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Research Interests

I am primarily interested in the study of combinatorial and algebraic structures. In particular, I study finite geometries, distance regular graphs/association schemes, error correcting codes, and combinatorial designs, as well as permutation groups, finite fields, and semifields. I frequently use computational methods to obtain experimental data that can be used to formulate and help prove theorems.

Education

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| May 2012 | Ph.D. Applied Mathematics, University of Colorado Denver. |
| July 2011 | M.S. Applied Mathematics, University of Colorado Denver. |
| May 2005 | B.A. Mathematics, Humboldt State University. |

Work Experience

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| 2017–Present | Assistant Professor , California State University, Fresno. Department of Mathematics. |
| 2016–2017 | Visiting Assistant Professor , Lake Superior State University. School of Mathematics and Computer Science. |
| 2015–2016 | Postdoctoral researcher , University of Padova. Project: “Finite Geometry with Applications in Algebra and Geometry”. Supervisor: Michel Lavrauw. |
| 2014–2015 | Adjunct Instructor , Los Medanos College. Math Department. |
| 2013–2014 | Postdoctoral Researcher (FWO funded), Ghent University. Supervisor: Tom De Medts, main collaborator: Leo Storme. |
| 2012–2013 | Adjunct Instructor , University of Colorado Denver. Department of Mathematical and Statistical Sciences. |
| 2010–2011 | Resident Mathematician , Englewood Middle School. Funded by the NSF GK-12 Transforming Experiences grant. |
| 2007–2012 | Graduate Teaching Assistant , University of Colorado Denver. Department of Mathematical and Statistical Sciences. |

Honors, Awards & Fellowships

GK-12 Fellowship from the National Science Foundation (2010–2011). Spent the year working with 6th, 7th, and 8th grade students at Englewood Middle School as a resident mathematics expert.

Lynn Bateman Memorial Fellowship from the University of Colorado Denver, (received three times, Fall 2007, Fall 2008, Spring 2009). Provides financial support to outstanding graduate students.

Research Publications (* indicates undergraduate author)

1. Cameron–Liebler line classes with parameter $x = (q + 1)^2/3$. (in preparation) (with Tao Feng, Koji Momihara, Qing Xiang, and Hanlin Zou).
2. A family of Cameron–Liebler sets of generators in $\mathcal{Q}^+(5, q)$. (in preparation) (with Maarten De Boeck and Jozefien D’haeseleer).
3. Tight sets in Paley graphs. (In preparation) (with Emily Barranca*, Clara Buck*, and Lauren Hartmann*).
4. Cameron–Liebler sets of generators in finite classical polar spaces. *Journal of Combinatorial Theory, Series A* **167** (2019), 340–388 (with Maarten De Boeck, Leo Storme, and Andrea Švob).
5. Classification of 8-dimensional rank two commutative semifields. *Advances in Geometry*, **19** (1) (2019), 57–64 (with Michel Lavrauw).
6. Cameron–Liebler k -classes in $\text{PG}(2k + 1, q)$. *Combinatorica*, **38** (3) (2018), 739–757 (with Leo Storme and Andries Vansweevelt).
7. A new family of tight sets in $\mathcal{Q}^+(5, q)$. *Designs, Codes and Cryptography*, **78** (3) (2016), 655–678 (with Jan De Beule, Jeroen Demeyer, and Klaus Metsch).
8. Double k -sets in symplectic generalized quadrangles. *Designs, Codes and Cryptography*, **72** (2) (2014), 265–271 (with Stanley Payne).
9. Cameron–Liebler line classes. *Designs, Codes and Cryptography*, **68** (1) (2013), 33–37.

Invited Talks

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| 1 November, 2019 | Mathematics Department Colloquium, Michigan Technological University, <i>Cameron–Liebler sets in projective and polar spaces</i> |
| 26 November, 2018 | Discrete Mathematics Seminar, University of Delaware, <i>Intriguing sets in distance regular graphs</i> |
| 12 February, 2018 | Combinatorics Seminar, University of Wisconsin–Madison, <i>Cameron–Liebler sets</i> |
| 6 February, 2015 | Rocky Mountain Algebraic Combinatorics Seminar, Colorado State University, <i>A new family of Cameron–Liebler line classes</i> |
| 14 November, 2013 | Seminari di Geometria Combinatoria a Napoli, University of Naples ‘Federico II’ (IT), <i>Tight sets in $\mathcal{Q}^+(5, q)$</i> |
| 2 October, 2013 | Eindhoven Seminar Combinatorial Theory, Eindhoven University of Technology (NL), <i>Cameron–Liebler line classes</i> |
| 13 October, 2011 | Finite Geometry Seminar, Ghent University (BE), <i>Some new examples of Cameron–Liebler line classes</i> |
| 25 March, 2011 | Algebraic Combinatorics Seminar, Colorado State University (US), <i>Cameron–Liebler line classes and affine two-intersection sets</i> |

