Curriculum Vitae for Stephen P. Humphries

EDUCATION

University of Wales, 1974, B. Sc. in Pure and Applied Mathematics.
University of Wales, 1978, M.Sc. in Pure Mathematics:
            Dissertation on Kahler manifolds and Hamiltonian mechanics.
University of Wales, 1983, Ph.D. "Mapping class groups, graphs and symplectic geometry" (120 pages)

PROFESSIONAL EXPERIENCE

July 1987--present, Assistant Professor, Associate Professor, Professor, Brigham Young University.

July 1985--July 1987, Appointed the first Ky Fan Assistant Professorship at the University of California, Santa Barbara.

 July 1984--Aug. 1985, Ritt Assistant Professorship at Columbia University, New York.

Sept 1977- Feb 1981 Rolls Royce Areo-engine division, Filton, Bristol UK.

PUBLICATIONS

 1 'Generators for the Mapping Class Groups,' Springer Lecture Notes in Math 722(1979), 44--47.

2 (with R. Brown) 'Orbits Under Symplectic Transvections I,' Proc. London Math. Soc.(3) volume 52 (1986), 517--531.

 3 (with R. Brown) 'Orbits Under Symplectic Transvection II,' Proc. London Math. Soc.(3) volume 52 (1986), 532--556.

4   (with D. Johnson) 'A generalization of winding number functions on surfaces,' Proceedings of London Math. Soc.(3) volume   (1989), 366--386.

 5 'Graphs and Nielsen Transformations of Symmetric, Orthogonal and Symplectic groups,' Quarterly Journal Math. Oxford(2) volume 36 (1985), 297--313.

 6 'On Weakly Distinguished Bases and free Generating sets of free groups,' Quarterly J. Math. Oxford(2) volume 36 (1985), 215--219.

 7 'Generation of Special Linear Groups by Transvections,' Journal of Algebra volume 99 (1986), 480--495.

8 'Free subgroups of SL(n, Z), n > 2, generated by transvections,' Journal of Algebra, volume 116 (1988), 155--162.

9 (with D. D. Long) 'On the Mal'cev quotients of certain hyperbolic link groups,' Math. Proc. Cambridge Phil. Soc.volume 102(1987), 475--480.

10 'Free Products in Mapping Class Groups generated by Dehn Twists, 'Glasgow Journal of Mathematics, volume 31, (1989), 213--218.

11 'Some Subgroups of SL(3, Z) generated by involutions,' Glasgow Math. Journal, volume 32 (1990), 127--136.

12 'Split Braids,' Proc. Amer. Math. Soc., volume 113 (1991), 21--26.

13 'An approach to Automorphisms of Free Groups and Braids via transvections,' Mathematische Zeitschrift, volume 209 (1992), 131--152.

14 'Some subgroups of SL(3,Z) generated by transvections,' Communications in Algebra, volume 20(6) (1992), 1675--1703.

15 'Quotients of Coxeter complexes, Fundamental Groupoids and Regular graphs,' Math. Zeitsch, volume 217 (1994), 247--273.

16 'Normal Closures of Dehn Twists in Mapping Class groups,' Glasgow Math. Journal volume 34 (1992), 313--317.

17 'On Reducible Braids and Composite Braids,' Glasgow Math. J., volume 36 (1994), 197--199.

18 'On representations of Artin groups and the Tits Conjecture,' Journal of Algebra volume 169 (3), (1994), 847--862.

19 'A new characterisation of braid groups and rings of invariants for symmetric automorphism groups,' Math. Zeitsch, volume 224, 255-287 (1997).

20 'Cogrowth and the Dedekind-Frobenius group determinant,' Philosophical Proceedings of the Cambridge Math. Soc.,volume 121, 193-217 (1997), .

21 'Cogrowth of Groups and a matrix of Redheffer,' Linear Algebra and Applications, volume 265 (1997) 101-117 .

22 'Action of some braid groups on Hodge Algebras' Communications in Algebra. volume 26, (1998) 1233-1242.

23 'Weak Cayley Table Groups,' Journal of Algebra volume 216 (1999) 135-158.

24 'Braid groups, infinite Lie algebras of Cartan type and rings of invariants', Topology and its Applications volume 95 (1999) 173-205 .

25 'Some Linear Representations of Braid Groups,' Journal of Knot Theory and its Ramifications, volume 9 (3) (2000) 341-366.

