

CURRICULUM VITAE OF ANDREW G. EARNEST

I. PROFESSIONAL AFFILIATION AND CONTACT INFORMATION

- A. Present University Department: Mathematics
- B. Office Address: Neckers 365 (aearnest@math.siu.edu)

II. EDUCATION

- Ph.D. Ohio State University, Columbus, Ohio 1975
- M.S. Ohio State University, Columbus, Ohio 1972
- B.S. Elizabethtown College, Elizabethtown, Pennsylvania 1970

III. PROFESSIONAL EXPERIENCE

- 1997-present Chair, Department of Mathematics, Southern Illinois University Carbondale
- 1994-1995 Program Director for Algebra and Number Theory, National Science Foundation
- 1991-present Professor, Southern Illinois University Carbondale
- 1983-1991 Associate Professor, Southern Illinois University Carbondale
- 1981-1983 Assistant Professor, Southern Illinois University Carbondale
- 1976-1981 Assistant Professor, University of Southern California
- 1976 Lecturer, Ohio State University
- 1974-1975 Teaching Associate, Ohio State University
- 1970-1974 National Science Foundation Trainee, Ohio State University

IV. RESEARCH AND CREATIVE ACTIVITY

- A. Interests and Specialties:
 - 1. Algebra and Algebraic Number Theory
 - 2. Specialty: Arithmetic Theory of Quadratic Forms
- B. Current Projects:
 - 1. Study of representation properties of integral quadratic forms
 - 2. Generation of orthogonal and unitary groups
- D. Grants Received:
 - 1. SIUC Summer Research Fellowship award for project entitled Binary Quadratic Forms over Algebraic Number Fields; effective dates 6/15/86-7/15/86.
 - 2. National Security Agency research grant #MDA904-90-H-1016 for project, "Representation properties of quadratic lattices"; effective dates 6/1/90 - 5/31/92; award amount \$35,112.
 - 3. National Security Agency research grant #MDA904-92-H-3051 for project "Integral quadratic forms and lattices;" effective dates 5/18/92 -5/17/94; award amount \$22,600.

- E. Honors and Awards
1. American Men and Women of Science
 2. Outstanding Alumnus Award, Elizabethtown College Department of Mathematical Sciences, 1994
- F. Papers and Presentations at Professional Meetings (selected invited lectures only):
1. Capitulation of spinor genera of integral quadratic forms in quadratic extensions of \mathbb{Q} , Special Session on Number Theory, A.M.S., San Antonio, Jan. 22, 1976.
 2. Quadratic lattices under scalar extension, Southern California Number Theory Conference, Irvine, Jan. 20, 1977.
 3. Structure of genera of binary quadratic lattices, Special Session on Quadratic Forms, A.M.S., Columbus, March 24, 1978.
 4. One-class spinor genera of definite quadratic forms, Special Session on Quadratic Forms, A.M.S., Honolulu, March 31, 1979.
 5. Exceptional integers of a genus of ternary quadratic forms, Special Session on Quadratic Forms, A.M.S., San Francisco, Jan. 8, 1981.
 6. Local-global theorems for integral quadratic forms, Southern California Algebra Conference, Los Angeles, March 28, 1981.
 7. Growth of class numbers of binary quadratic forms, Special Session on Quadratic Forms, A.M.S., Cincinnati, Jan. 17, 1982.
 8. Ideal class groups of 2-power exponent, Special Conference in Honor of Professor Hans Zassenhaus, Columbus, June 17, 1982.
 9. Ideal class groups of 2-power exponent, Special Session on Number Theory, A.M.S., Toronto, Aug. 24, 1982.
 10. Pythagorean triples a thousand years before Pythagoras, Illinois Council of Teachers of Mathematics, 38th annual meeting, Champaign, Oct. 31, 1986. Repeated Oct. 24, 1987.
 11. Integral quadratic forms whose class and spinor genus coincide, Special Session on Quadratic Forms and Real Algebraic Geometry, A.M.S., Chicago, May 19, 1989.
 12. Short-term visitor at the Mathematical Research Institute, Ohio State University, July 30-Aug. 10, 1990. Gave talks "Some representation properties of integral quadratic forms," (July 31) and "Genera of rationally equivalent binary quadratic forms," (Aug. 7).
 13. Distribution of genera of integral quadratic forms among rational classes, Special Session on Quadratic Forms, A.M.S., Santa Barbara, Nov. 9, 1991.
 14. Integers primitively represented by certain ternary quadratic forms, Conference on Quadratic Forms, Baton Rouge, March 1, 1992.
 15. Generators of orthogonal groups over finite fields, Algebra Day VI, Indianapolis, April 25, 1992.

