

# Curriculum Vitae <sup>1</sup>

## Egon Schulte

*Department of Mathematics  
Northeastern University  
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### Education

Habilitation in Mathematics, University of Dortmund, Germany, 1985.

*Habilitationsschrift:*

*Monotypische Pflasterungen und Komplexe (Monotypic Tilings and Complexes).*

Doctor of Natural Sciences (in Mathematics), University of Dortmund, 1980.

*Doctoral Dissertation: Reguläre Inzidenzkomplexe (Regular Incidence Complexes).*

*Advisor: Ludwig Danzer.*

Diplom in Mathematics, University of Dortmund, 1978.

Attended University of Dortmund in Fall 1973.

### Positions

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| since 7/1992  | Professor of Mathematics at Northeastern University, Boston (tenured since 7/1993). |
| 9/1998–6/2001 | Acting Chair, Mathematics Department, Northeastern University.                      |
| 1989–1992     | Associate Professor at Northeastern University.                                     |
| 1987–1989     | Assistant Professor (visiting) at M.I.T., Cambridge.                                |
| 1985–1987     | Privatdozent at University of Dortmund.   |
| 1984–1985     | Wissenschaftlicher Assistent at University of Dortmund.                             |
| 1983–1984     | Assistant Professor (visiting) at University of Washington, Seattle.                |
| 1978–1983     | Wissenschaftlicher Assistent at University of Dortmund.                             |

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<sup>1</sup>November 7, 2017

## List of Publications

### Book

- *Abstract Regular Polytopes* (with P.McMullen). Encyclopedia of Mathematics and its Applications, Volume 92, Cambridge University Press (Cambridge – New York, 2002), 566 pp.

### Articles

1. Ree groups in characteristic 3 acting on polytopes (with D.Leemans and H. Van Maldeghem). *Ars Mathematica Contemporanea* 14 (2018) 209–226.
2. Regular incidence complexes, polytopes, and C-groups. In: *Discrete Geometry and Symmetry*, In Honor of Károly Bezdek’s and Egon Schulte’s 60th Birthdays, Marston D.E. Conder, Antoine Deza and Asia Ivić Weiss (eds.), Springer, 23 pp, to appear in 2018.
3. Skeletal geometric complexes and their symmetries (with A.Ivić Weiss). *Mathematical Intelligencer* 39 (2017), 5–16.
4. Polyhedral maps (with U.Brehm). Chapter in *Handbook of Discrete and Computational Geometry, Third Edition* (eds. J.E.Goodman, J.O’Rourke and C.Toth), Chapman & Hall/CRC (Boca Raton, 2017, to appear).
5. Symmetry of polytopes and polyhedra. Chapter in *Handbook of Discrete and Computational Geometry, Third Edition* (eds. J.E.Goodman, J.O’Rourke and C.Toth), Chapman & Hall/CRC (Boca Raton, 2017, to appear).
6. Wythoffian skeletal polyhedra in ordinary space, I (with A.Williams). *Discrete & Computational Geometry* 56 (2016), 657–692.
7. Polytopes with preassigned automorphism groups (with G.I.Williams). *Discrete & Computational Geometry* 54 (2015), 444–458.
8. Cube-like incidence complexes and their groups (with A.C.Duke). *Proceedings of the Steklov Institute of Mathematics* 288 (2015), 226–242.
9. Colorful associahedra and cyclohedra (with G.Araujo-Prado, I.Hubard, D.Oliveros). *Journal Combinatorial Theory A* 129 (2015), 122–141.
10. Polyhedra, complexes, nets and symmetry. *Acta Crystallographica Section A* 70 (2014), 203–216.
11. Finite polytopes have finite regular covers (with B.Monson). *Journal of Algebraic Combinatorics* 40 (2014), 75–82.