26 'Torsion-free quotients of braid groups,' Internat. Jour. Alg. and Comp. (2001)

27 'Intersection number operators for curves on discs and Chebychev Polynomials,' Knots, Braids and Mapping Class Groups (2001) pages 49-75.

28 'Intersection number operators for curves on discs II,' Geometriae Dedicata. Volume 86, (2001), 153-168.

29 'Action of braid groups on determinantal ideals, compact spaces and a stratification of Teichmuller space' Inventiones Mathematicae, volume 144 (2001) 451-505.

30 'Hurwitz action on sequences of Euclidean reflections', J. Algebra. Volume 269 (2003) 556-588.

31 'Hurwitz action on Artin groups' Israel Math J. vol 143 (2004) 189-222

32 (with C. Krattenthaler) "Trace identities from identities for determinants" Linear Algebra Appl. volume 411 (2005) 328-342.

33 'Braid groups and Aut(F2) are not rigid' Contemp Math 360, 51-54 (2005)

34. "An action of subgroups of Mapping Class Groups on polynomial Algebras". Top and its applications 154 (2007), no. 6, 1053--1083

35 (with Robert Bradshaw) "Randomized Methods in Artin groups of finite type" Int J. Alg and Comp 17 (2007), no. 4, 859--868.

36 'Representations and rigidity of Aut(F3)' Int J Alg Comp, volume 16, (2006), no. 5, 925--929.

37 (with Anthony Manning) "Curves of fixed points of trace maps" Ergodic Theory Dynam. Systems 27 (2007), no. 4, 1167--1198.

38 (with Ken Johnson) 'Fusion of abelian groups' Fusions of character tables and Schur rings of abelian groups. Comm. Algebra, volume 36, (2008), no. 4, 1437--1460.

39 'Intersection-number operators and Chebyshev polynomials. IV. Non-planar cases.' Geom. Dedicata, volume 130 (2007).

40 'Subgroups of pure braid groups generated by powers of Dehn twists.' Rocky Mountain J. Math., volume 37 (2007), no. 3, 801--828.

41 (with Chris Cornwell) "Counting fundamental paths in certain Garside semigroups" J. Knot theory and its ramifications, volume 17, (2008), no. 2, 191--211.

42. (with Zane Li.) `Counting Powers of words in monoids' European Journal of Combinatorics Volume 30 (2009) pages 1297-1308

43 `Intersection theories and Chebyshev polynomials III', J. of Algebra and its Applications Volume 8 Number 1, (2009), pages 53-81.

44. (with K.W. Johnson) `Fusions of character tables II: p-groups' Commun. In Algebra, Volume 37, 4296-4315 (2009).

45. 'Finite index subgroups of free groups and braid groups generated by conjugates of powers of the generators' J. of Group theory, Volume 12 Number 3 (2009), pages 465-485.

46. (with Shao, Changguo; You, Xingzhong; Zhang, Jinshan) ` A note on ``Conjugacy classes outside a normal subgroup" ' Commun. In Algebra , Volume 37, page 3306-3308, (2009).

47. (with K. W. Johnson and Brent Kerby) 'Fusions of character tables III: fusions of cyclic groups and a generalization of a condition of Camina' Israel J. of Math. Volume 178, pages 325-348 (2010).

48. (with Emma Rode) 'Weak Cayley Tables and generalized Centralizer rings of Finite Groups' Mathematical Proceeding of the Cambridge Philosophical Society, Volume 153 pp. 281-318 (2012).

49. (with Dane Skabelund) `Character tables of metacyclic groups' Glasgow Journal of mathematics, vol 57 (2015) no 2 387-400.

50. (with Anthony Manning) ` Curves of period two points for trace maps' Trans. Amer, Math. Soc. vol 367 (2015) 5721-5751.

51. (with Emma Rode) 'A class of groups determined by their 3-S-ring' Rocky Mountain J Math (2015) vol 45, pp 565-581.

52. `Commutative Schur rings over Symmetric groups' J Algebraic Combinatorics vol 42 (2015) pp. 971-997.

53. (with Emma Rode and Chelsea Kennedy) 'The total character of a finite group.' Algebra Colloquium, vol 22 (2015) pp. 775-788.

54. (with Long Nguyen) Weak Cayley Table groups II: alternating groups and Coxeter groups Commun. Algebra (2015) vol 43 no 11 pp. 4763-4782.