16. Quadratic lattices for which local representation implies global representation, Special Session on Quadratic Forms, A.M.S., San Antonio, Jan. 16, 1993.
17. Factorization and Cryptography, USA Mathematical Olympiad Ceremony, Washington, D.C., June 12, 1995.
18. Multiplicative properties and parametrization of integral binary quadratic forms, Special Session on Number Theory, A.M.S., Middletown, CT, Oct. 12, 2008.

International Symposia

1. Session on Quadratic Forms, Mathematisches Forschungsinstitut Oberwolfach, Oberwolfach, West Germany, May 17-21, 1981. Gave talk "Representation properties of integral ternary quadratic forms."
2. Conference on Quadratic Forms and Hermitian K-Theory, Hamilton, Ontario, Canada, July 11-22, 1983. Gave talk "Representation of integers by ternary quadratic forms."
3. Session on Quadratic Forms, Mathematisches Forschungsinstitut Oberwolfach, Oberwolfach, West Germany, June 2-8, 1985. Invited participant.
4. Conference on Quadratic Forms and Real Algebraic Geometry, Corvallis, Oregon, July 24-30, 1986. Gave talk "Binary quadratic forms and the 2-part of the ideal class group."
5. Conference Internationale de Theorie des Nombres, Quebec, Canada, July 5-18, 1987. Gave talk "Ideal class groups of exponent two and one-class genera of binary quadratic lattices."
6. First Conference of the Canadian Number Theory Association, Banff, Alberta, Canada, April 17-30, 1988. Gave talk "Discriminants and class numbers of indefinite integral quadratic forms."
7. N.A.T.O. Advanced Study Institute on Number Theory and Applications, Banff, Alberta, Canada, April 27-May 5, 1988. Invited participant.
8. Second Conference of the Canadian Number Theory Association, Vancouver, B.C., Canada, August 21-25, 1989. Gave talk "Quadratic forms, class groups and factorization in orders."
9. Quadratische Formen, Mathematisches Forschungsinstitut, Oberwolfach, Germany, May 17-23, 1992. Gave talk "Developments in the spinor genus theory for integral quadratic forms."
10. Formes quadratiques entieres et reseaux, Luminy, Marseille, France, Sept. 7-11, 1992. Gave talk "Successive minima of regular lattices".
11. Groups 1993 Galway/St. Andrews, Galway, Ireland, August 1-14, 1993. Gave talk "Generation of orthogonal groups over finite fields".

12. Fourth Conference of the Canadian Number Theory Association, Halifax, Nova Scotia, Canada, July 2-8, 1994. Gave talk "An application of character sum inequalities to quadratic forms."
13. Integral Quadratic Forms and Lattices, Seoul, Korea, June 15-19, 1998. Invited speaker. Gave talk "Regular and universal positive quadratic lattices."
14. Ganzzahlige quadratische Formen und Gitter, Mathematisches Forschungsinstitut, Oberwolfach, Germany, Jan. 24-30, 1999. Gave talk "Universal and regular quadratic lattices."
15. Symmetries in Science XI, Bregenz, Austria, Aug. 1-6, 1999. Invited participant and session chair.
16. Retirement symposium for Professor O.H. Körner, Universität Ulm, Ulm, Germany, May 2, 2000. Main speaker.
17. Reseaux et formes quadratiques, Centre International de Rencontres Mathematiques, Luminy, Marseille, France, Sept. 25-29, 2000. Invited participant.
18. International Conference on the Algebraic and Arithmetic Theory of Quadratic Forms, Talca, Chile, December 11-18, 2002. Invited speaker. Gave talk "Regularity properties of positive definite quadratic lattices."
19. Second International Conference on the Algebraic and Arithmetic Theory of Quadratic Forms, Lake Llanquihue, Chile, December 13-20, 2007. Invited speaker. Gave talk "Multiplicative properties of integral binary quadratic forms."

