

Laurie J. Heyer
CURRICULUM VITAE

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EDUCATION

University of Colorado, Boulder
University of Texas, Arlington

PhD, Applied Mathematics (1998)
MS, Mathematics (1993)
BS, Mathematics (1986)

EXPERIENCE

Davidson College

Director, James G. Martin Genomics Program (2020-present)

Coordinator, Data Science Interdisciplinary Minor (2017-present)

- *Developed new introductory course, "Data Science and Society"*
- *Developed new interdisciplinary minor proposal for Educational Policy Committee and faculty approval (approved Spring 2017)*
- *Interface with faculty advisory committee drawn from seven departments*
- *Manage curricular updates across twelve disciplines*
- *Advise each declared minor (22 minors in class of 2022, largest on campus)*
- *Administer Davidson participation in LACOL consortium shared course*
- *Proposed and hired first Visiting Assistant Professor of Data Science*

Faculty in Residence, Jay Hurt Hub for Innovation and Entrepreneurship (2018-2021)

- *Direct report to the President*
- *Develop opportunities for course projects in collaboration with external partners*
- *Plan programs for faculty, staff and students to build communication and technical skills*
- *Pitched idea for "Data Lab" to major donor; implemented idea by hiring student tutors and paying faculty stipends*
- *Design and administer applied research and tech impact fellowships*
- *Cultivate relationships with faculty, alumni, donors, corporate sponsors, local investors, community organizations, trustees, and advisory board members*
- *Collaborate with staff from with College Relations, Center for Career Development, Human Resources, Library, and Center for Civic Engagement*

Chair, Department of Mathematics and Computer Science (2013-2017)

- *Conducted annual performance reviews for twelve departmental colleagues*
- *Wrote three proposals for new faculty positions*
- *Led successful searches for two tenure track and five visiting faculty*

- *Shepherded development of Computer Science major, approved Fall 2016*
- *Performed assessment for SACS reaccreditation*

Professor of Mathematics

- Full Professor (2013-present; John T. Kimbrough professorship since 2014)
- Associate Professor (2006-2013; L. Richardson King professorship 2004-2008)
- Assistant Professor (2000-2006)

Co-director and mentor, Community Research Fellowship program (2020-present)

Committee and Task Force Service

- Educational Policy Committee (2020-present)
 - Curriculum
 - Academic regulations
 - Faculty Hiring Advisory sub-committee
- Faculty Executive Committee (2016-18)
- Strategic Planning:
 - Co-lead, Design team and Build team, “COVID-19 Response: High Impact Experiential Learning” (2020)
 - Co-Convener, “Community” Investigative Team (2018)
 - Planning Advisory Group (Spring 2018)
 - Implementation Team: Depth and Other Studies (2009)
 - Committee on Curriculum Development (2008-2009)
 - Teaching and Learning Study Group; working group chair (Spring 2008)
- Trustee Committee Faculty Representative
 - Athletics (2009-2010, 2013-2014)
 - Campus and Religious Life (2004-2006)
- Experiential Learning Team (2018-2021)
- Innovation Council (2018-2021)
- Classroom Design Committee (2016-2019)
- Search Committee, Director of Hurt Hub (Fall, 2020)
- Search Committee, Chief Information Officer (Fall, 2015)
- Faculty Tenure Committee (2013-2016)
- Professional Affairs Committee (2010-2013)
- Student Conduct Council (2006-2009)
- Academic Computing Committee (2006-2009)
- Self-Selection Task Force (2003-2004)
- Religious Life Council (2002-2005)

Mathematical Association of America

Chair-Elect (2018-2019), Chair (2019-2021) and Past Chair (2021-2022), Southeastern Section

- *Convene an executive board of 20 officers across five-state region*
- *Nominate and appoint committee members*
- *Interface with national office*

Leitzel Lecture selection committee (2011-2016; chair, 2014-2016)

Student Activities Coordinator, Southeastern Section (inaugural holder; 2007-2013)

- *Coordinated volunteers for Math Jeopardy, Treasure Hunt, poster session*
- *Organized student paper sessions and graduate school / career fair*
- *Instituted new lecture series for students*