55 (with K Johnson A Misseldine) `Commutative Schur rings of maximal dimension' Commun. Algebra vol 43 (2015) no 12, pp 5298-5327.

56. (with Amanda Francis) ` Commutative Schur-rings over symmetric groups II: the case n=6' Algebraic Comb and Discrete structures (2016) vol 3, no 2 pp 61-80.

57. (with Long Nguyen) `Weak Cayley Table groups III: PSL(2,q)' Commun. Algebra vol 45, no 7, (2017) pp 3110--3136.

58. (With David Wagner) "Central Schur rings over the projective special linear groups." Comm. Algebra 45 (2017) no. 12. pp. 5325–5337.

59. (with Paulsen, Rebeca A.) 'Weak Cayley table groups of some crystallographic groups.' Glasg. Math. J. 60 (2018), no. 3, 635–660.

60 'Generalised cogrowth series, random walks, and the group determinant.' Math. Proc. Cambridge Philos. Soc. 165 (2018), no. 3, 445–465.

61 Hoagland, Courtney; Humphries, Stephen P.; Nicholson, Nathan; Poulsen, Seth Difference sets disjoint from a subgroup. *Graphs Combin.* 35 (2019), no. 3, 579–597.

62 Bastian, Nicholas; Brewer, Jaden; Humphries, Stephen; Misseldine, Andrew; Thompson, Cache On Schur rings over infinite groups. *Algebr. Represent. Theory* 23 (2020), no. 3, 493–511.

63 Schur rings over infinite groups II. *J. Algebra* 550 (2020), 309–332.

64 Miles A. Clemens, Branton J. Campbell and Stephen P. Humphries 'Normally supportive sublattices of crystallographic space groups' Acta Cryst. (2019) https://doi.org/10.1107/S205327331901218X

65 Humphries, Stephen P.; Nicholson, Nathan L. Difference sets disjoint from a subgroup II: Groups of order $4p^2$. *Graphs Combin.* 37 (2021), no. 6, 2333–2349.

66 Anderson, Gradin; Humphries, Stephen P.; Nicholson, Nathan Strong Gelfand pairs of symmetric groups. *J. Algebra Appl.* 20 (2021), no. 4, Paper No. 2150054, 22 pp.

67 Andrea Barton, Stephen P. Humphries "Strong Gelfand pairs of SL(2,p)", Journal of Algebra and its applications, (2022) DOI: https://www.worldscientific.com/doi/10.1142/S0219498823501335

LIST OF SOME PROFESSIONAL TALKS GIVEN

University of Sussex Low Dimensional Topology conference, 1977
British Math Conference, Bristol 1984
Oxford University Colloquium, 1983
Southamptom University Colloquium, 1983
Cardiff University Colloquium, 1983
SUNY at Binghampton Colloquium, 1984
Lehigh University Colloquium, 1984
Colloquia, BYU 1984, 1987, 2005
Southern California Topology Seminar, 1986
MAA meeting at BYU, 198?
AMS meeting at Logan, Ut 1986
Mal'cev Algebra Conference, Novosibirsk 1989
Colloquia at University of Wales, Bangor 1989, 1993, 1997, 1998, 2001
Groups St. Andrews at Galway, July 1993
Beijing Group theory meeting, May 1996
Canadian Math. Soc. meeting 1997
Sarasota Group theory meeting, Jan. 1997
Groups St. Andrews at Bath, July 1997
Cascade Topology Seminar, Nov. 1997
Birmanfest NYC 1998
Heriot-Watt July 1998
AMS Meeting at Las Vegas Apr. 1999
AMS Meeting at New York Nov. 2000
Southern England topology conference London Nov 2001
Colloquium at the Univ. of Southampton Fall 2001
Topology seminar at Warwick Univ. Nov. 2001
Cannonfest June 2003

Colloquium at the Univ. College Dublin Fall 2004
Conference on Braid groups at Banff Math center March 2007. BYU
BYU Colloquia 2009 and 2012.
 Group theory Conference (England, 2011).
 Groups St Andrews, St Andrews, Scotland, 2013.
 Slovenia Group theory conference 2014.
 Groups St Andrews, Birmingham, England, 2017.
 Conference on Algebraic Graph theory, Symmetry and Regularity', Pilsen, Czech
Republic, 2018
 Algebraic Combinatorics Conference, Bled Slovenia Summer 2019
 Madison Wisconsin AMS meeting Sept 2019
 Groups St Andrews at Newcastle July 2022