12. The regular Grünbaum polyhedron of genus 5 (with G.Gevay and J.M.Wills). *Advances in Geometry* 14 (2014), 465–482.
13. Polygonal complexes and graphs for crystallographic groups (with D.Pellicer), In *Symmetry and Rigidity*, (eds. R.Connelly, A.Ivić Weiss and W.Whiteley), Fields Institute Communications, Vol. 20, Springer (New York, 2014), 325–344.
14. Hereditary polytopes (with M.Mixer and A.Ivić Weiss). In *Symmetry and Rigidity*, (eds. R.Connelly, A.Ivić Weiss and W.Whiteley), Fields Institute Communications, Vol. 20, Springer (New York, 2014), 279–302.
15. Regular Polygonal Complexes of Higher Ranks in  $\mathbb{E}^3$ . *Model. Anal. Inform. Sist.* 20 (2013), 103–110.
16. Icosahedral skeletal polyhedra realizing Petrie relatives of Gordan’s regular map (with A.M.Cutler and J.M.Wills). *Contributions to Algebra and Geometry* 54 (2013), 651–657.
17. Colorful polytopes and graphs (with G.Araujo-Pardo, I.Hubard and D.Oliveros). *Israel Journal of Mathematics* 195 (2013), 647–675.
18. Combinatorial prototiles. In *Shaping Space (Exploring Polyhedra in Nature, Art, and the Geometrical Imagination)*, (ed. M.Senechal), Springer, 2013, pp. 217–222.
19. Regular polygonal complexes in space, II (with D.Pellicer). *Transactions American Mathematical Society* 365 (2013), 2031–2061.
20. Cube-like polytopes and complexes (with A.Duke). In *Mathematics of Distances and Applications*, (eds. M.Deza, M.Petitjean and K.Markov), ITHEA – Publisher (Sofia, Bulgaria, 2012), 54–65.
21. Symmetric graphicahedra (with M.Del Río-Francos, I.Hubard and D.Oliveros). *Ars Mathematica Contemporanea* 5 (2012) 383–405.
22. Semiregular polytopes and amalgamated C-groups (with B.Monson). *Advances in Mathematics* 229 (2012), 2767–2791.
23. Convex-faced combinatorially regular polyhedra of small genus (with J.M.Wills). *Symmetry* 4 (2012), 1–14.
24. Symmetric graphs from abstract polytopes of high rank (with M.Mixer). *Graphs and Combinatorics* 28 (2012), 843–857.
25. On the size of equifaceted semi-regular polytopes (with T.Pisanski and A.I.Weiss). *Glasnik Matematički* 47 (2012), 421–430.
26. Constructions of chiral polytopes of small rank (with A.Breda D’Azevedo and G.A.Jones). *Canadian Journal of Mathematics* 63 (2011), 1254–1283.

