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I am a chemistry and physics educator and course director at the USAFA Preparatory School and president of the Colorado Springs School District 11 Board of Education. In the classroom, I emphasize clear explanations, individual practice, frequent retrieval, and spaced repetition to build durable knowledge and independent mastery. My School Board work focuses on education policy, governance, and accountability. I also build software through AI-assisted coding, testing it against real tasks with an emphasis on practical applications.

Education and Certification

Ph.D., Chemistry , University of Colorado – Boulder	May 2018
Supervisor: Professor Niels Damrauer Doctoral Thesis: “Development of a Modular Synthesis of Rigid Polyacene Dimers for Mechanistic Exploration of Singlet Fission”	
Appreciative Advising Certificate , Florida Atlantic University	Spring 2023
Dean’s Teaching Certificate , United States Air Force Academy	Spring 2019
Certificate in College Teaching , University of Colorado – Boulder	May 2018
B.S., Chemistry , University of Wisconsin – Madison	May 2012
Honors Thesis: “Computational Mechanistic Analysis of Visible Light-promoted [2+2] Enone Cycloadditions”	

Teaching and Work Experience

Command Instructor of Science , USAFA Preparatory School	Jul 2019–Present
<i>40 hours/week AD-1701-23</i>	
Prep School courses: Introductory General Chemistry; Introductory Physics; Preflight (College Success and Study Skills).	
<ul style="list-style-type: none">• Teach chemistry and physics with an emphasis on first-principles reasoning, quantitative problem solving, and laboratory work; develop lessons, assessments, and instructional materials and advise cadet candidates on Academy readiness.• Course-directed Introductory Organic Chemistry (CHEM 230, Fall 2022) and guest-taught Organic Chemistry Laboratory (CHEM 243, Spring 2025) at USAFA.• Course-directed regular-track Science (SCI) 143 and SCI 144, coordinating instructors and assessments for the full Prep School cohort of approximately 200 cadet candidates. In Spring 2023, simultaneously directed SCI 144 and taught a pilot study physics course.• Course-direct SCI 132 Skills Chemistry for approximately 25–30 cadet candidates with the greatest academic need; previously directed SCI 134 Skills Track. Reworked instruction around explicit explanation, guided practice, frequent retrieval, and spaced repetition. Following the redesign, final-exam averages across two cohorts were nearly twelve percentage points higher than across the preceding three cohorts on similar exams.• Use frequent checks for understanding and prompt extra instruction to address gaps. Hands-on practical examinations assess students’ independent execution of complex, multi-step tasks; approximately 80% of the course grade comes from supervised individual work; the remaining 20% is homework.	

Board President and Director, Colorado Springs School District 11

Dec 2023–Present

Board President since Dec 2025 | Approximately 15–20 hours/week

- Chair the seven-member elected Board of a district serving over 23,000 students across approximately 60 schools. Set policy and strategic priorities, oversee the superintendent, and authorize a General Fund operating budget of approximately \$353 million (FY 2026–27).
- Lead public meetings, agenda planning, and policy work sessions; coordinate Board deliberations with fellow directors and district leadership.
- Help set academic priorities and performance goals focused on student achievement, teacher practice, and public measures of progress; evaluate the superintendent against Board-adopted expectations.
- Oversee a systematic review of district policy and work with families, educators, administrators, and community members on public education and governance decisions.
- Write and speak publicly about school governance, academic standards, and education policy.

Visiting Assistant Professor, Adams State University

Aug 2018–May 2019

40 hours/week | Full-time academic appointment

Courses: Introduction to General, Organic, and Biochemistry; Organic Chemistry I; Introductory Chemistry; Inorganic Chemistry. All included a full corresponding laboratory course.

- Designed and taught lectures, assessments, and laboratory activities across introductory, organic, and inorganic chemistry courses.
- Supervised four weekly laboratory sections and undergraduate teaching assistants; participated in junior-faculty mentoring and classroom observations.