Ph. D. STUDENTS SUPERVISED

1. Dmitri Kouksov (alt. Kuksov): 'Cogrowth of groups' Ph. D. thesis (1998). From this
thesis two papers have appeared:
 1) On rationality of the cogrowth series.Proc. Amer. Math. Soc. 126 (1998), no. 10,
2845--2847.
 2) Cogrowth series of free products of finite and free groups. Glasg. Math. J. 41 (1999),
no. 1, 19--31.

2. Emma Turner 'k-S-Rings' Ph D. thesis (2012)

3. Long Nguyen 'Weak Cayley Table Isomorphisms' Ph. D. thesis (2012).

4. Andrew Misseldine 'Algebraic and Combinatorial Properties of Schur rings over
Cyclic groups' Ph. D. thesis (2014).

5. Rebeca Paulsen, "Weak Cayley Table maps of Crystallographic groups" Ph.D.
thesis (2021)

Each of 2,3,4 above produced at least one paper from their thesis.

CURRENT STUDENTS

(Doctorate Degree)

(Masters Degree)

Andrew Haviland, Joseph Marrow

Contact information

   Department of Mathematics,
    Brigham Young University, Provo, UT 84602
    Phone: (801) 422 3370

e-mail: steve@mathematics.byu.edu

Other Contributions and Awards

In 2005 I was the recipient of the BYU Math Department Distinguished teaching (Savage Family) award ($1000).

Math department research award 2007

Math department research award 2014.

Math department mentoring award 2012.

Reviewer for Math Sci Net (math reviews) and referee for a number of good journals.

MEG grant ($14000) (2006-2009)

Mentoring grant award for 2010-2011 ($5000)

MEG grant (2016-2019) $17000

Honors thesis students supervised

Maria Nemirovskaya: "A combinatorial approach to the computation of the Jones invariant for torus links" (1996)

David Walton "Decomposing the regular representation of dihedral groups" (1996)

Chelsea Johnson (2011) "The total Character of a finite group". Chelsea was the Student Speaker at the August 2011 Graduation.

Undergraduates supervised (mentored research)

Chris Cornwell "Counting fundamental words in braid groups" (2003) " (paper appeared)
Robert Bradford "Conjugacy algorithms in Artin groups" (paper appeared) (2004)
Holly Freedman "Braid groups" (1994)
Sara Smoot (2002). Rebecca Dorff (2009)
Nathan Perry, Kayla Owen (2006)
Chelsea Johnson (paper appeared) and Dane Skabelund (2010)
Bruce Chiarelli (2013)
Travis Alvarez (2014)
David Wagner (2014) (paper appeared)
Seth Poulson,
Courtney Hoaglund (2017) (paper submitted).
Josh Basden, (2017 and 2018)
John Garrett, (2017 and 2018)
Nathan Nicholson, (2017 and 2018)
Joseph Leung, (2017 and 2018)
Cache Thompson (2017 and 2018)
Grady Anderson (2018,2021-2022)
Bonnie Magland (2020-22)
Mckay Holmes (2020-21)
Andrea Barton (2020-21)

Andrew Haviland (2022)
Zach Higginson (2022)
Jordan Gardiner (2022)

High school students supervised

Yewon Gim and Yaeyoung Kim "The pennies problem" (2003) Timpview HS

Zane Li "Counting powers of fundamental words in monoids". (2008) resulted in a published paper (number 42 above).

Masters Degree theses and projects

I have supervised the following students for their Masters thesis/project:

David Brown,
David Carlson.
Nathan Perry.
Brent Kerby.
Jan MacDonald.
Liz Jones.
Long Nguyen.
John Vogler.
Maria Nemirovskaya.
Tom Draper.
Ivan Andrus.
King Fai Pang.
Christopher Cornwell.
Jeremy Magland.
Tina Chappel.
Alan Dickson.
Danae Romrell,
Melissa Mitchell.
Chelsea Johnson.
Dane Skabelund.
Joseph Keller.
Randall Reese.
Rebeca Paulsen.
David Wagner.
Kevin Johnston.
Cache Thonpson.
Nicholas Bastian
AndrewHaviland
Joseph Marrow