Chair-Elect (2007-2008), Chair (2008-2009) and Past Chair (2009-2010) of Mathematical and Computational Biology Special Interest Group (BIOSIGMAA)

University of Southern California

Postdoctoral Research Associate and Instructor, Center for Computational and Experimental Genomics (1998-2000)

University of Colorado, Boulder

Graduate Research Assistant (1996-1998)

Graduate Teaching Assistant (1994-1996)

Lockheed Martin Vought Systems, Grand Prairie TX

Lead Operations Research Analyst (1986-1994)

HONORS AND AWARDS

2022	Hunter-Hamilton Love of Teaching Award, Davidson College
2021	HHMI FIRST RATE Inclusive Teaching Fellowship, Davidson College
2010	Thomas Jefferson Award, Davidson College
2009	Journal of Biological Engineering Outstanding Paper
2009	Matthews Travel Award, Davidson College
2008	Journal of Biological Engineering Outstanding Paper
1998-2000	Program in Mathematics and Molecular Biology (PMMB) National Science Foundation Postdoctoral Fellowship
1997-1998	Francis P. Stribic Fellowship, University of Colorado
1997-1998	Preparing Future Faculty Fellowship

GRANTS

2016-2020	NSF grant "Collaborative Research: RUI: Broadening the Application of Programmed Evolution for Metabolic Engineering" (Co-PI)
2013-2016	NSF grant "Collaborative Research: RUI: BIOMAPS: Modular Programmed Evolution of Bacteria for Optimization of Metabolic Pathways" (Co-PI)
2011-2013	NSF grant "RUI: MPS-BIO: Collaborative Research: Design and Construction of Second-Generation Bacterial Computers" (Co-PI)

- 2011-2014 NSF grant "Workshop: Synthetic Biology Workshops for Interdisciplinary Teams of Undergraduate Faculty to be held Summers of 2012-2014 " (Co-PI)
- 2007-2011 NSF grant "Collaborative Proposal: UBM Group: Synthetic Biology Research for Undergraduates (SyBR-U)" (PI)
- 2006-2008 NSF grant "Collaborative Proposal: GCAT DNA Microarray Workshops for 2007, 2008 and 2009" (Co-PI)
- 2005 NSF grant "DNA Microarray Summer Workshop for Undergraduate HBCU and Tribal College Faculty" (Co-PI)
- 2004 MAA grant for Undergraduate Mathematics Conference at Davidson College
- 2004-2008 HHMI (Howard Hughes Medical Institute) grant (Key Personnel)
- 2004 NSF grant "Microarray Workshop for Undergraduate Faculty" (Co-PI)
- 2003 ACS (Associated Colleges of the South) Technology Fellow
- 2003 NSF grant "Microarray Workshops for Undergraduate Faculty and Students: Rocket Science or Basic Science?" (Co-PI)
- 2002 NSF REU (Research Experience for Undergraduates) Supplement (Co-PI)
- 2001-2003 NSF MUE (Multi-User Equipment) Grant (Co-PI)

PUBLICATIONS

* indicates undergraduate coauthors

^ indicates secondary school coauthors

Textbooks:

Campbell, A.M., L.J. Heyer and C.J. Paradise (2014, 2018). Integrating Concepts in Biology. Trunity. <https://www.trunity.com/trubook-integrating-concepts-in-biology-by-campbell-heyer-paradise.html>

Campbell A.M. and L.J. Heyer (2002, 2006). Discovering Genomics, Proteomics and Bioinformatics, 2nd Edition. Benjamin Cummings and Cold Springs Harbor Laboratory Press.

Campbell A.M. and L.J. Heyer (2006). Instructors Guide to Discovering Genomics, Proteomics and Bioinformatics, 2nd Edition. Benjamin Cummings.