Mathematics colloquium talks at the following universities:

1. University of Southern California, 1977, 1979, 1987
2. Southern Illinois University, 1981, 1982, 1989, 1991
3. University of Tennessee, 1981
4. University of Louisville, 1981
5. University of California, Santa Barbara, 1987
6. University of Arizona, 1987
7. Wesleyan University, 2006

G. Other:

1. Assisted in the compilation and classification of reviews of papers in Number Theory for *Reviews in Number Theory: 1973-83*, edited by Richard K. Guy.
2. Reviewer for *Mathematical Reviews*
3. Reviewer for *Zentralblatt für Mathematik*

V. PUBLICATIONS AND CREATIVE WORKS

B. Articles in Professional Journals:

1. Springer-type theorems for spinor genera of quadratic forms, with J. S. Hsia, *Bull. Amer. Math. Soc.* 81(1975), 942-943.
2. Spinor norms of local integral rotations, II, with J. S. Hsia, *Pacific J. Math.* 61(1975), 71-86.
3. Spinor genera under field extensions, I, with J. S. Hsia, *Acta Arith.* 32(1977), 115-128.
4. Spinor genera under field extensions, III, with J. S. Hsia, in *Number Theory and Algebra*, Academic Press, New York, 1977, 43-62.
5. Spinor genera of unimodular Z -lattices in quadratic fields, *Proc. Amer. Math. Soc.* 64(1977), 189-195.
6. Lattices with small class numbers in quadratic fields, Conference on Quadratic Forms (Kingston, Ontario, 1976), Queen's Papers in Pure and Applied Mathematics, vol. 46, Queen's University Press, Kingston, Ontario (1977), 419-421.
7. Spinor genera under field extensions, II, with J. S. Hsia, *Amer. J. Math.* 100(1978), 523-538.
8. Class groups in the genus and spinor genus of binary quadratic lattices, with D. R. Estes, *Proc. London Math. Soc.* 40(1980), 40-52.
9. Congruence conditions on integers represented by ternary quadratic forms, *Pacific J. Math.* 90(1980), 325-333.
10. An algebraic approach to the growth of class numbers of binary quadratic lattices, with D. R. Estes, *Mathematika* 28(1981), 160-168.
11. Partitionings of a genus of quadratic forms, *J. Number Theory* 14(1982), 1-8.
12. On ideal class groups of 2-power exponent, with O. H. Korner, *Proc. Amer. Math. Soc.* 86(1982), 196-198.
13. Representation of spinor exceptional integers by ternary quadratic forms, *Nagoya Math. J.* 93(1984), 27-38.
14. On the representation of integers with large square factors by positive definite ternary quadratic forms, *Mathematika* 31 (1984), 252-257.
15. Exponents of the class groups of imaginary abelian number fields, *Bull. Austral. Math. Soc.* 35 (1987), 231-246.
16. Minimal discriminants of indefinite ternary quadratic forms having specified class number, *Mathematika* 35 (1988), 95-100.
17. Finiteness theorems for number fields having class groups of given 2-power exponent, in *Number Theory and Applications*, NATO ASI Series: Mathematical and Physical Sciences - Vol. 265, Kluwer Academic Publishers, Dordrecht, 1989, 373-380.

18. Binary quadratic forms over rings of algebraic integers, in *Theorie des nombres/Number Theory*, J. M. De Koninck and C. Levesque, eds., Walter de Gruyter, Berlin-New York, 1989, 133-159.
19. Ideal class groups of exponent two and one-class genera of binary quadratic lattices, *Rocky Mountain J. Math.* 19 (1989), 669-673.
20. Discriminants and class numbers of indefinite integral quadratic forms, in *Number Theory* (R. A. Mollin, ed.), Walter de Gruyter, Berlin-New York, 1990, 115-123.
21. Spinor regular positive ternary quadratic forms, with J. W. Benham, J. S. Hsia, and D. C. Hung, *J. London Math. Soc.* 42 (1990), 1-10.
22. On the theta series of positive quaternary quadratic forms, with G. L. Nipp, *C.R. Math. Rep. Acad. Sci. Canada* 13 (1991), 33-38.
23. One-class spinor genera of positive quadratic forms, with J. S. Hsia, *Acta Arith.* 58 (1991), 133-139.
24. Genera of rationally equivalent integral binary quadratic forms, *Proc. Royal Soc. Edinburgh* 119A (1991), 27-30.
25. The distribution of genera among quadratic spaces over global fields, *Proc. Royal Soc. Edinburgh* 123A (1993), 391-397.
26. Two-element generation of orthogonal groups over finite fields, with H. Ishibashi, *J. Algebra* 165 (1994), 164-171.
27. Primitive representations by spinor genera of ternary quadratic forms, with J. S. Hsia and D. C. Hung, *J. London Math. Soc.* 50 (1994), 222-230.
28. The representation of binary quadratic forms by positive definite quaternary quadratic forms, *Trans. Amer. Math. Soc.* 345 (1994), 853-863.
29. Generation of orthogonal groups over finite fields, in *Groups 1993 Galway/St. Andrews*, London Math. Soc. Lecture Notes Series 211 (1995), 172-176.
30. Remarks on the generation of orthogonal groups over finite fields, with
R. A. Catalpa, U. S. Schmidt and G. T. Stewart, *J. Algebra* 176 (1995), 585-590.
31. An application of character sum inequalities to quadratic forms, in *Number Theory* (Karl Dilcher, editor), Canadian Math. Soc. Conf. Proc. 15 (1995), 155-158.
32. Representation of integers by positive definite binary hermitian lattices over imaginary quadratic fields, with A. Khosravani, *J. Number Theory* 62 (1997), 368-374.
33. Universal binary hermitian forms, with A. Khosravani, *Math. Comp.* 66 (1997), 1161-1168.
34. Universal positive quaternary quadratic lattices over totally real number fields, with A. Khosravani, *Mathematika*, 44 (1997), 342-347.

