

# Elizabeth A. Arnold

Department of Mathematics and Statistics  
James Madison University  
Harrisonburg, VA 22807  
(540) 568-6532  
<http://educ.jmu.edu/~arnoldea>  
[arnoldea@jmu.edu](mailto:arnoldea@jmu.edu)

## Academic Experience

**James Madison University**, Department of Mathematics and Statistics, Harrisonburg, Virginia.  
*Assistant Professor* 2004 - 2010.  
*Associate Professor* 2010 - 2021.  
*Professor* 2021 - present.

**Texas A&M University**, Department of Mathematics, College Station, Texas.  
*Visiting Assistant Professor* 2000 - 2003. VIGRE postdoctoral fellow.  
*Visiting Scholar* 2003 - 2004.

**University of Maryland**, Department of Mathematics, College Park, Maryland.  
*Graduate teaching assistant.* 1994-2000.

**George Mason University**, Department of Mathematics, Fairfax, Virginia.  
*Graduate teaching assistant.* 1993-1994.

**Fairfax County Public Schools**, Fairfax, Virginia.  
*High school mathematics teacher.* January 1992- June 1993.

## Education

**University of Maryland, College Park, Maryland**  
Ph.D. in Mathematics, May 2000  
Advisors: Dr. William W. Adams and Dr. Philippe Loustaunau  
Field of Study: Computational Commutative Algebra

**George Mason University, Fairfax, Virginia**  
M.Ed., Curriculum and Instruction, Mathematics, August 1993

**Georgetown University, Washington, District of Columbia**  
B.A., Government, May 1989

## Publications

“Nest graphs and minimal complete symmetry groups for magic Sudoku variants”, with John Lorch, Laura Taalman, Rebecca Field, and Stephen Lucas. *Rocky Mountain Journal of Mathematics*, Vol. 45, no.3, (2015), 887-901.

“Minimal complete Shidoku symmetry groups” with Laura Taalman, Rebecca Field, and Stephen Lucas, *Journal of Combinatorial Mathematics and Combinatorial Computing*, Volume 87, (2013), 209228.

“Bruno Buchberger and the world of Gröbner bases”, with Ilias Kotsireas and Markus Rosenkranz, *Journal of Symbolic Computation*, Volume 46, Issue 5, May 2011, Pages 495-497.

“Gröbner Basis Representations of Sudoku”, with Laura Taalman and Stephen Lucas. *College Mathematics Journal*, March 2010, Volume 41, Number 1.

“Modular Algorithms for Computing Gröbner Bases”. *Journal of Symbolic Computation*, April 2003, Volume 35, (4), p. 403-419.

“Fast Gröbner Basis Computation for Boolean Polynomials”, with Franziska Hinkelmann.

## Undergraduate Research Student Publications

Harrison Chapman (Bowdoin College) and Malcolm Rupert (Western Washington University), “A Group-theoretic Approach to Human Solving Strategies in Sudoku”, *Colonial Academic Alliance Undergraduate Research Journal*: Vol. 3, Article 3, 2012.

## Software

“BooleanGB” with F. Hinkelmann and M. Stillman. Software in Macaulay2 for computing Gröbner bases in Boolean rings.

## Grants Awarded

**Dave Pruett Faculty Endowment Grant** for Math 470. Joint with Jenny Gibson. 2019. \$4900.

**Faculty Senate Mini-Grant Engagement Award** for EYH 2018. PI with Katie Quertermous. \$1200.

**STEM Center Grant** for assessment for EYH 2016. PI with Katie Quertermous. \$3327.

**JMU Diversity IDEA Grant** for EYH 2015. PI with Katie Quertermous. \$2000.

**MAA Tensor Grant** for EYH 2013. Project Director. \$5,900.

**MAA Tensor Grant** for EYH 2011. Project Director. \$5,000.

**MAA Tensor Grant** for EYH 2009. Co-PI. With Carla Martin. \$5,000.

**NISS University Affiliates Proposal Development Fund** Co-PI with Dr. Kimberly Sellers. Awarded September 2003. \$10,000.