Research Articles:

Finby[^], B., L.J. Heyer, A.M. Campbell (2021). Data-rich textbook figures promote core competencies: comparison of two textbooks. *Biochemistry and Molecular Biology Education* 49(3):392-406. DOI: 10.1002/bmb.21488

Koucky*, O, et al. [27 undergraduate student and 4 faculty co-authors] (2020). Synthetic Biology Bicistronic Designs Support Gene Expression Equally Well *in vitro* and *in vivo*. *American Journal of Undergraduate Research* 17(1): 13 - 20. DOI:10.33697/ajur.2020.012

Shaver*, Z.M., et al. [27 undergraduate student and 3 faculty co-authors] (2018). Attempted Use of PACE for Riboswitch Discovery Generates Three New Translational Theophylline Riboswitch Side Products. *BMC Research Notes* 11. DOI:10.1186/s13104-018-3965-6.

Chester*, J., L. Edlin*, J. Galeota-Sprung*, B. Isom*, A. Moore*, V. Perkins*, A.M. Campbell, T.T. Eckdahl, L.J. Heyer, J.L. Poet (2016). On counting limited outdegree grid digraphs and greatest increase grid digraphs. *Involve* 9(2): 211-221.

Heyer, L.J., A. Lubiw, D. Mondal, U. Stege, and S. Whitesides (2015). Reconfiguring a Chain of Cubes. In *Proceedings of the 27th Canadian Conference on Computational Geometry, CCCG 2015*

Eckdahl, T.T., et al. [49 undergraduate student and 6 faculty authors] (2015). Programmed evolution for optimization of orthogonal metabolic output in bacteria. *PLOS One*. DOI: 10.1371/journal.pone.0118322

R. Allen, L.J. Heyer, R.I. Nishat, S. Whitesides (2013) Grid proximity graphs: LOGs, GIGs and GIRLs. In *Proceedings of Canadian Conference on Computational Geometry, CCCG 2013*

Barsoum, M.J., P.J. Sellers, A.M. Campbell, L.J. Heyer, C.J. Paradise (2013). Implementing recommendations for introductory biology by writing a new textbook. *CBE – Life Sciences Education* 12(1): 106 - 116.

Taylor*, D. L., A.M. Campbell and L.J. Heyer (2013). Illuminating the black box of genome sequence assembly: a free online tool to introduce students to bioinformatics. *The American Biology Teacher* 75 (8): 572 577.

Bremner, D., W. Evans, F. Frati, L.J. Heyer, S. Kobourov, W. Lenhart, G. Liotta, D. Rappaport, S. Whitesides (2012). On representing graphs by touching cuboids. In *Proceedings of 20th International Symposium on Graph Drawing (GD2012)*.

Sawyer*, E.M., C. Barta*, R. Clemente*, M. Conn*, C. Davis*, C. Doyle*, M. Gearing*, O. Ho-Shing*, A. Mooney*, J. Morton*, S. Punjabi*, A. Schnoor*, S. Sun*, S. Suresh*, B. Szczepanik*, D. L. Taylor*, A. Temmink*, W. Vernon*, A.M. Campbell, L.J. Heyer, J.L. Poet, T.T. Eckdahl (2012). Bacterial logic devices reveal unexpected behavior of frameshift suppressor tRNAs. *Interdisciplinary Bio Central*. 4, article 10. DOI: 10.4051/ibc.2012.4.3.0010

Pearson* B., S. Snell*, K. Bye-Nagel*, S. Tonidandel, L.J. Heyer, A.M. Campbell (2011). Word selection affects perceptions of synthetic biology. *Journal of Biological Engineering*. 5:9. DOI:10.1186/1754-1611-5-9

Pearson* B., K. H. Lau*, A. Allen*, J. Barron*, R. Cool*, K. Davis*, W. DeLoache*, E. Feeney*, A. Gordon*, J. Igo*, A. Lewis*, K. Muscalino*, M. Parra*, P. Penumetcha*, V.G. Rinker*, K. Roland*, X. Zhu*, J.L. Poet, T.T. Eckdahl, L.J. Heyer, A.M. Campbell (2011). Bacterial hash function using DNA-based XOR logic reveals unexpected behavior of the LuxR promoter. *Interdisciplinary Bio Central*. 3, article 10, DOI:10.4051/ibc.2011.3.3.0010.

