

SUMMARY

Synthetic main group chemist with documented experience in designing, conducting, and securing funding for research with undergraduate students, and in employing innovative pedagogical approaches to teaching college-level organic chemistry courses.

PROFESSIONAL APPOINTMENTS

Chapman University, Orange, CA

Assistant Professor of Chemistry

2018 – Present

Research: Main group catalysis for sustainable organic and polymer synthesis

Teaching: Organic chemistry

California Institute of Technology, Pasadena, CA

Resnick Sustainability Institute Postdoctoral Fellow

2016 – 2018

Research: Brush polymers as stimuli-responsive photonic crystals

Mentor: Prof. Robert H. Grubbs

EDUCATION

University of California, Berkeley

Ph.D. in Chemistry

2010 – 2015

Dissertation: Lewis Acid Mediated Reactions: Electronic Modification of Platinum Complexes and Metal-Free Catalysis

Mentors: Profs. T. Don Tilley and Robert G. Bergman

Scripps College

B.A. in Chemistry, summa cum laude with honors in Chemistry

2006 – 2010

Thesis: Aryl Orientation Preferences During Reductive Elimination from Platinum

Mentors: Profs. Nancy S. B. Williams and Kathleen L. Purvis-Roberts

PUBLICATIONS

Undergraduate researchers underlined

‡ = equal contribution

* = corresponding author

With Chapman University Affiliation:

23. Robertson, H. J.; Fujiwara, M. N.; **Liberman-Martin, A. L.*** Group 14 Metallocene Catalysts for Carbonyl Hydroboration and Cyanosilylation. submitted to *Polyhedron* in October 2023 (invited contribution to a special issue of “Emerging Investigators”). <https://doi.org/10.26434/chemrxiv-2023-svjfl>
22. Janda, B. A.; Tran, J. A.; Chang, D. K.; Nerhood, G. C.; Ogba, O. M.;* **Liberman-Martin, A. L.*** Carbodiimide and Isocyanate Hydroboration by a Cyclic Carbodiphosphorane Catalyst. *Chem. Eur. J.* **2023**, Accepted Article. (invited contribution to the “Chemistry of the p-Block Elements” special collection). <https://doi.org/10.1002/chem.202303095>
 - Highlighted on the *ChemistryViews* website: <https://www.chemistryviews.org/hydroborations-using-a-cyclic-carbodiphosphorane-catalyst/>
21. **Liberman-Martin, A. L.*** The Emergence of Zerovalent Carbon Compounds from Structural Curiosities to Organocatalysts. *Cell Rep. Phys. Sci.* **2023**, 4, 101519. (invited Perspective article) <https://doi.org/10.1016/j.xcrp.2023.101519>
20. **Liberman-Martin, A. L.*** Ruthenium Olefin Metathesis Catalysts Featuring Chelating Benzylidene-Triazole Ligands. *Chem Catalysis* **2023**, 3, 100725. (invited Preview article) <https://doi.org/10.1016/j.checat.2023.100725>