Teaching Assistant, University of Colorado – Boulder

Aug 2012–May 2018

Approximately 20 hours/week teaching; concurrent with doctoral research

Courses: Organic Chemistry I and II; Organic Chemistry I and II for Majors, including laboratories.

- Held a teaching assignment every semester of doctoral study, taught laboratory sections, guest-lectured to classes of up to 200 students, and supervised undergraduate laboratory research; participated in the Graduate Teacher Program and earned teaching recognition.

Department Tutor, University of Colorado – Boulder

Aug 2012–May 2018

Approximately 5 hours/week; concurrent with graduate appointments

- Supported students in undergraduate chemistry alongside teaching and research responsibilities.

Academic Coach, Center for Educational Opportunity

Aug 2010–May 2012

Approximately 10–20 hours/week

- Tutored first-generation college students in general and organic chemistry.

Applied AI and Software Projects

Project Portfolio: <https://thomas-carey-portfolio-911277083046.us-central1.run.app/>

Instructional applications

- **AI in instructional practice.** Use AI to develop targeted chemistry practice, check learning objectives against assignments, validate calculations and answer keys, and audit course materials. I review the instructional and scientific accuracy of the outputs.

Board and administrative applications

- **Project Arete.** Built a policy review application for D11 Board work, bringing source documents, version comparisons, discussion notes, decisions, and review timelines into one place.
- **Work Session Visualizer.** Built an interactive tool for collecting directors' discussion requests, allocating meeting time, recording next steps, and exporting an editable Word summary.
- **Policy document automation.** Built tools for matching and comparing policy drafts, producing redlined PDFs, and assembling a linked, editable policy manual from hundreds of source files.
- **Meeting transcript workflow.** Developed transcript-based chapter markers and review pages so board-office staff can check and enter accurate meeting timestamps.
- **Mileage reporting.** Built a reimbursement tool that uses the Google Maps API for route mileage and map retrieval, generating PDF and spreadsheet reporting forms.

Independent projects

- **Policy Explorer.** Built a personal policy analysis app using a multi-agent LLM workflow for statutory and risk analysis, governance classification, and adversarial review with a correction loop.
- **Project Excelsior.** Developed a fitness and training app with workout histories, progression based on completed lifts, and AI coaching through a language-model API using the user's logged training data.

Academic Leadership and Service

Faculty Leadership and Development, USAFA Preparatory School

2019–Present

- Led the Academic Advising Program for cadet candidates in 2025–2026; developed four rounds of common lessons and trained new faculty advisors.
- Designed and directed New Staff Immersion, the Prep School's onboarding program, in 2024–2025; welcomed approximately 15 civilian and military personnel across academic, military, and athletic programs in 2024. Advised the 2026 organizers.
- Helped develop Prep School AI-use guidance and delivered the science portion of a student briefing on responsible academic use.
- Mentor newer military instructors through shared materials, lesson observation, and feedback on teaching, laboratory work, and cadet support.
- Led faculty workshops on Small Teaching and effective online instruction; worked with English faculty to improve shared standards for laboratory reports.
- Led the rope-climb station in integrated training exercises in 2024–2026; supported cadet fitness and climbing activities and mentored alumni transitioning to USAFA.
- Serve as a sponsor parent for USAFA cadets.

Faculty and Community Outreach, Adams State University

Aug 2018–May 2019

- Supported chemistry majors through seminar feedback and community-building activities and presented demonstrations at the annual Chemistry Magic Show.

Chemistry Demonstrator, Volunteer, UW–Madison

Aug 2010–May 2012

- Demonstrated chemistry experiments for children at community libraries and schools.

Research Experience

Research Assistant, University of Colorado Boulder

Aug 2012–May 2018

Approximately 55 hours/week research; concurrent with ~20-hour/week teaching assignment

- Designed and conducted organic syntheses of rigid polyacene dimers to study singlet fission and related photophysical questions.
- Used NMR, UV–Vis and IR spectroscopy, chromatography, crystallization, and air- and moisture-sensitive techniques; served as laboratory safety coordinator.