Bakke*, P., N. Carney*, W. DeLoache*, M. Gearing*, K. Ingvorsen, M. Lotz*, J. McNair*, P. Penumetcha*, S. Simpson*, L. Voss*, M. Win*, L.J. Heyer, A.M. Campbell (2009). Evaluation of three automated genome annotations for *Halorhabdus utahensis*. *PLoS ONE*. 4 (7): e6291. DOI:10.1371/journal.pone.0006291

Baumgardner*, J., K. Acker*, O. Adefuye*, S.T. Crowley*, W. DeLoache*, J.O. Dickson*, L. Heard*, A.T. Martens*, N. Morton*, M. Ritter*, A. Shoecraft*, J. Treece*, M. Unzicker*, A. Valencia*, M.Waters*, A.M. Campbell, L.J. Heyer, J.L. Poet, T.T. Eckdahl (2009). Solving a Hamiltonian path problem with a bacterial computer. *Journal of Biological Engineering*. 3:11

Haynes, K.A., M.L. Broderick*, A.D. Brown*, T.L. Butner*, J.O. Dickson*, W.L. Harden*, L.H. Heard*, E.L. Jessen*, K.J. Malloy*, B.J. Ogden*, S. Rosemond*, S. Simpson*, E. Zwack*, A.M. Campbell, T.T. Eckdahl, L.J. Heyer, J.L. Poet (2008). Engineering bacteria to solve the burnt pancake problem. *Journal of Biological Engineering* 2:8.

Eckdahl, T.T., A.D. Brown*, S.N. Hart*, K.J. Malloy*, M. Shott*, G. Yiu*, L.L.M. Hoopes, L.J. Heyer (2008). Microarray analysis of the in vivo sequence preferences of a minor groove binding drug. *BMC Genomics* 9:23.

Haynes, K.A., M.L. Broderick*, A.D. Brown*, T.L. Butner*, L. Harden*, L. Heard*, E. Jessen*, K. Malloy*, B. Ogden*, S. Rosemond*, S. Simpson*, E. Zwack*, A. M. Campbell, T.T. Eckdahl, L.J. Heyer, J.L. Poet (2007). Computing with living hardware. *IET Synthetic Biology* 1: 44-47.

Campbell, A.M., W.T. Hatfield, L.J. Heyer (2007). Letter to the Editor: Make microarray data with known ratios. *CBE – Life Sciences Education* 6: 196-197.

Campbell, A.M., M.L.S. Ledbetter, L.L.M. Hoopes, T.T. Eckdahl, L.J. Heyer, A.G. Rosenwald, E. Fowlks, S. Tonidandel, B. Bucholtz*, G. Gottfried (2007). Genome Consortium for Active Teaching: meeting the goals of BIO2010. *CBE – Life Sciences Education* 6:109-118.

Heyer, L.J., D.Z. Moskowitz*, J.A. Abele*, P. Karnik*, D. Choi*, A.M. Campbell, E.E. Oldham*, B.K. Akin* (2005). MAGIC Tool: Integrated microarray data analysis. *Bioinformatics* 21:2114-2115.

Heyer L.J. (2000). A generalized Erdős-Rényi law for sequence analysis problems. *Methodology and Computing in Applied Probability* 2:309-329.

Heyer, L.J., S. Kruglyak, S. Yooshep (1999). Exploring expression data: Identification and analysis of coexpressed genes, *Genome Research* 9:1106-1115.

Gorodkin, J., L.J. Heyer, S. Brunak, G.D. Stormo (1997). Displaying the information content of structural RNA alignments: the structure logos, *CABIOS* 13:583-586.

Gorodkin, J., L.J. Heyer, G.D. Stormo (1997). Finding the most significant common sequence and structure motifs in a set of RNA sequences, *Nucleic Acids Research* 25:3724-3732.

Gorodkin, J., L.J. Heyer, G.D. Stormo (1997). Finding common sequence and structure motifs in a set of RNA sequences. In T. Gaasterland, P. Karp, K. Karplus, C. Ouzounis, C. Sander and A. Valencia (eds), *Proceedings of the Fifth International Conference on Intelligent Systems in Molecular Biology*. AAAI Press, Menlo Park, CA. pp 120-123.