27. Regular polyhedra of index two, I (with A.M.Cutler). *Contributions to Algebra and Geometry* 52 (2011), 133–161.
28. Combinatorial space tiling. *Symmetry: Culture and Science* 22 (2011), 477–491.
29. The graphicahedron (with G.Araujo-Pardo, M.Del Río-Francos, M.López-Dudet and D.Oliveros). *European Journal of Combinatorics* 31 (2010), 1868–1879.
30. Regular polygonal complexes in space, I (with D.Pellicer). *Transactions American Mathematical Society* 362 (2010), 6679–6714.
31. Locally toroidal polytopes and modular linear groups (with B.Monson). *Discrete Mathematics* 310 (2010), 1759–1771.
32. Polytopes with groups of type  $PGL_2(q)$  (with D.Leemans). *Ars Mathematica Contemporanea* 2 (2009), 163–171.
33. A local characterization of combinatorial multihedrality in tilings (with N.Dolbilin). *Contributions to Discrete Mathematics* 4 (2009), 1–11.
34. Modular reduction in abstract polytopes (with B.Monson). *Canadian Mathematical Bulletin* 52 (3) (2009), 435–450.
35. Reflection groups and polytopes over finite fields, III (with B.Monson). *Advances in Applied Mathematics* 41 (2008), 76–94.
36. Groups of type  $L_2(q)$  acting on polytopes (with D.Leemans). *Advances in Geometry* 7 (2007), 529–539.
37. Semisymmetric graphs from polytopes (with B.Monson, T.Pisanski and A.I.Weiss). *J. Combinatorial Theory, Series A*, 114 (2007), 421–435.
38. Reflection groups and polytopes over finite fields, II (with B.Monson). *Advances in Applied Mathematics* 38 (2007), 327–356.
39. Petrie-Coxeter maps revisited (with I.Hubard and A.I.Weiss). *Contributions to Algebra and Geometry* 47 (2006), 329–343.
40. Problems on polytopes, their groups, and realizations (with A.I.Weiss). *Periodica Mathematica Hungarica*, (Special Issue on Discrete Geometry) 53 (2006), 231–255.
41. Regular and chiral polytopes in low dimensions (with P.McMullen). In *The Coxeter Legacy – Reflections and Projections* (eds. C.Davis and E.W.Ellers), Fields Institute Communications, Volume 48, American Mathematical Society (Providence, RI, 2006), 87–106.
42. Chiral polyhedra in ordinary space, II. *Discrete & Computational Geometry* 34 (2005), 181–229.
43. The Local Theorem for Monotypic Tilings (with N.Dolbilin). *Electronic Journal of Combinatorics* 11(2) (2004/5), #R7 (19 pp).

44. Reflection Groups and Polytopes over Finite Fields, I (with B.Monson). *Advances in Applied Mathematics* 33 (2004), 290–317.
45. Chiral polyhedra in ordinary space, I. *Discrete & Computational Geometry* 32 (2004), 55–99.
46. Polyhedral maps (with U.Brehm). Chapter in *Handbook of Discrete and Computational Geometry, Second Edition* (eds. J.E.Goodman and J.O'Rourke), Chapman & Hall/CRC (Boca Raton, 2004), 477–491.
47. Symmetry of polytopes and polyhedra. Chapter in *Handbook of Discrete and Computational Geometry, Second Edition* (eds. J.E.Goodman and J.O'Rourke), Chapman & Hall/CRC (Boca Raton, 2004), 431–454.
48. Combinatorial aperiodicity of polyhedral prototiles. In *Discrete Geometry: In Honor of W.Kuperberg's 60<sup>th</sup> Birthday* (ed. A.Bezdek), Marcel Dekker Inc. (New York, 2003), 397–406.
49. Locally unitary groups and regular polytopes (with P.McMullen). *Advances in Applied Mathematics* 29 (2002), 1–45.
50. The mix of a regular polytope with a face (with P.McMullen). *Annals of Combinatorics* 6 (2002), 77–86.
51. Tilings. Chapter in *Encyclopedia of Physical Science and Technology, Third Edition*, Volume 16, Academic Press (San Diego, 2001), 763–782.
52. Symmetric tessellations on euclidean space-forms (with M.Hartley and P.McMullen). *Canadian Journal of Mathematics* 51 (1999), 1230–1239.
53. Flat regular polytopes (with P.McMullen). *Annals of Combinatorics* 1 (1997), 261–278.
54. On prismatic tiles (with A.I.Weiss). *Acta Mathematica Hungarica* 76 (1997), 101–107.
55. Symmetry of polytopes and polyhedra. Chapter in *Handbook of Discrete and Computational Geometry* (eds. J.E.Goodman and J.O'Rourke), CRC Press (Boca Raton, 1997), 311–330.
56. Polyhedral maps (with U.Brehm). Chapter in *Handbook of Discrete and Computational Geometry* (eds. J.E.Goodman and J.O'Rourke), CRC Press (Boca Raton, 1997), 345–358.
57. Regular polytopes in ordinary space (with P.McMullen). *Discrete & Computational Geometry* 17 (1997), 449–478.
58. Twisted groups and locally toroidal regular polytopes (with P.McMullen). *Transactions American Mathematical Society* 348 (1996), 1373–1410.