Undergraduate Research Assistant, UW–Madison

Sep 2011–Jun 2012

Approximately 5–10 hours/week | Research advisor: Professor Clark Landis

- Investigated photochemical reaction mechanisms using computational methods, including density functional theory (DFT).

Undergraduate Research Assistant, UW–Madison

Jan 2011–May 2011

Approximately 5–10 hours/week | Research advisor: Professor Tehshik Yoon

- Optimized photochemical reactions during development of a heterogeneous catalyst.

Publications and Presentations

“Modular Synthesis of Rigid Polyacene Dimers for Singlet Fission” **Carey, T.**, Miller, E., Gilligan, A., Sammakia, T., Damrauer, N. *Organic Letters* **2018**, 20, 457-460 DOI: [10.1021/acs.orglett.7b03817](https://doi.org/10.1021/acs.orglett.7b03817)

“Solvent-Controlled Branching of Localized versus Delocalized Singlet Exciton States and Equilibration with Charge Transfer in a Structurally Well-Defined Tetracene Dimer” Cook, J., **Carey, T.**, Arias, D., Johnson, J., Damrauer, N. *Journal of Physical Chemistry A* **2017**, 121, 9229-9242 DOI: [10.1021/acs.jpca.7b09458](https://doi.org/10.1021/acs.jpca.7b09458)

“Synthesis of Geometrically Well-Defined Covalent Acene Dimers for Mechanistic Exploration of Singlet Fission” **Carey, T.**, Snyder, J., Miller, E., Sammakia, T., Damrauer, N. *Journal of Organic Chemistry* **2017**, 82, 4866-4874 DOI: [10.1021/acs.joc.7b00602](https://doi.org/10.1021/acs.joc.7b00602)

“Solution-Phase Singlet Fission in a Structurally Well-Defined Norbornyl-Bridged Tetracene Dimer.” Cook, J., **Carey, T.**, Damrauer, N. *Journal of Physical Chemistry A* **2016**, 120, 4473-4481 DOI: [10.1021/acs.jpca.6b04367](https://doi.org/10.1021/acs.jpca.6b04367)

Speaker at the Singlet Fission Workshop

June 2017

“Optimization of a Modular Synthesis of Rigid Polyacene Dimers”

Poster Presenter at the Singlet Fission Workshop

June 2014–2017

2017: “Exploring Rigid Dimers of Polyacene-based Materials for Singlet Fission”

2016: “Structurally Well-defined Covalent Tetracene-based Dimers for Singlet Fission”

2015: “Exploring Covalent Dimers of Tetracene-based Materials for Singlet Fission”

2014: “Understanding, Control, and Optimization of Singlet Fission in Tetracene-based Materials”

Honors and Awards

Civilian Cat II of the Year For outstanding mission contributions to the USAFA Preparatory School	2026
Instructor of the Semester For excellence in instruction at the USAFA Preparatory School	Spring 2024
Emerging Ally Award – Society of Women Engineers (National Winner) For an unwavering commitment to supporting female co-workers and developing female students	2024
General Larry O. Spencer Innovation Award For a multitude of improvements across the USAFA Preparatory School mission	2023
Two-time Commander’s Coin Recipient, United States Air Force Academy For furthering the mission of the USAFA Preparatory School	2023 and 2021
Dr. Ronald Furstenau Award Presented for selfless and dedicated service in chemistry education	2023
1st Quarter Award, United States Air Force Academy For furthering the mission of the USAFA Preparatory School and excellence in teaching and mentorship	2022
Outstanding Academy Educator, United States Air Force Academy For excellence in teaching in the USAFA ecosystem and fostering leaders of character	2021
Award for Exemplary Civilian Service, United States Air Force Academy For distinguished performance during the COVID-19 evacuation effort	2020
Patty Feist Teaching Award, University of Colorado – Boulder For excellence in teaching undergraduate laboratories	2017
Eugene Huffman Memorial Scholarship, University of Colorado – Boulder For excellence in research and academics	2016
John S. Meek Teaching Award, University of Colorado – Boulder For excellence in teaching	2012