Expository Articles, Book Chapters, Reviews and Essays:

Heyer, L.J., J.L. Poet (2014) Synthetic biology: a new frontier. *American Mathematical Monthly*. 121:857-867

Campbell, A.M., M.J. Nakano*, C.J. Vrana*, T.T. Eckdahl, J.L. Poet, L.J. Heyer (2012). Letter to the editor: Providing structure for research students coming and going. *CBE – Life Sciences Education* 11:337-338

Campbell, A.M., L.J. Heyer, T.T. Eckdahl, J.L. Poet (2012). Integrating synthetic biology into the microbiology curriculum. *Microbe* 7(10):460-465

Heyer L.J. and A.M. Campbell (2011). Teaching bioinformatics and genomics: An interdisciplinary approach. In MB Cozzens and FS Roberts, ed. *BioMath in the Schools: DIMACS Series in Discrete Mathematics and Theoretical Computer Science*. 76:49-60.

Eckdahl, T.T., A.M. Campbell, L.J. Heyer, J.L. Poet, (2010). Synthetic biology and the international genetically engineered machines competition. *BIOS* 81(1): 1-6.

Heyer, L.J., J.L. Poet, M.L. Broderick*, P.E.C. Compeau*, J.O. Dickson*, and W.L. Harden*, (2010) Bacterial computing: using E. coli to solve the burnt pancake problem. *Math Horizons* 17:5-10.

Poet, J.L., A.M. Campbell, T.T. Eckdahl, L.J. Heyer (2010). Bacterial computing. *Crossroads: The ACM Magazine for Students*. 17(1): 1015.

Eckdahl, T.T. J.L. Poet, A.M. Campbell, L.J. Heyer (2009). Synthetic biology as a new opportunity for multidisciplinary undergraduate research. *CUR Quarterly*. Winter Issue. 39 - 44.

L.J. Heyer (2008) Learning the lingo. *CBE – Life Science Education* 7:294-295.

L.J. Heyer (2008) A Mathematical Optimization Problem in Bioinformatics. *PRIMUS* 18:101-118.

A.M. Campbell, C.A. Zanta, L.J. Heyer, B.Kittinger*, K.M. Gabric, and L. Adler (2006). DNA microarray wet lab simulation brings genomics into the high school curriculum. *CBE – Life Science Education* 5:332-339.

A.M. Campbell, T.T. Eckdahl, E. Fowlks, L.J. Heyer, L.L.M. Hoopes, M.L. Ledbetter, and A.G. Rosenwald (2006). Genome Consortium for Active Teaching (GCAT). *Science* 311:1103-1104.

L.J. Heyer (2003). Bioinformatics: building biology's information superhighway. *Transformations: Liberal Arts in the Digital Age* 1:2

Software:

Gig-Hub Student dashboard (preliminary version). With Nade Bai and Abigail Santiago. (Available only on Davidson campus at <https://shinyapp0.davidson.edu/app/github-shiny>)

ProFind keyword search for faculty expertise (preliminary version). With Daniel Cowan and Brad Shook. (Available only on Davidson campus at <https://shinyapp0.davidson.edu/app/profind>)

Campus COVID-19 dashboard. With Owen Bezick, Calvin Spencer and Chris Marsicano. https://collegecrisis.shinyapps.io/CV-19_Front-End/

College Crisis Initiative (C2i) dashboard. With Owen Bezick, Nathan Jordan, Ethan Rodier and Chris Marsicano. <https://collegecrisis.shinyapps.io/dashboard/>

Cat Sched online course schedule and classroom assignment tool. With Ashley Alexander-Lee and John Michael Murphy. (Available only on Davidson campus at <https://catsched.davidson.edu>)

Cats REACT (Real-Time Assessment of Classroom Teaching) scheduled quick feedback tool, with H. Altisnik* and R. Strauss*. (Available only on Davidson campus at <https://cats-react.i.its.davidson.edu>)

Self-Selection Assignment Portal (Available only on Davidson campus at <https://self-selection.i.its.davidson.edu/>)

Cat Select, a project preferences optimization tool. (Available only on Davidson campus at <https://cat-select.i.ti.davidson.edu>)

Lula Bells Resource Center web site, with J. Balcazar*, A. Hidalgo*, H. Mulat*, and A. Roy Battacharya*, at <http://lulabells.davidson.edu>