59. Higher toroidal regular polytopes (with P.McMullen). *Advances in Mathematics* 117 (1996), 17–51.
60. Manifold structures on abstract regular polytopes (with U.Brehm and W.Kühnel). *Aequationes Mathematicae* 49 (1995), 12–35.
61. Chiral polytopes from hyperbolic honeycombs (with B.Nostrand). *Discrete & Computational Geometry* 13 (1995), 17–39.
62. Free extensions of chiral polytopes (with A.I.Weiss). *Canadian Journal of Mathematics* 47 (3) (1995), 641–654.
63. Classification of locally toroidal regular polytopes. In *NATO Advanced Study Institute on Polytopes – Abstract, Computational and Convex* (eds. T.Bisztriczky, P.McMullen, R.Schneider and A.Ivić Weiss), Kluwer (Dordrecht, 1994), 125–154.
64. Space-fillers of higher genus. *Journal Combinatorial Theory A* 68 (1994), 438–453.
65. Quotients of polytopes and C-groups (with P.McMullen). *Discrete & Computational Geometry* 11 (1994), 453–464.
66. Chirality and projective linear groups (with A.I.Weiss). *Discrete Mathematics* 131 (1994), 221–261.
67. Constructions of chiral polytopes (with B.Nostrand and A.I.Weiss). *Congressus Numerantium* 97 (1993), 165–170.
68. Tilings. Chapter in *Handbook of Convex Geometry* (eds. J.M.Wills and P.Gruber), Elsevier Science Publishers (Amsterdam, 1993), 899–932.
69. Locally toroidal regular polytopes of rank 4 (with P.McMullen). *Commentarii Mathematici Helvetici* 67 (1992), 77–118.
70. Regular polytopes of type  $\{4, 4, 3\}$  and  $\{4, 4, 4\}$  (with P.McMullen). *Combinatorica* 12 (2) (1992), 203–220.
71. Finite quotients of infinite universal polytopes (with P.McMullen). In *Discrete and Computational Geometry* (eds. J.Goodman, R.Pollack and W.Steiger), DIMACS Series in Discrete Mathematics and Theoretical Computer Science, Volume 6, American Mathematical Society & Association Computing Machinery (1991), 231–236.
72. Chiral polytopes (with A.I.Weiss). In *Applied Geometry and Discrete Mathematics – The Victor Klee Festschrift* (eds. P.Gritzmann and B.Sturmfels), DIMACS Series in Discrete Mathematics and Theoretical Computer Science, Volume 4, American Mathematical Society & Association Computing Machinery (1991), 493–516.
73. Combinatorially regular polyhedra in three-space (with J.M.Wills). In *Symmetry of Discrete Mathematical Structures and Their Symmetry Groups* (eds. K.H.Hofmann and R.Wille), Research and Exposition in Mathematics, Volume 15, Heldermann-Verlag (Berlin, 1991), 49–88.