Conference Presentations

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| 21–24 August, 2019 | Finite Geometry and Extremal Combinatorics, University of Delaware (US), <i>Sets of type (m, n) in $\text{PG}(3, 9)$</i> |
| 31 January–3 February, 2019 | Finite Geometry Workshop 2019, Szeged (HU), <i>Cameron–Liebler sets in projective and polar spaces</i> |
| 10–16 September, 2017 | Finite Geometries, Fifth Irsee Conference, Irsee (DE), <i>Finite commutative semifields with small rank</i> |

- 29 May–4 June 2016 Combinatorics 2016, Maratea (IT), *Classification of 8-dimensional rank two commutative semifields*
- 4–8 April, 2016 Network Coding and Designs, CAAS Dubrovnik (HR), *Cameron–Liebler type sets and completely regular codes in Grassmann graphs*
- 17–19 September, 2015 Giornate di Geometria 2015, Second University of Naples (IT), *Cameron–Liebler type sets and completely regular codes of Grassmann graphs*
- 13–15 July, 2015 Fq12, International Conference on Finite Fields and Their Applications, Skidmore College (US), *An infinite family of tight sets in $\mathbb{Q}^+(5, q)$*
- 8–11 July, 2015 Fields-Carleton Finite Fields Workshop, Carleton University (CA), *Field reduction techniques in finite geometry*
- 14–20 September, 2014 Finite Geometries, Fourth Irsee Conference, Irsee (DE), *A new family of Cameron–Liebler line classes*
- 8 May, 2012 Rocky Mountain Discrete Math Days, Colorado State University (US), *Cameron–Liebler line classes with large cyclic stabilizer*
- 4–6 November, 2011 Algebraic Combinatorics: In Memory of Bob Liebler, Colorado State University (US), *Cameron–Liebler line classes from cyclic groups*
- 19–25 June, 2011 Finite Geometries, Third Irsee Conference, Irsee (DE), *Cameron–Liebler line classes and affine two-intersection sets*
- 9 April, 2011 MAA 2011 Rocky Mountain Section Meeting, University of Colorado Boulder (US), *Special line classes in finite projective space*
- 25–26 April, 2008 MAA 2008 Rocky Mountain Section Meeting, Black Hills State University (US), *Symplectic double-fives*

Local Presentations

- 4 October, 2019 2018 Fall Math Seminar Series, California State University, Fresno, *Two-intersection sets in the projective space $\text{PG}(3, 9)$*
- 25 February, 2019 Undergraduate Mathematics Seminar, Fresno State, *Staring down a combinatorial explosion*
- 31 August, 2018 2018 Fall Math Seminar Series, California State University, Fresno, *Eigenvalue techniques in graph theory and combinatorics*
- 27 October, 2017 Undergraduate Mathematics Seminar, California State University, Fresno, *Permutation groups and symmetric block designs*
- 3 February, 2017 Math Colloquium Series, California State University, Fresno, *Special line sets in projective space*
- 6 December, 2013 Seminars on Incidence Geometry, Ghent University (BE), *Cameron–Liebler type sets of k -spaces*
- 5 October 5, 2009 Discrete Math Seminar, University of Colorado Denver (US), *Let's talk biplanes*
- 6 October, 2008 Discrete Math Seminar, University of Colorado Denver (US), *Factoring large numbers using algebraic number fields*

Research Visits

- 5–13 September 2014 Ghent University. Collaborated with Jan de Beule.
- 16–24 November 2013 University of Padova. Collaborated with Michel Lavrauw.
- 1–16 October 2011 Ghent University. Collaborated with Jan de Beule.

Teaching Experience (graduate courses in bold)

California State University, Fresno, Department of Mathematics

Modern Algebra II (Fall 2019)

Perspectives in Algebra (Fall 2017)

Coding Theory (Fall 2018)

CSU Fresno REU Program (Summer 2018)

Graph Theory (Spring 2018)

Number Theory (Fall 2018, Spring 2019)

Linear Algebra (Spring 2018)

Calculus I (Fall 2017)

Graduate students supervised

AJ Vogt, M.S. May 2019

Lake Superior State University, School of Mathematics and Computer Sciences

Calculus I (Spring 2017)

College Algebra (Fall 2016)

Intermediate Algebra (Fall 2016, Spring 2017)

Beginning Algebra (Fall 2016)

Los Medanos College, Department of Mathematics

Introduction to Statistics (Spring 2015)

Precalculus (Fall 2014, Spring 2015)

Intermediate Algebra (Fall 2014)

University of Colorado Denver, Department of Mathematical and Statistical Sciences

Introduction to Modern Algebra (Summer 2012)

Linear Algebra and Differential Equations (Spring 2010, Spring 2012, Spring 2013)

Applied Linear Algebra (Summer 2008, Summer 2010)

Introduction to Abstract Mathematics (Fall 2012, Spring 2013)

Calculus II (Summer 2009)

Calculus I (Fall 2011)

Polynomial Calculus (Spring 2008)

College Algebra (Fall 2012)

Service

University Committees

College of Science and Math Budget and Space Committee (2018–)

Mathematics Department Assessment Committee (2019–)

Mathematics Department Catalog & Curriculum Committee (2019–)

Mathematics Department Articulation Committee (2018–)

Mathematics Department Software Committee (Fall 2018)

Mathematics Department Graduate Committee (2017–)

Reviewing

Designs Codes and Cryptography

Discrete Mathematics