

Rory Biggs

Bathurst
Eastern Cape, South Africa
✉ rorybiggs@gmail.com
🌐 rorybiggs.co.za
14 November, 2022

Professional Experience

- 2022–present **Freelance.**
- 2020–2022 **Senior Lecturer**, Department of Mathematics and Applied Mathematics, University of Pretoria.
- 2017–2019 **Lecturer**, Department of Mathematics and Applied Mathematics, University of Pretoria.
- 2015–2016 **Postdoctoral Research Fellow**, Department of Mathematics, Rhodes University.

Education

- 2012–2014 **PhD in Mathematics**, *Rhodes University*.
title Invariant control systems and sub-Riemannian structures on Lie groups: equivalence and isometries.
supervisors Dr C.C. Remsing (Rhodes University) and Prof P.T. Nagy (University of Debrecen, Hungary).
- 2010–2011 **MSc in Mathematics**, *Rhodes University*, with distinction.
title A study of four-dimensional oscillator groups and the associated left-invariant control affine systems.
supervisor Dr C.C. Remsing.
- 2009 **BSc with Honours in Mathematics**, *Rhodes University*, with distinction and academic honours.
- 2006–2008 **BSc in Pure and Applied Mathematics**, *Rhodes University*, with distinction and academic honours.

Research

Selected Publications*

- 2018 D.I. Barrett, R. Biggs, C.C. Remsing, Quadratic Hamilton–Poisson systems on $\mathfrak{se}(1, 1)_*$: the inhomogeneous case. *Acta Appl. Math.* 154 (2018), 189–230.
- 2017 R. Biggs, Isometries of Riemannian and sub-Riemannian structures on three-dimensional Lie groups. *Commun. Math.* 25 (2017), 99–135.

*Full texts for most publications are available on ResearchGate https://www.researchgate.net/profile/Rory_Biggs/contributions. A complete publication lists can also be found on my ORCID page <http://orcid.org/0000-0002-6388-7839>.

- R. Biggs, C.C. Remsing, Quadratic Hamilton–Poisson systems in three dimensions: equivalence, stability, and integration. *Acta Appl. Math.* 148(2017), 1–59.
- R. Biggs, C.C. Remsing, Invariant control systems on Lie groups. In: G. Falcone (ed.), *Lie Groups, Differential Equations, and Geometry: Advances and Surveys*, Springer, 2017, 127–181.
- C.E. Bartlett, R. Biggs, C.C. Remsing, Control systems on nilpotent Lie groups of dimension ≤ 4 : equivalence and classification. *Differential Geom. Appl.*, 54(2017), 282–297.
- R. Biggs, G. Falcone, A class of nilpotent Lie algebras admitting a compact subgroup of automorphisms. *Differential Geom. Appl.* 54(2017), 251–263.
- 2016 R. Biggs, P.T. Nagy, On sub-Riemannian and Riemannian structures on the Heisenberg groups. *J. Dyn. Control Syst.* 22(2016), 563–594.
- D.I. Barrett, R. Biggs, C.C. Remsing, O. Rossi, Invariant nonholonomic Riemannian structures on three-dimensional Lie groups. *J. Geom. Mech.* 8(2016), 139–167.
- R. Biggs, C.C. Remsing, On the classification of real four-dimensional Lie groups. *J. Lie Theory.* 26(2016), 1001–1035.
- R. Biggs, P.T. Nagy, On extensions of sub-Riemannian structures on Lie groups. *Differential Geom. Appl.* 46(2016), 25–38.
- C.E. Bartlett, R. Biggs, C.C. Remsing, Control systems on the Heisenberg group: equivalence and classification. *Publ. Math. Debrecen* 88(2016), 217–234.
- 2015 D.I. Barrett, R. Biggs, C.C. Remsing, Quadratic Hamilton-Poisson systems on $\mathfrak{se}(1,1)^*$: the homogeneous case. *Int. J. Geom. Methods Mod. Phys.* 12(2015), 1550011 (17 pages).
- 2014 R. Biggs, C.C. Remsing, Some remarks on the oscillator group. *Differential Geom. Appl.* 35(2014), 199–209.
- R. Biggs, C.C. Remsing, Control systems on three-dimensional Lie groups: equivalence and controllability. *J. Dyn. Control Syst.* 20(2014), 307–339.
- 2013 R. Biggs, P.T. Nagy, A classification of sub-Riemannian structures on the Heisenberg groups. *Acta Polytechnica Hungarica* 10(2013), 41–52.
- R.M. Adams, R. Biggs, C.C. Remsing, Two-input control systems on the Euclidean group SE(2). *ESAIM Control Optim. Calc. Var.* 19(2013), 947–975.