The Workload Tracker, with A. Alexander-Lee*, H. Mulat*, and K. Williams*, available at <http://pronto.davidson.edu/workloadtracker/>

Microarray Math Module, available at http://www.bio.davidson.edu/projects/GCAT/HsChips/hs_kit_math_module_v2.pdf

Microarray Genome Imaging and Clustering Tool (MAGIC Tool) open source software for microarray data analysis. In collaboration with J.A. Abele*, B.K. Akin*, A. M. Campbell, D. Choi*, M.L. Cowell*, N. Dovidio*, M. Gordon*, W.T. Hatfield, P. Karnik*, D.Z. Moskowitz*, E.E. Oldham*, G.W. Taylor* and M. Trawick*. Available at <http://bio.davidson.edu/magic>

Exploring Diauxic Shift Microarray Data with MAGIC Tool. Lab exercise for analyzing microarray data with MAGIC Tool
http://gcat.davidson.edu/GCAT/workshop2/derisi_lab.html

FOLDALIGN freely available software for simultaneous folding and alignment of RNA sequences. In collaboration with J. Gorodkin and G. Stormo. Newer version available at <https://rth.dk/resources/foldalign/>

PRESENTATIONS

Workshops and short courses:

“Introductory Biology Can Teach Your Students to Think and Communicate Like Scientists” (with A.M. Campbell and C.J. Paradise), at NABT Annual Meeting (November 2018)

DIBS (Data in Biological Sciences) Workshop for faculty (with A.M. Campbell and C.J. Paradise), at PULSE Institute, Wofford College (June 2016)

GCAT Synthetic Biology Workshops for faculty (with A.M. Campbell, T.T. Eckdahl and J.L. Poet):

- University of Maryland, Baltimore County (June 2014)
- HHMI Janelia Farm Research Campus (June 2012, June 2013)
- Missouri Western State University (June 2011)
- Davidson College (June 2010)

Summer microarray / MAGIC Tool workshops for undergraduate HBCU and tribal college faculty (with A.M. Campbell, T.T. Eckdahl, and others):

- Morehouse College (July 2005, July 2007, July 2009)
- California State University Fullerton (July 2008)

Keck Curriculum Consultancy, two-day workshop for faculty at Hampton University, May 2008

“Where Mathematics Meets Molecules.” Principal Lecturer at week-long workshop for MAA North Central Section Summer Seminar, University of Minnesota at Duluth (July 2005)

Bioinformatics. Half-day session in MAA Professional Enhancement Programs (PREP) Workshop on Computational and Mathematical Biology (July 2004)

NSF Summer Microarray / MAGIC Tool Workshops for Undergraduate Professors (with A.M. Campbell, T.T. Eckdahl, and others), Georgetown University (July 2004)

Hands-on Teaching of Bioinformatics: Keynote Address at Hope College (May 2004)

Microarray Data Analysis. Half-day workshop on MAGIC Tool at BIO21 conference (October 2003)

Data Analysis with MAGIC Tool. Half day workshop at Institute for Systems Biology, Seattle, WA (August 2003)

Microarray Data Analysis: From Tiny Pixels to the Big Picture. Session in *Reading the Book of Life* short course; MAA MathFest, Boulder, CO (July 2003)

DNA Microarray Data Analysis. 3-day workshop on MAGIC Tool, at California State University, Sacramento, CA (June 2003)

Computational Biology short course; MAA /SIAM Southeastern Section meeting, Clemson University (March 2003)

Other invited presentations:

“You Don’t Look Like a Mathematician: Inclusion in Mathematics,” presentation in the HHMI FIRST program (March 2022)

“Beauty, Play, Truth, and Justice: How Mathematics Cultivates Human Virtues,” lecture in the *Being Human* series at Davidson College (October 2021)

Talks on data science:

- “The life cycle of a Data Science Program” panelist at MathFest (August 2021)
- “Connections and Collections: Starting an Interdisciplinary Data Science Minor at Davidson,” In Liberal Arts Collaborative for Digital Innovation workshop (June 2019) and for College of St. Johns and St. Benedict University (July 2019)

Talks on discrete mathematical models in synthetic biology:

- SIAM annual meeting (July 2017)
- Joint Mathematics Meetings (January 2017)

“How is Body Fat Regulated?”, HHMI Constellation Studio B, “Big Data, MOOCs, and Quantitative Education for Biologists (November 2015)

“Grid Proximity Graphs: LOGs, GIGs and GIRLs,” conference presentation at Canadian Conference on Computational Geometry (August 2013)

“Flips, Flops, and Genomes: A Mathematical Puzzle and its Applications,” Davidson College Inaugural King Lecture (October 2004)

“Solving a Social Problem with the Transportation Algorithm,” Special Session of MAA /SIAM Southeastern Section meeting (March 2003)

Talks on integrating mathematics and biology curricula:

- Project NExT programs at MathFest (August 2013, August 2010)
- St. Olaf College (February 2013)
- Beyond BIO2010: Celebration and Opportunities at the National Academy of Sciences (May 2010)
- AAAS annual meeting, Chicago (February 2009)
- Howard Hughes Medical Institute PI Meeting panelist (October 2006)
- TU-HHMI Interdisciplinarity Conference, Trinity University (October 2006)

Talks on bacterial computing:

- Winthrop University (June 2014)
- St. Olaf College, (February 2013)
- Ohio University (November 2011)
- RECOMB-BE satellite conference in Vienna, Austria (August 2011)
- Swarthmore College (October 2010)
- HHMI Quantitative Biology meeting at the University of Delaware (May 2010)
- University of Colorado, Boulder (July 2008)
- MAA Illinois Section meeting (April 2008)

- University of Richmond (October 2007)
- MathFest (August 2007)
- American Association of Physics Teachers conference. Davidson College (July 2007)
- Bates College (October 2006)
- DIMACS Bio-Math Connect Institute for High School Teachers, Colorado Institute of Technology (July 2006)

Talks on microarrays:

- Practicum on Constructing Learning Modules in Bioinformatics, Bates College (June 2006)
- Kenyon College (March 2005)
- MARC Special Session of the National Academy of Sciences Summer Institute, Santa Cruz, CA (January 2005)
- NITLÉ Voyage to Ithaca Conference (November 2004)
- University of Colorado, Boulder (December 2002)
- Duke University (April 2001)

Talks on bioinformatics and sequence analysis:

- North Central Section of Mathematical Association of America spring meeting (April 2006)
- SIAM Minisymposium on Education at Joint Mathematics Meetings (January 2006)
- Appalachian State University (April 2005)
- DIMACS Conference on Linking Mathematics and Biology in the High Schools (April 2005)
- MAA MathFest (August 2004)
- Hands-on Teaching of Bioinformatics, Hope College (May 2004)
- Consortium for Liberal Arts Colleges Conference, Davidson, NC (June 2005), Kenyon College, (March 2005)
- High Point University (October 2003)
- MAA MathFest (July 2003)
- Wesleyan University (June 2000)
- Davidson College (February 2000)
- Colorado College (February 2000)

Talks on gene expression cluster analysis:

- AWM Workshop, Joint Mathematics Meetings (January 2000)
- Keck Graduate Institute, (January 2000)
- Iowa State University (February 2000)
- Colorado College (February 2000)
- Macalester College (February 2000)

Talks on RNA sequence folding and alignment:

- University of California, San Diego (March 1999)
- University of Pennsylvania (April 1998)
- University of Southern California (February 1998)
- Colorado State University (December 1997)

PROFESSIONAL SERVICE

Program Reviews and Consultancies:

- Reviewer, United States Naval Academy, Computer Science and Data Science programs (March 2022)
- Reviewer, Macalester College, Computer Science Program (April 2018)
- Consultant, Applied Mathematics Department, University of Colorado, Boulder (July 2008)
- Reviewer, Trinity University HHMI and Keck grant programs (January 2007)
- Consultant, Mathematical Biology program at Bates College (October 2006)
- Consultant, Bioinformatics program at Minnesota State University, Mankato (April 2006)

Moderator, Data Science and Quantitative Skills affinity group, LACOL annual meeting (June 2021)