19. **Lieberman-Martin, A. L.**;† van Vleet, M. J.;† Elenberger, T.; Cave, R. J.; Williams, N. S. B. Geometric Control of Carbon–Carbon Reductive Elimination from a Platinum(IV) Pincer Complex. *Organometallics* **2022**, *41*, 3104–3108. (special issue on “Organometallic Chemistry Inspired by Maurice Brookhart”) <https://doi.org/10.1021/acs.organomet.2c00282>
18. **Aversa-Fleener, C. R.**; Chang, D. K.; **Lieberman-Martin, A. L.*** Carbodiphosphorane-Catalyzed Hydroboration of Ketones and Imines. *Organometallics* **2021**, *40*, 4050–4054. <https://doi.org/10.1021/acs.organomet.1c00628>
 - Highlighted in the “Out in Inorganic Chemistry: A Celebration of LGBTQIAPN+ Inorganic Chemists” virtual issue of *Inorganic Chemistry*
 - A “Most Read” article from December 2021–February 2022 on the *Organometallics* website
17. **Lieberman-Martin, A. L.**;*† Chang, A. B.;† Chu, C. K.; Siddique, R. H.; Lee, B.;* Grubbs, R. H.* Processing Effects on the Self-Assembly of Brush Block Polymer Photonic Crystals. *ACS Macro Letters*, **2021**, *10*, 1480–1486. <https://doi.org/10.1021/acsmacrolett.1c00579>
 - A “Most Read” article from November–December 2021 on the *ACS Macro Letters* website
16. Naumann, R. A.; Ziller, J. W.; **Lieberman-Martin, A. L.*** Crystal Structure of 2-(2,6-diisopropylbenzene)-*N,N*-diethyl-3,3-dimethyl-2-azaspiro[4.5]decan-1-amine: A Diethylamine Adduct of a Cyclic(Alkyl)(Amino)Carbene (CAAC). *Acta Crystallogr.* **2021**, *E77*, 903–906. <https://doi.org/10.1107/S2056989021007854>
15. **Lieberman-Martin, A. L.**;*† Ogba, O. M.*† Midsemester Transition to Remote Instruction in a Flipped College-Level Organic Chemistry Course. *J. Chem. Educ.* **2020**, *97*, 3188–3193. (special issue on “Insights Gained While Teaching Chemistry in the Time of COVID-19”) <https://doi.org/10.1021/acs.jchemed.0c00632>

From Prior Training:

14. Chu, C. K.; Lin, T.-P.; Shao, H.; **Lieberman-Martin, A. L.**; Liu, P.; Grubbs, R. H. Disentangling Ligand Effects on Metathesis Catalyst Activity: Experimental and Computational Studies of Ruthenium–Aminophosphine Complexes. *J. Am. Chem. Soc.* **2018**, *140*, 5634–5643. <https://doi.org/10.1021/jacs.8b02324>
13. **Lieberman-Martin, A. L.**; Grubbs, R. H. Ruthenium Olefin Metathesis Catalysts Featuring a Labile Carbodicarbene Ligand. *Organometallics* **2017**, *36*, 4091–4094. <https://doi.org/10.1021/acs.organomet.7b00615>
12. **Lieberman-Martin, A. L.**; Chu, C. K.; Grubbs, R. H. Application of Bottlebrush Block Copolymers as Photonic Crystals. *Macromol. Rapid Commun.* **2017**, 1700058. (special issue on “Polymers and Light”) <https://doi.org/10.1002/marc.201700058>
11. Chang, A. B.; Lin, T.-P.; Thompson, N. B.; Luo, S.-X.; **Lieberman-Martin, A. L.**; Chen, H.-Y.; Lee, B.; Grubbs, R. H. Design, Synthesis, and Self-Assembly of Polymers with Tailored Graft Distributions. *J. Am. Chem. Soc.* **2017**, *139*, 17683–17693. <https://doi.org/10.1021/jacs.7b10525>
10. Lin, T.-P.; Chang, A. B.; Chen, H.-Y.; **Lieberman-Martin, A. L.**; Bates, C. M.; Voegtle, M.; Bauer, C. A.; Grubbs, R. H. Control of Grafting Density and Distribution in Graft Polymers by Living Ring-Opening Metathesis Copolymerization. *J. Am. Chem. Soc.* **2017**, *139*, 3896–3903. <https://doi.org/10.1021/jacs.7b00791>
9. Suslick, B. A.; **Lieberman-Martin, A. L.**; Wambach, T. C.; Tilley, T. D. Olefin Hydroarylation Catalyzed by (Pyridyl-Indolate)Pt(II) Complexes: Catalytic Efficiencies and Mechanistic Aspects, *ACS Catal.*, **2017**, *7*, 4313–4322. <https://doi.org/10.1021/acscatal.7b01560>
8. Lipke, M. C.; **Lieberman-Martin, A. L.**; Tilley, T. D. Electrophilic Activation of Silicon–Hydrogen Bonds in Catalytic Hydrosilations. *Angew. Chem., Int. Ed.* **2017**, *56*, 2260–2294. <https://doi.org/10.1002/anie.201605198>
7. **Lieberman-Martin, A. L.**; Levine, D. S.; Ziegler, M. S.; Bergman, R. G.; Tilley, T. D. Lewis Acid-Base Interactions between Platinum(II) Diaryl Complexes and Bis(Perfluorophenyl)Zinc: Strongly Accelerated Reductive Elimination Induced by a Z-Type Ligand. *Chem. Commun.* **2016**, *52*, 7039–7042. <https://doi.org/10.1039/C6CC02433E>
6. Lipke, M. C.; **Lieberman-Martin, A. L.**; Tilley, T. D. Significant Cooperativity Between Ruthenium and Silicon in Catalytic Transformations of an Isocyanide. *J. Am. Chem. Soc.* **2016**, *138*, 9704–9713. <https://doi.org/10.1021/jacs.6b05736>
5. **Lieberman-Martin, A. L.**; Ziegler, M. S.; DiPasquale, A. G.; Bergman, R. G.; Tilley, T. D. Functionalization of an Iridium–Diamidocarbene Complex by Ligand-Based Reactions with Titanocene and Zirconocene Sources. *Polyhedron* **2016**, *116*, 111–115. (special issue dedicated to Malcolm L. H. Green) <https://doi.org/10.1016/j.poly.2016.03.044>
4. **Lieberman-Martin, A. L.**; Levine, D. S.; Liu, W.; Bergman, R. G.; Tilley, T. D. Biaryl Reductive Elimination Is Dramatically Accelerated by Remote Lewis Acid Binding to a 2,2'-Bipyrimidyl–Platinum Complex: Evidence for