## Invited Talks and Conferences

**Virginia Mathematics and Science Coalition Programs That Work Poster Presentation.** J. Sergeant Reynolds Community College, Richmond, VA. February 18, 2020.

**1st Mathematics Of Various Entertaining Subjects (MOVES) Conference,** Museum of Mathematics, New York, August 2013. Contributed Talk.

**MAA Sectional Meeting** George Mason University, November 6, 2010. Contributed Talk.

**Macaulay 2 Workshop,** Colorado College, Colorado Spring, CO, August 12, 2010.

**MAA Sectional Meeting** Virginia State University, April 17, 2010. Contributed Talk.

**James Madison University Mathematics Colloquium,** Harrisonburg, VA. April 12, 2010.

**Virginia Council of Teachers of Mathematics (VCTM) Conference** James Madison University, March 13, 2010. Workshop with Carla Martin, Elizabeth Brown and Colleen Watson.

**CSM Faculty Research and Teaching Symposium** February 16, 2010. Poster.

**Macaulay 2 Workshop,** Mathematical Sciences Research Institute, Berkeley, CA, January 10, 2010.

**MAA Sectional Meeting** Goucher College, Baltimore, MD. November 14, 2009. Contributed Talk.

**EYH,** James Madison University, April 26, 2008. Workshop presentation for high school students.

**Georgetown University Mathematics Colloquium,** Washington, DC. February 15, 2008.

**James Madison University Mathematics Colloquium,** Harrisonburg, VA. Nov. 12, 2007.

**Washington and Lee University Mathematics Colloquium,** Lexington, VA. March, 2004

**James Madison University Mathematics Colloquium,** Harrisonburg, VA. March 24, 2004.

**Emory & Henry College Colloquium,** Abingdon, VA. February 2004.

**American Institute of Mathematics Workshop on Computational Algebraic Statistics,** Palo Alto, CA. December 14-18, 2003.

**Central Texas Algebra Conference,** Baylor University, Waco, TX, February 22, 2003.

**GROSTAT V.** Tulane University, September 5, 2001.

**ISSAC 2001.** University of Western Ontario, London, Ontario. July 22-25, 2001. Poster.

**COCOA VII Conference and School.** Queen's University, Kingston, Ontario. July 16-21, 2001.

**IMACS-ACA '2001.** Albuquerque, New Mexico, June, 2001.

**Kolchin Seminar in Differential Algebra**, City College of the City University of New York, February 17, 2001.

**Computational Commutative Algebra Seminar**, Rutgers University, February 15, 2001.

**AMS Fall Eastern Sectional Meeting**, Special Session: Differential Algebra and Related Topics, Columbia University, New York, NY, November 5, 2000.

**Algebra/Combinatorics Seminar**, Texas A&M University, College Station, TX, Sept. 14, 2000.

**Colloquium**, Research Institute for Symbolic Computation, Linz, Austria, May 29, 2000.

**Faculty Colloquium**, United States Naval Academy, Annapolis, MD, March 2000.

**Texas Symbolic Computation Week**, Lamar University, Beaumont, TX, March 2000.

**Student/Faculty Colloquium**, University of Maryland, College Park, MD, February 14, 2000.

**Algebra/Combinatorics Seminar**, Clemson University, Clemson, SC, February 3, 2000.

**AMS Joint Mathematics Meetings**, Special Session: Effective Methods in Commutative Algebra, Washington DC, January 2000.

**Mathematics Department Colloquium**, George Mason University, Fairfax, VA, Nov. 19, 1999.

**Algebra Seminar**, University of Maryland, College Park, MD, November 15, 1999.

**Women in Math Seminar**, University of Maryland, College Park, MD, October 27, 1999.

**Association for Women in Math**, Olga Taussky-Todd Celebration, MSRI, Berkeley, CA, July 17, 1999.

**Women in Math Seminar**, University of Maryland, College Park, MD, November 19, 1997.

## Honors and Awards

**African, African American Diaspora Studies (AAAD) Institute Participant** one of twelve applicants selected University-wide to participate in the institute. September 2020.