Participant in semester-long [Virtual Workshop on Data Science in Liberal Arts Colleges](#) (Spring 2021)

Member, Smith-Davidson Faculty Leadership Cohort Program (2020-2021)

QUBES Faculty Mentoring Network on Data in Biological Sciences (DiBS), with Malcolm Campbell and Chris Paradise (Spring 2020)

Steering committee for NSF grant: "Online modules for quantitative skill building: Exploring adaption and adoption across a consortium" (PI: Melissa Eblen-Zayas, Carleton College; 2019-present)

Participant in 3-day Crossroads workshop: "Analyzing and Understanding Systemic Racism" as part of 5-person team from Davidson (March 2019) and follow-up half-day workshop "Interrupting Scientific Racism Through More Effective Science Education" (June 2021)

Invited talks:

Presentation to Board of Visitors (February 2019)

Presentation to Parents Council (February 2019)

"The Hurt Hub@Davidson," Town of Davidson Senior Scholars lecture (February 2019)

"Math and the Genome: A Word Search Puzzle," Learning in Retirement Lecture, The Pines retirement community (April 2018)

"Living Computers," Town of Davidson Senior Scholars lecture (October 2013)

"Bringing Math to Life: Mathematical Models in Biology and Medicine," Learning in Retirement Lecture, The Pines retirement community (February 2012)

"Stepping Stones to Success in Shipping," address to Super Competition at University of North Carolina at Charlotte (March 2001)

Organized campus-wide Hackathon (Fall 2018, Fall 2019)

Green Dot Bystander Training Leadership Team (2017-present)

Tech Impact Fellowship coordinator (2017-2021)

Advise WICS (women's coding club; 2016-present)

Referee for journals:

- *Involvement: A Journal of Mathematics*
- *International Journal of Bioinformatics Research and Applications*
- *American Mathematical Monthly*
- *Proceedings of the National Academy of Sciences*
- *Journal of the American Statistical Association*
- *Journal of Computational Biology*
- *Bioinformatics*
- *Institute of Statistical Mathematics*
- *Physica D*
- *CBE – Life Science Education*
- *BMC Bioinformatics*

Paper sessions organized:

- Invited paper session, "Mathematical Questions in Bioinformatics" co-organizer, at MathFest, San Jose, CA (August 2007)
- Special Session on Mathematical Biology, MAA SE Section and SIAM SEA spring meeting (March 2006)
- Contributed paper session, "Mathematical Modeling Modules and Materials" co-organizer at MAA MathFest (July 2004)

Panel discussions at professional meetings:

- "Modeling and Calculus." M-Cast Webinar for Project MOSAIC (April 2011)
- "Creating/improving the biomathematics/biostatistics course," Panel discussion at Joint Mathematics Meetings (January 2011)
- "Primary Literature as a Hook in Applied Calculus," at Joint Mathematics Meetings (January 2009)
- "Getting Started in Mathematical Biology," at Joint Mathematics Meetings (January 2006)
- "What is Project NExT?," MAA Southeastern section meeting (March 2001)

Book proposal reviews:

- Taylor and Francis
- Jones and Bartlett
- Oxford University Press
- Cambridge University Press

Content expert and author at COMAP writer's workshops for bio-math modules for high school:

- DIMACS, Rutgers University (October 2011)
- COMAP (July 2008)
- Colorado Institute of Technology (July 2006)

- DIMACS, Rutgers University (July 2004)

Case Study Author, College Board National Science Foundation (NSF) Advance Placement Redesign Project for the AP Biology Course (July 2006)

Guest Editor for Transformations: Liberal Arts in the Digital Age special issue on Bioinformatics in the Liberal Arts (2004)

Small Group Leader at Lilly Summer Seminar for Davidson College Alumni (2006)

Panelist, Belmont-Abbey College Conference “Life of the Mind, Life of Faith: Identity, Curriculum, and Student Life in the Bible Belt” (2004)

NPR “Charlotte Talks” guest, with A. M. Campbell (2002)

Davidson Elementary Math Fair judge (2005, 2006, 2008)

Advisory committee for Joint Mathematics Board Mathematics Awareness Month (2002)

NSF grant proposal review (one panel, plus three individual proposals)