- a Bidentate Ligand Dissociation Mechanism. *Organometallics* **2016**, *35*, 1064–1069. <https://doi.org/10.1021/acs.organomet.5b01003>
3. **Lieberman-Martin, A. L.**; Bergman, R. G.; Tilley, T. D. Lewis Acidity of Bis(Perfluorocatecholato)Silane: Aldehyde Hydrosilylation Catalyzed by a Neutral Silicon Compound. *J. Am. Chem. Soc.* **2015**, *137*, 5328–5331. <https://doi.org/10.1021/jacs.5b02807>
 2. **Lieberman-Martin, A. L.**; Bergman, R. G.; Tilley, T. D. A Remote Lewis Acid Trigger Dramatically Accelerates Biaryl Reductive Elimination from a Platinum Complex. *J. Am. Chem. Soc.* **2013**, *135*, 9612–9615. <https://doi.org/10.1021/ja404339u>
 1. Erupe, M. E.; **Lieberman-Martin, A. L.**; Silva, P. J.; Malloy, Q. G. J.; Yonis, N.; Crocker, D. R.; Purvis-Roberts, K. L. Determination of Methylamines and Trimethylamine-N-oxide in Particulate Matter by Non-Suppressed Ion Chromatography. *J. Chromatogr. A.* **2010**, *1217*, 2070–2073. <https://doi.org/10.1016/j.chroma.2010.01.066>

SELECT HONORS AND AWARDS

At Chapman University

- Cottrell Scholar Award (2023)
- Valerie Scudder Award (2023)
Recognition of outstanding achievement in teaching, scholarly/creative activity, and service to Chapman
- American Chemical Society Division of Inorganic Chemistry Award For Undergraduate Research (2022)
Collaborative award with undergraduate researcher Ben Janda

At Caltech

- Resnick Sustainability Institute Postdoctoral Fellowship (2016 – 2018)
- Outstanding Poster Award, Division of Polymer Chemistry, ACS National Meeting (2017)

At UC Berkeley

- Benjamin Bousert Memorial Award, UC Berkeley, Department of Chemistry (2016)
Award for exemplifying commitment to social or environmental change