74. Hermitian forms and locally toroidal regular polytopes (with P.McMullen). *Advances in Mathematics* 82 (1990), 88–125.
75. Regular polytopes from twisted Coxeter groups and unitary reflexion groups (with P.McMullen). *Advances in Mathematics* 82 (1990), 35–87.
76. On a class of abstract polytopes constructed from binary codes. *Discrete Mathematics* 84 (1990), 295–301.
77. Constructions of regular polytopes (with P.McMullen). *Journal Combinatorial Theory A* 53 (1990), 1–28.
78. Regular polytopes from twisted Coxeter groups (with P.McMullen). *Mathematische Zeitschrift* 201 (1989), 209–226.
79. Generating combinatorial complexes of polyhedral type. *Transactions American Mathematical Society* 309 (1988), 35–50.
80. Amalgamation of regular incidence-polytopes. *Proceedings London Mathematical Society* (3) 56 (1988), 303–328.
81. Infinite series of combinatorially regular polyhedra in three-space (with P.McMullen and J.M.Wills). *Geometriae Dedicata* 26 (1988), 299–307.
82. Combinatorial prototiles. In *Shaping space – A polyhedral approach* (eds. G.Fleck and M.Senechal), Birkhäuser (Boston, 1988), 198–204.
83. On a theorem of McMullen about combinatorially regular polytopes (with A.W.M. Dress). *Simon Stevin* 61 (1987), 265–273.
84. Kepler-Poinsot-type realizations of regular maps of Klein, Fricke, Gordan and Sherk (with J.M.Wills). *Canadian Mathematical Bulletin* 30 (2), 1987, 155–164.
85. Self-dual regular polytopes and their Petrie-Coxeter-polyhedra (with P.McMullen). *Results in Mathematics* 12 (1987), 366–375.
86. Polyedrische Realisierung regulärer Karten (with J.M.Wills). *Bayreuther Mathematische Schriften* 21 (1986), 320–327.
87. Geometric realizations for Dyck’s regular map on a surface of genus 3 (with J.M.Wills). *Discrete & Computational Geometry* 1 (1986), 141–153.
88. On Coxeter’s regular skew polyhedra (with J.M.Wills). *Discrete Mathematics* 60 (1986), 253–262.
89. Äquivalenz und reguläre Polyeder (with J.M.Wills). In *Proceedings Third Colloquium on Discrete Geometry, Salzburg 1985* (ed. A.Florian), 301–317.
90. Analogues of Steinitz’s theorem about non-inscribable polytopes. *Colloquia Mathematica Societatis János Bolyai* 48 (1985), 503–516.

91. A polyhedral realization of Felix Klein's map  $\{3, 7\}_8$  on a Riemann surface of genus 3 (with J.M.Wills). *Journal London Mathematical Society* (2) 32 (1985), 539–547.
92. Extensions of regular complexes. In *Finite Geometries* (eds. C.A.Baker and L.M.Batten), Lecture Notes Pure Applied Mathematics No. 103, Marcel Dekker (New York, 1985), 289–305.
93. Regular incidence-polytopes with Euclidean or toroidal faces and vertex-figures. *Journal Combinatorial Theory A* 40 (1985), 305–330.
94. The existence of nontiles and nonfacets in three dimensions. *Journal Combinatorial Theory A* 38 (1985), 75–81.
95. Nontiles and nonfacets for Euclidean space, spherical complexes and convex polytopes. *Journal Reine Angewandte Mathematik* 352 (1984), 161–183.
96. Tiling three-space by combinatorially equivalent convex polytopes. *Proceedings London Mathematical Society* (3) 49 (1984), 128–140.
97. Pflasterungen des Raumes mit Pyramiden und Doppelpyramiden. *Elemente der Mathematik* 39 (1984), 113–117.
98. Preassigning the shape for bodies of constant width (with S.Vrecica). *Monatshefte für Mathematik* 96 (1983), 157–164.
99. On arranging regular incidence-complexes as faces of higher-dimensional ones. *European Journal of Combinatorics* 4 (1983), 375–384.
100. Reguläre Inzidenzkomplexe III. *Geometriae Dedicata* 14 (1983), 57–79.
101. Reguläre Inzidenzkomplexe II. *Geometriae Dedicata* 14 (1983), 33–56.
102. Reguläre Inzidenzkomplexe I (with L.Danzer). *Geometriae Dedicata* 13 (1982), 295–308.
103. Konstruktion regulärer Hüllen konstanter Breite. *Monatshefte für Mathematik* 92 (1981), 313–322.
104. Reguläre Inzidenzkomplexe. In *Proceedings Second Colloquium on Discrete Geometry, Salzburg 1980* (ed. A.Florian), 196–206.