Selected Contributed Talks

- 2019 Sub-Riemannian structures on Lie groups. *School of Mathematics Seminar*, University of the Witwatersrand, South Africa.
- Morphisms of SR structures. *Second Mini-Symposium: Geometry Groups and Control*, Rhodes University, Grahamstown, South Africa.
- 2018 Sub-Riemannian structures on Lie groups. *Jyväskylä Geometry Seminar*, University of Jyväskylä, Jyväskylä, Finland.
- Sub-Riemannian structures on nilpotent Lie groups. *First Mini-Symposium: Geometry Groups and Control*, Rhodes University, Grahamstown, South Africa.
- 2016 Isometries of invariant sub-Riemannian structures on 3D Lie groups. *7th European Congress of Mathematics*, Berlin, Germany.
- Isometries of Riemannian and sub-Riemannian structures on 3D Lie groups. *13th International Conference on Differential Geometry and its Applications*, Brno, Czech Republic.

Sub-Riemannian structures on nilpotent Lie groups. *4th International Conference on Lie groups, Differential Equations and Geometry*, Modica, Italy.

2015 Riemannian and sub-Riemannian structures on the Heisenberg groups. *Workshop on Geometry, Lie Groups and Number Theory*, University of Ostrava, Czech Republic.

2014 Control systems on three-dimensional Lie groups: equivalence and controllability. *13th European Control Conference*, Strasbourg, France.

Teaching & Learning

Lecturing at University of Pretoria

2020–2021 Second-year undergraduate course in *Techniques of Analysis*, 26 lectures, approx. students.

2017–2021 First-year undergraduate course in *Calculus*, 55 lectures, 100–400 students.

2017–2019 Second-year course in *Analysis*, 26 lectures, approx. 200 students.

Lecturing at Rhodes University

2013 Third-year undergraduate course in *Dynamical systems*, 35 lectures, 19 students.

2012 Second-year undergraduate course in *Linear algebra*, 22 lectures, 36 students.

T&L Presentations

2019 Presentation “Flexible Toolbox,” *Flexible Futures conference*, Pretoria.

Presentation in Faculty’s “*Celebrating Teaching Excellence*” event, Faculty of Natural and Agricultural Sciences, University of Pretoria.

Presentation in Faculty’s “*Toolbox FLY@NAS event*,” Faculty of Natural and Agricultural Sciences, University of Pretoria

2018 Teaching & Learning: a Hotchpotch of Ideas, *Department of Humanities Education Seminar*, University of Pretoria.

Other

2018–present Co-Editor of the “T&L^{@NAS} Bulletin” (Faculty’s T&L newsletter), Faculty of Natural and Agricultural Sciences, University of Pretoria, <http://bit.ly/TLatUP>.

Awards & Scholarships

2020 University of Pretoria Teaching Excellence Award.

2019 Departmental Teaching Excellence Award, Department of Mathematics and Applied Mathematics, University of Pretoria.

2018 Achieved NRF “Y2” Rating, National research Foundation of South Africa.

PostDoc Claude Leon Postdoctoral Fellowship (2015–2016).

PhD DAAD/NRF PhD Scholarship (2012–2014).

Rhodes University Prestigious Scholarship (2012–2014).

MSc The Southern Africa Association for the Advancement of Science (S2A3) medal for original research at Masters level. Awarded annually by each South African university to the most outstanding Masters Degree research student in a scientific discipline (awarded in 2012).

NRF Prestigious Scholarship (2010–2011).

Rhodes University Prestigious (Henderson) Scholarship (2010–2011).

BSc (Hons) NRF Prestigious Scholarship (2009).

Rhodes University Prestigious (Henderson) Scholarship (2009).

Hendry Bradlow Scholarship. Awarded to the top honours graduate in the faculty of Science, Rhodes University (2009).

BSc Rhodes Foundation Scholarship. Awarded to the most outstanding graduate, Rhodes University (2008).

Rhodes University and Rhodes Governors Scholarships. Awarded to the top student in faculty of Science or Pharmacy, Rhodes University (2006, 2007).