35. Universal and regular positive quadratic lattices over totally real number fields. *Integral quadratic forms and lattices (Seoul, Korea, 1998)*, *Contemp. Math.* 249 (1999), 17-27.
36. Minimal generating sets for unitary groups over finite fields, with B.S. Sears, *International J. Pure Applied Math.* 9 (2003), 59-66.
37. Discriminant bounds for spinor regular ternary quadratic lattices, with W.K. Chan, *J. London Math. Soc.* 69 (2004), 545-561.
38. Regularity properties of positive definite integral quadratic forms, with W. K. Chan and B.-K. Oh, *Contemporary Mathematics* 344 (2004), 59-71.
39. Finiteness results for regular definite ternary quadratic forms over $\mathbf{Q}(\sqrt{5})$, with W.K. Chan, M.I. Icaza and J.Y. Kim, *Int. J. Number Theory* 3 (2007), 541-556.
40. Represented value sets for integral binary quadratic forms, with R.W. Fitzgerald, *Proc. Amer. Math. Soc.* 135 (2007), 3765-3770.
41. Multiplicative properties of integral binary quadratic forms, with R.W. Fitzgerald, *Contemp. Math.*, to appear.

VI. TEACHING EXPERIENCE

A. Teaching Interests and Specialties:

1. Number Theory
2. Abstract Algebra

B. Teaching and Training Grants:

1. National Science Foundation Traineeship, Ohio State University, Columbus, Ohio, 1970-1974
2. "Incorporating Computer Experimentation into an Upper-Division Mathematics Curriculum" (Co-PI with R. Grimmer), National Science Foundation; effective dates 6/1/98 - 5/31/01; award amount \$30,000.
3. "Reaching Out to Academically-Talented, Financially-Disadvantaged Students for Careers in Engineering and Mathematics" (Co-PI with H. Sevim, R. Bravo, and K. Pericak-Spector), National Science Foundation; effective dates 9/1/02 - 8/31/06; award amount \$400,000.

C. Teaching Awards and Honors:

1. Outstanding Teacher Award, College of Liberal Arts, 1985
2. Outstanding Teacher Award, College of Science, 1994
3. Who's Who Among America's Teachers, 2002-2004

D. Current Graduate Faculty Status: Direct Dissertation

E. Number of Master's and Ph.D. Committees on Which Served:

11 Ph.D. (chaired 2), 26 Master's (chaired 12)

F. Names of students who have completed doctoral dissertations under my direction:

1. Azar Khosravani, 1995
2. Scott Sears, 1999

Names of students who have completed Master's theses under my direction:

1. Sandra Cox, 1983
2. Zhenjie Hou, 1987
3. Judy Logsdon, 1989
4. Ronald Nagrodski, 1990
5. Darren Slider, 1991
6. Daniel Brumleve, 1992
7. Gerald Stewart, 1992
8. Elizabeth Tregoning, 1992
9. Robert Catalpa, 1992
10. Ulrich Schmidt, 1992
11. Brian Mercer, 1997
12. Elizabeth Carrico, 1998

VII. UNIVERSITY EXPERIENCE (Southern Illinois University only)

A. Department Committees

1. Search Committee member - Area Open position; Spring, 1982
2. Undergraduate Curriculum Committee; 1982-83, 1985-86, 1986-87
3. Research Committee; 1982-84
4. Select Committee on Promotion and Tenure; 1983-84, 1984-85, 1985-86, 1986-87, 1988-89, 1989-90, 1990-91, 1991-92, 1993-94, 1995-96, 1996-97
5. Graduate Programs Committee; 1983-84, 1986-87, 1990-91, 1991-92, 1992-93, 1993-94
6. Policy and Planning Committee; 1984-85, 1993-94, 1995-96, 1996-97
7. Teaching Review Committee; 1984-85, 1985-86
8. Hiring Committees; 1984-85 (chair), 1989-90 (chair), 1996-97
9. Personnel Committee; 1986-87, 1992-93
10. Undergraduate Honors Committee; 1988-89