## Theses

- *Monotypische Pflasterungen und Komplexe*. Habilitationsschrift, University of Dortmund, Germany, 1985.
- *Reguläre Inzidenzkomplexe*. Doctoral Dissertation, University of Dortmund, Germany, 1980.



## Edited Works

- *Symmetry*. Special Issue on Polyhedral Structures (2016-2017). In preparation.
- *Symmetry*. Guest Editor. Special Issue on Polyhedra. Ten articles published in *Symmetry* 4 (2012) and 5 (2013), 190 pp.
- *Symmetry: Culture and Science* 22 (2011), 273–496. Guest Editor (with M.Deza), Special Issue on Tessellations, Part II.
- *Symmetry: Culture and Science* 22 (2011), 1–272. Guest Editor (with M.Deza), Special Issue on Tessellations, Part I.
- *European Journal of Combinatorics* 29 (2008), 1801–1958. Guest Editor (with N.Dolbilin), Special Issue in Honor of Ludwig Danzer’s 80-th Birthday.
- *Discrete Mathematics* 221 (2000), 1–156. Guest Editor (with M.Senechal), Special Issue in Honor of Ludwig Danzer’s 70-th Birthday.

## Editorial Boards

- The Art of Discrete and Applied Mathematics, Associate Editor (since 2017).
- *Symmetry* (since 2014).
- International Scholarly Research Notices (ISRN) (since 2014).
- *Symmetry: Culture and Science* (since 2013).
- Chinese Journal of Mathematics (since 2013).
- *Ars Mathematica Contemporanea* (since 2007).
- Contributions to Discrete Mathematics (since 2005).
- The Scientific World Journal (2013–2016).
- ISRN Geometry (2011–2014).

## Ph.D. Students

- Nicholas Matteo, Ph.D. in 2015 at Northeastern University, Ph.D. Thesis on *Convex Polytopes and Tilings with Few Flag Orbits*.
- Abigail Dalton-Williams, Ph.D. in 2015 at Northeastern University, Ph.D. Thesis on *Wythoffian Skeletal Polyhedra*.
- Ilya Scheidwasser, Ph.D. in 2015 at Northeastern University, Ph.D. Thesis on *Contractions of Polygons in Abstract Polytopes*.
- Undine Leopold, Ph.D. in 2014 at Northeastern University, Ph.D. Thesis on *Vertex-Transitive Polyhedra in Three-Space*.
- Andrew Duke, Ph.D. in 2014 at Northeastern University, Ph.D. Thesis on *Cube-like Regular Incidence Complexes*.
- Ilanit Helfand, Ph.D. in 2013 at Northeastern University, Ph.D. Thesis on *Constructions of  $k$ -Orbit Abstract Polytopes*.
- Gabriel Cunningham, Ph.D. in 2012 at Northeastern University, Ph.D. Thesis on *Internal and External Invariance of Abstract Polytopes*.
- Mark Mixer, Ph.D. in 2010 at Northeastern University, Ph.D. Thesis entitled *Transitivity of Graphs Associated with Highly Symmetric Polytopes*.
- Anthony Cutler, Ph.D. in 2009 at Northeastern University, Ph.D. Thesis on *Regular polyhedra of Index 2*.
- Daniel Pellicer-Covarrubias, Ph.D. in 2007 at Universidad Nacional Autónoma de México, Ph.D. Thesis on *CPR Graphs and Abstract Regular Polytopes*, External Co-Advisor, jointly with J.Bracho of Instituto de Matemáticas, UNAM.
- Sergey Bratus, Ph.D. in 1999 at Northeastern University, Ph.D. Thesis on *Recognition of Finite Black Box Groups*, Co-Advisor, jointly with L.Finkelstein and G.Cooperman, College of Computer Science, Northeastern University.
- Barbara Nostrand, Ph.D. in 1993 at Northeastern University, Ph.D. Thesis on *Chiral Honeycombs*.