At Scripps College

- Barbara McClintock Award for Best Senior Thesis in the Sciences (2010)

GRANTS

External Support (\$407,421 total)

5. **Lieberman-Martin, A. L. (PI)** Broadening Applications of the Weakly Coordinating Triflimidate Anion in Main Group Catalysis. *Research Corporation for Science Advancement, Cottrell Scholar Award*; 2023–2026; \$100,000.
4. **Lieberman-Martin, A. L. (PI)** LEAPS-MPS: Development of Carbodiphosphorane Catalysts for Organic and Polymer Synthesis. *National Science Foundation Launching Early-Career Academic Pathways in the Mathematical and Physical Sciences (LEAPS-MPS)*; 2022–2024; \$235,421.
3. **Lieberman-Martin, A. L. (PI)** Carbodiphosphoranes as Organocatalysts for Carbodiimide and Isocyanate Reduction. *American Chemical Society Petroleum Research Fund, Undergraduate New Investigator Program*; 2021–2023; \$55,000.
2. **Lieberman-Martin, A. L. (PI)** Synthesis and Catalytic Applications of Carbodiphosphoranes. *Organic Syntheses Summer Research Grant for Faculty at Principally Undergraduate Institutions*; 2021–2024; \$16,000.
1. **Lieberman-Martin, A. L. (PI)** Hamilton Syringe Grant; 2019; \$1,000.

Internal Grants from Chapman University (\$25,000 total)

3. **Lieberman-Martin, A. L. (PI)** Development of a Concept Video Library and Class Demonstrations for an Advanced Organic Chemistry Course. *Chapman Pedagogical Innovation Award and Grant*; 2020–2021; \$5,000.
2. **Lieberman-Martin, A. L. (PI)** Chapman University Faculty Opportunity Fund Grant; 2019–2021; \$15,000.

1. **Lieberman-Martin, A. L. (PI)** Chapman Grant Writers Bootcamp Grant; 2019–2021; \$5,000.

External Proposals Under Consideration

1. Ogba, O. M. (PI); **Lieberman-Martin, A. L. (co-PI)** Reactivity of Lewis Acidic Salts Toward Facilitating Fluoride Bond Activation Reactions. *National Science Foundation*; total cost: \$377,970; co-PI contribution: \$71,772.

TEACHING EXPERIENCE

Chapman University

CHEM 230: Organic Chemistry I	Student Eval Average: 4.69/5.00	2018 – 2023
CHEM 331: Organic Chemistry II	Student Eval Average: 4.73/5.00	2019 – 2023
CHEM 230L: Organic Chemistry I Lab	Student Eval Average: 4.80/5.00	2018, 2019
CHEM 331L: Organic Chemistry II Lab	Student Eval Average: 4.95/5.00	2019
CHEM 432: Advanced Organic Chemistry	Student Eval Average: 4.97/5.00	2020, 2022

Chapman University Student Eval Average: 4.37/5.00

Schmid College of Science and Technology Student Eval Average: 4.23/5.00

Caltech (as Instructor of Record)

CHEM 101: Revolutionary Inorganic Molecules	2016
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University of California, Berkeley (as Graduate Student Instructor)

Organometallic Chemistry (with Prof. T. Don Tilley)	2011, 2015
NMR Spectroscopy (with Dr. Chris Canlas)	2013
Physical Organic Chemistry (with Prof. Robert G. Bergman)	2012
General Chemistry (with Prof. John Arnold)	2010

PRESENTATIONS WITH CHAPMAN UNIVERSITY AFFILIATION

UPCOMING INVITED TALK: Carbodiphosphorane Organocatalysis and Donor Properties. **Lieberman-Martin, A. L.** American Chemical Society National Meeting, New Orleans, LA, March 2024. (“Undergraduate Research at the Frontiers of Inorganic Chemistry” Symposium).

CONTRIBUTED TALK: Zerovalent Carbon Catalysts for the Reduction of C=O and C=N Bonds. **Lieberman-Martin, A. L.** American Chemical Society National Meeting, San Francisco, CA, August 2023.

