAPHY

- [23] Paul Garrett, *Buildings and classical groups*, Chapman & Hall, London, 1997.
- [24] O. Goldman and N. Iwahori, *The space of \mathfrak{p} -adic norms*, Acta Math. **109** (1963), 137–177.
- [25] Mikhail Gromov and Richard Schoen, *Harmonic maps into singular spaces and p -adic superrigidity for lattices in groups of rank one*, Inst. Hautes Études Sci. Publ. Math. **76** (1992), 165–246.
- [26] Steven S. Gubser, Johannes Knaute, Sarthak Parikh, Andreas Samberg, and Przemek Witaszczyk, *p -adic AdS/CFT*, Comm. Math. Phys. **352** (2017), no. 3, 1019–1059.
- [27] Yves Guivarc’h and Bertrand Rémy, *Group-theoretic compactification of Bruhat-Tits buildings*, Ann. Sci. École Norm. Sup. (4) **39** (2006), no. 6, 871–920 (English, with English and French summaries).
- [28] Hiroaki Hijikata, *On the structure of semi-simple algebraic groups over valuation fields. I*, Japan. J. Math. (N.S.) **1** (1975), no. 2, 225–300.
- [29] N. Iwahori and H. Matsumoto, *On some Bruhat decomposition and the structure of the Hecke rings of \mathfrak{p} -adic Chevalley groups*, Inst. Hautes Études Sci. Publ. Math. **25** (1965), 5–48.
- [30] Lizhen Ji, *Large scale geometry, compactifications and the integral Novikov conjectures for arithmetic groups*, Third International Congress of Chinese Mathematicians. Part 1, 2, AMS/IP Stud. Adv. Math., 42, pt. 1, vol. 2, Amer. Math. Soc., Providence, RI, 2008, pp. 317–344.
- [31] ———, *Buildings and their applications in geometry and topology*, Differential geometry, Adv. Lect. Math. (ALM), vol. 22, Int. Press, Somerville, MA, 2012, pp. 89–210.
- [32] Michael Joswig, Bernd Sturmfels, and Josephine Yu, *Affine buildings and tropical convexity*, Albanian J. Math. **1** (2007), no. 4, 187–211.
- [33] Erasmus Landvogt, *A compactification of the Bruhat-Tits building*, Lecture Notes in Mathematics, vol. 1619, Springer-Verlag, Berlin, 1996.
- [34] ———, *Some functorial properties of the Bruhat-Tits building*, J. Reine Angew. Math. **518** (2000), 213–241.
- [35] Serge Lang, *Algebra*, 3rd ed., Graduate Texts in Mathematics, vol. 211, Springer-Verlag, New York, 2002.

BIBLIOGRAPHY

- [36] J. S. Milne, *Algebraic groups*, Cambridge Studies in Advanced Mathematics, vol. 170, Cambridge University Press, Cambridge, 2017.
- [37] Allen Moy and Gopal Prasad, *Unrefined minimal K -types for p -adic groups*, Invent. Math. **116** (1994), no. 1-3, 393–408.
- [38] ———, *Jacquet functors and unrefined minimal K -types*, Comment. Math. Helv. **71** (1996), no. 1, 98–121.
- [39] Gopal Prasad, *A new approach to unramified descent in Bruhat-Tits theory*, Amer. J. Math. **142** (2020), no. 1, 215–253.
- [40] ———, *Finite group actions on reductive groups and buildings and tamely-ramified descent in Bruhat-Tits theory*, Amer. J. Math. **142** (2020), no. 4, 1239–1267.
- [41] Gopal Prasad and Jiu-Kang Yu, *On finite group actions on reductive groups and buildings*, Invent. Math. **147** (2002), no. 3, 545–560.
- [42] M. S. Raghunathan, *Principal bundles admitting a rational section*, Invent. Math. **116** (1994), no. 1-3, 409–423.
- [43] Guy Rousseau, *Euclidean buildings*, Géométries à courbure négative ou nulle, groupes discrets et rigidités, 2009, pp. 77–116.
- [44] Bertrand Rémy, Amaury Thuillier, and Annette Werner, *Bruhat-Tits buildings and analytic geometry*, Berkovich spaces and applications, 2015, pp. 141–202.
- [45] ———, *An intrinsic characterization of Bruhat-Tits buildings inside analytic groups*, Michigan Math. J. **72** (2022), 543–557.
- [46] Michel Demazure and Alexander Grothendieck, *Schémas en groupes I, II, III, séminaire de géométrie algébrique 3*, Lecture Notes in Math, vol. 151,152,153, Springer-Verlag, Berlin, 1970.
- [47] Peter Schneider and Ulrich Stuhler, *Representation theory and sheaves on the Bruhat-Tits building*, Inst. Hautes Études Sci. Publ. Math. **85** (1997), 97–191.
- [48] Junecue Suh, *Stable lattices in p -adic representations I. regular reduction and schur algebra*, Journal of Algebra **575** (2021), 192–219.

BIBLIOGRAPHY

- [49] ———, *Stable lattices in p -adic representations II. Irregularity and entropy*, Journal of Algebra **591** (2022), 379–409.
- [50] Jeremy Teitelbaum, *The geometry of p -adic symmetric spaces*, Notices Amer. Math. Soc. **42** (1995), no. 10, 1120–1126.
- [51] Jacques Tits, *Buildings of spherical type and finite BN -pairs*, Lecture Notes in Mathematics, Vol. 386, Springer-Verlag, Berlin-New York, 1974.
- [52] ———, *Reductive groups over local fields*, Automorphic forms, representations and L -functions, Part 1, 1979, pp. 29–69.
- [53] Jiu-Kang Yu, *Construction of tame supercuspidal representations*, J. Amer. Math. Soc. **14** (2001), no. 3, 579–622.
- [54] ———, *Bruhat-Tits theory and buildings*, Ottawa lectures on admissible representations of reductive p -adic groups, 2009, pp. 53–77.
- [55] ———, *Smooth models associated to concave functions in Bruhat-Tits theory*, Autour des schémas en groupes, 2015, pp. 227–258.
- [56] Annette Werner, *Compactifications of Bruhat-Tits buildings associated to linear representations*, Proc. Lond. Math. Soc. (3) **95** (2007), no. 2, 497–518.
- [57] ———, *A tropical view on Bruhat-Tits buildings and their compactifications*, Cent. Eur. J. Math. **9** (2011), no. 2, 390–402.