**Virginia Mathematics and Science Coalition Programs That Work Award** for EYH with EYH Leadership Team. February, 2020.

**Workshops** Macaulay 2 Workshop at Colorado College, August 8-12, 2010. Macaulay 2 Workshop at MSRI, January 8-12, 2010. American Institute of Mathematics Workshop on Computational Algebraic Statistics, Palo Alto, CA, December 14-18, 2003. COCOA VII Conference and School, Queen's University, Kingston, Ontario, July 16-21, 2001. All expenses paid.

**NSF VIGRE Post-doc.** Texas A & M University. 2000-2003.

**Excellence in Teaching Departmental Award**, Mathematics Department, University of Maryland, Spring 1997

**Maryland English Institute's International Teaching Assistant training video** *One of four graduate teaching assistants featured on an instructional video for new international teaching assistants*, Fall 1997

**University of Maryland Supplemental Fellowship.** 1994-1997.

## Professional Service

### Service to the Department

**Diversity Committee**, founder and Chair. 2020.

**C&I Committee**, Secretary, 2012-17.

**Student Awards Committee**, 2011-13, 2015, 2016, 2017, 2018,

**M&S PAC** 2017/18, 2018/19, 2019/20.

**Academic Program Review Committee**, 2015-2016.

**M&S Search Committee**, 2011-2012. Open position and IDLS positions.

**Assessment Committee**, 2010-2011 - Revised Assessment Progress Template (APT).

**Pure Math Committee**, 2004-present.

**Education/IDLS/Secondary Education/Graduate Education Committee**, one of these names, 2004-present.

### Service to the College and University

**CSM Diversity Council**, 2019-present.

**EYH Advisory Team**, 2016-present.

**JMU Honor Council**, 2011-13, 2015-present.

### Service to the Profession

**Referee**, *Journal of Symbolic Computation*, *AAECC*, *Mathematics and Computers in Simulation*, *Illinois Journal of Mathematics*, *Mathematics of Computation*, *ISSAC*.

**Panelist Reviewer**, NSF Graduate Research Fellowship Program. 2010-2013

**Co-Editor**, [Special Issue](#) *Journal of Symbolic Computation*, Gröbner Bases and their Applications. Volume 46, Issue 5, May 2011, Pages 495-497.

**Session Chair and Judge** Young Mathematician's Conference, Ohio State University, August 27-29, 2010.

**Mentor**, NSF REU Summer program, James Madison University. Summer 2010.

**Mentor**, NSF REU Summer program. Summer 2009.

**Session Chair and Judge** Young Mathematician's Conference, Ohio State University, August 28-30, 2009.

**Special Session Co-Organizer**, "[Gröbner Bases and their Applications](#)", ACA 2008, RISC-Linz, Austria, July 27-30, 2008.

**Organizer**, “Mid-Atlantic Algebra Conference”, James Madison University, April 29, 2006.

**Co-Editor**, Special Issue of *Mathematics and Computers in Simulation* Vol. 67, Issues 1-2, September 3, 2004.

### Outreach Service

**Conference Director/Co-Director**, “Expanding Your Horizons”, James Madison University, 2008-present.

**Conference Co-Director and Workshop Leader**, “Expanding Your Horizons”, James Madison University, April 26, 2008.

### Service Prior to JMU

**Special Session Co-Organizer**, “Applications of Gröbner Bases”, ACA 2002, Volos, Greece, June 25-28, 2002.

**Special Session Co-Organizer**, “Computational Commutative Algebra and Algebraic Geometry”, AMS Joint Meetings, San Diego, CA, January 6-10, 2002.

**Texas A&M University Combinatorics and Algebra Seminar**, Co-Organizer, 2001-2002.

**College of Mathematics and Physical Sciences Dean Search Committee**, University of Maryland, Fall 1998, Spring 1999.

**Graduate Committee**, Mathematics Department, University of Maryland, Graduate Student Representative, Fall 1998, Spring 1999.

**Women in Math**, University of Maryland, Co-Organizer, Fall 1998, Spring 1999.

**University of Maryland Equestrian Team**, Faculty Advisor, Fall 1998-Spring 2000.