B. College and University Committees and Councils:

1. Faculty Senate - Senator from College of Liberal Arts and member of Undergraduate Education Policy Committee, 1983-84. Senator from College of Science and member of Faculty Status and Welfare Committee, 1996-1997; Secretary, 1997.
2. Research Development and Administration Review Committee for Mathematics, Engineering and Physical Sciences, 1991-1994.
3. Search Committee for the Dean of the College of Engineering, 1997-1999.
4. Doctoral Fellowship Panel, 2001-2002.
5. Task Force on Nontenure-track Faculty Policy, 2002.
6. Core Curriculum Executive Council, 2001-present.
7. Honorary Degree and Distinguished Service Award Committee, 2001-2006.
8. Judicial Review Board grievance panel member, 2004.

C. Other:

1. Panel Member - faculty/student panel discussion, Student Orientation Program, SIU, August, 1982.
2. Workshop presenter - "Federal Programs: A View from Inside the Agencies," sponsored by ORDA, March 20, 1996.

VIII. PROFESSIONAL SERVICE

A. Membership in Professional Associations:

1. American Mathematical Society
2. Sigma Xi
3. Mathematical Association of America

D. Evaluation of Manuscripts for Journals and Book Publishers and of Grant Proposals for Agencies:

Referee Reports:

1. *Acta Arithmetica*, 1991, 1994, 1996, 1999, 2004, 2005 (2), 2007, 2008
2. *American Mathematical Monthly*, 1980
3. *Annals of Combinatorics*, 2008
4. *C.R. Math. Rep. Acad. Sci. Canada*, 1990
5. *Canadian Mathematical Bulletin*, 1984, 1998
6. *Canadian Math. Soc. Proc.*, 1994
7. *Contemporary Mathematics*, 2003, 2008
8. *Journal für die Reine und Angewandte Mathematik*, 2007
9. *Journal of Algebra, Number Theory and Applications*, 2002
10. *Journal Combin. Math. & Combin. Comput.*, 1993
11. *Journal of the London Mathematical Society*, 2007
12. *Journal of Mathematical Analysis and Applications*, 2005
13. *Journal of Number Theory*, 1982, 1988 (2), 1989, 1990, 1991, 1992 (2), 1995, 2000, 2009
14. *Lecture Notes in Mathematics*, 1989
15. *Linear Algebra and Its Applications*, 2005, 2008
16. *Linear and Multilinear Algebra*, 1985
17. *Mathematika*, 2000
18. *Mathematische Zeitschrift*, 1992, 2002
19. *Nova J. Algebra*, 1992
20. *Pacific Journal of Mathematics*, 1992, 2000
21. *Proceedings of the American Mathematical Society*, 2003, 2005
22. *Proceedings of the London Mathematical Society*, 2007
23. *Proceedings of Conference Internationale de Theorie des Nombres*, 1987
24. *The Ramanujan Journal*, 2006
25. *Rocky Mountain Journal of Mathematics*, 1986, 1999
26. *Transactions of the American Mathematical Society*, 1998, 2000

Grant Proposals Evaluated:

1. National Science Foundation, 1984, 1990, 1991 (2), 1993, 1994, 1996 (2), 1997(2), 1998(2), 1999, 2000(2), 2002(3)
2. National Security Agency, 1997, 2001, 2002
3. Natural Sciences and Engineering Research Council of Canada, 1995, 2002
4. Chilean Research Council, 1995, 1996, 1998, 1999, 2003, 2004, 2007(2)
5. Review panel, National Science Foundation Interdisciplinary Grants in the Mathematical Sciences program, December 18-20, 1997
6. Review panels, National Science Foundation, Course, Curriculum and Laboratory Improvement program, Jan. 31-Feb. 1, 2005; July 25-26, 2005; July 6-7, 2006; March 12-13, 2007

Pre-publication reviews of textbook manuscripts:

1. Prindle, Weber and Schmidt Publishers 1976, 1980, 1982, 1983
2. Allyn and Bacon, Inc. 1981
4. D. C. Heath and Co. 1984, 1985

IX. COMMUNITY SERVICE

1. Vice-president and Program Chairman of Southern Illinois Audubon Society, 1982 and 1983; President, 1988 and 1989.
2. Administrative Board member, First United Methodist Church of Carbondale, 1985-87, 1996-present; Financial Secretary, 1996-present; Committee on Finance, 1996-present.