INVITED TALK: Catalytic Activity of Zerovalent Carbon Compounds. **Lieberman-Martin, A. L.** Organometallics Gordon Research Conference, Newport, RI, July 2023.

INVITED TALK: Carbodiphosphoranes as Organocatalysts for Hydroboration and Hydrosilylation Reactions. **Lieberman-Martin, A. L.** American Chemical Society National Meeting, San Diego, CA, March 2022. (Phosphorus Chemistry Symposium)

INVITED TALK: Nucleophilic Carbon Catalysts for Organic and Polymer Synthesis. Chemistry Department Seminar. **Lieberman-Martin, A. L.**, Reed College, March 2022.

INVITED TALK: Nucleophilic Carbon Catalysts for Organic and Polymer Synthesis. **Lieberman-Martin, A. L.** Chemistry Seminar, Montclair State University, November 2021.

INVITED TALK: **Lieberman-Martin, A. L.** Main Group Catalysts for Organic and Polymer Synthesis. Chemistry Department Seminar, Virtual Science Nights (intercollegiate seminar series between University of San Diego, Gonzaga University, Metropolitan State University of Denver, Point Loma Nazarene University, LaSierra University, and Chapman University), March 2021.

INVITED TALK: Main Group Catalysts for Organic and Polymer Synthesis. **Lieberman-Martin, A. L.** Chemistry Department Seminar, Cleveland State University, January 2021.

INVITED TALK: Metal-Free Catalysts for Organic and Polymer Synthesis. **Lieberman-Martin A. L.** Schmid Science Forum, Chapman University, November 2020.

CONTRIBUTED POSTER: Hydroboration by a Cyclic Carbodiphosphorane Organocatalyst. **Lieberman-Martin, A. L.** Organometallics Gordon Research Conference, Newport, RI, July 2019.

PROFESSIONAL SERVICE AND OUTREACH

Service to the Chemistry Profession and Broader Community

Ad hoc manuscript reviewer:	2018 – Present
<i>CHEM, Chem Catalysis, Chemical Communications, Chemical Science, Dalton Transactions, Green Chemistry, Organic and Biomolecular Chemistry, Journal of the American Chemical Society, Journal of Chemical Education</i>	
Ad hoc grant proposal reviewer	2021 – Present
American Chemical Society Petroleum Research Fund (Polymer Science panel)	2023
Army Research Office – Materials Design Program	2022
National Science Foundation – Chemical Catalysis Program	2021, 2022, 2023
M. J. Murdock Charitable Trust – Murdock College Research Program for Natural Sciences	2022
Beckman Scholars Program Advisory Panel	2022
Facilitator – ACS “Postdoc to Faculty” workshop	2022
Led a session on “Inclusive Teaching Methods”	2022
Presider – <i>Phosphorus Chemistry Symposium</i> , ACS National Meeting	2022
Panelist – Caltech panel on “Demystifying the Research Statement”	2020
Speaker – UC Berkeley Science, Leadership, and Management Seminar Series “Mentoring and Working with Undergraduates”	2019
Judge – California Junior Science and Humanities Symposium	2019

Service to the Chapman University Community

Member, Search Committees (4):	2019 – Present
Instructional Assistant Professor of Chemistry (3); Assistant Professor of Mathematics (1)	
Member, Chemistry and Biochemistry Program Committees (2):	2023 – Present
Curriculum Alignment Committee; Chemistry & Biochemistry Seminar Series	
Chemistry and Biochemistry Program Working Groups (3):	2018 – 2023
Macromolecular Curriculum (chair); ACS Chemistry Exit Exam (member); Organic Chemistry Curriculum Development (member)	
Advisory Board Member, Chapman Tutoring and Learning Center	2021 – Present
Member, Academic Integrity Committee	2021 – 2023
Member, Chapman Beckman Scholars Selection Committee	2021, 2023
Panelist, Chapman STEM Grant Writers Bootcamp “Successful Grantees” Panel	2023
Discussion Leader (2):	
“Flipped Classrooms” roundtable within Schmid College	2020
“Pathway to a PhD in Science” discussion with the Chapman Tribeta Biological Honor Society	2018

At Caltech

Panelist, Caltech Project for Effective Teaching “Interviewing for Faculty Positions” panel	2018
Member, Caltech Teaching Conference Organizing Committee	2017
Facilitated session on “Authoring Problem Sets and Exams”	
Presider – <i>New Synthesis and Characterization of Polymers</i> , ACS National Meeting	2017
Mentor, Women Mentoring Women Program	2016 – 2018

At UC Berkeley

Student Chair, Chemical Science Division Catalysis Group, Lawrence Berkeley
National Laboratory

2013 – 2015

Organized a monthly interdisciplinary seminar series

Classroom Volunteer, Bay Area Scientists in Schools

2010 – 2015

“Be a Scientist” program mentoring 7th grade students’ scientific investigations
over a two-month period

RESEARCH ADVISEES AT CHAPMAN UNIVERSITY

Undergraduate Researchers

	Advisee	Timeline	Awards/Recognitions	Post-Chapman
18	Melia Hernandez B.S., Chem. '26	2023 –		
17	Mallory Fujiwara B.S., Biochem. '25	2023 –		
16	Mia Lee B.S., Chem. '25	2023 –		
15	Mac Nelson B.S., Biochem. '24	2023 –		
14	An Dang B.S., Biochem. '24	2022 –		
13	Gabby Montgomery B.S., Chem. '24	2023 –		
12	Julie Tran B.S., Biochem. '24	2022 –		
11	Ben Janda B.S., Chem. '23	2021 – 2023	Goldwater Scholar, Beckman Scholar, ACS Division of Inorganic Chemistry Award for Undergraduate Research, National Organic Chemistry Symposium Poster Award Winner, Chevron Award (Chapman’s highest undergraduate honor), Outstanding Senior in Chemistry	UCLA (Ph.D. Chem.)
10	Haley Robertson B.S., Chem. '23	2021 – 2023		
9	Alexa Wilson B.S., Chem. '23	2020 – 2022		
8	Tamara Elenberger B.S., Biochem. '22	2020 – 2021		Research Assistant, PhageTech
7	Liam Sullivan B.S., Chem. '22	2020 – 2022	ACS Senior Leadership Award	Cal. Poly. Pomona (M.S. Chem.)
6	Biyu (Chelsea) Zhao B.S., Chem. '22	2022	ACS Undergraduate Award in Organic Chem.	Colorado State Univ. (Ph.D. Chem.)
5	Vanna Kizirian B.S., Chem. '22	2020 – 2021		Food Scientist, Honey Pot Meadery
4	Roxanne Naumann B.S., Chem. '21	2019 – 2021	Outstanding Senior in Chemistry	UC - San Diego (Ph.D. Chem.)
3	Cara Aversa-Fleener B.S., Biochem. '21	2019 – 2021		Emergency Medical Technician
2	Ali Mahmoud	2020		Univ. Washington (B.S.Ch.E. in Chemical Engineering)

	Advisee	Timeline	Awards/Recognitions	Post-Chapman
1	Daniel Chang B.S., Chem. '19	2018 – 2020	NSF GRFP recipient, Ronald M. Huntington Award (Chapman award for research accomplishments), Outstanding Senior in Chemistry	California Institute of Technology (M.S.); Software Engineer

Teacher-Scholar Postdoctoral Fellow

	Advisee	Timeline	Post-Chapman
1	Zach Thammavongsy	2019 – 2022	Asst. Prof. of Chem., Santiago Canyon College

High School Researchers

	Advisee	Timeline
4	Alberto Alvalos	Spring 2023
3	Joshua Martinez	Spring 2023
2	Evangelina Ocampo	Spring 2022
1	Alexa Tellez-Barajas	Spring 2023