

Allegra L. Liberman-Martin

Assistant Professor of Chemistry and Biochemistry Chapman University

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Pronouns: they/them/theirs

Professional Appointments

Chapman University, Orange, CA 2018 – present

Assistant Professor of Chemistry & Biochemistry

Main Group Catalysis for Sustainable Organic and Polymer Synthesis

California Institute of Technology, Pasadena, CA 2016 – 2018

Resnick Sustainability Institute postdoctoral fellow

with Prof. Robert H. Grubbs

Investigation of Brush Polymers as Stimuli-Responsive Photonic Crystals

Education

University of California, Berkeley 2010 – 2015

Ph.D. in Chemistry

with Profs. T. Don Tilley and Robert G. Bergman

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

Scripps College, Claremont, CA 2006 – 2010

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

Publications

* denotes corresponding authorship; ‡ denotes equal contribution; undergraduates underlined

With Chapman University Affiliation:

(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)

(20) **Liberman-Martin, A. L.*** Ruthenium Olefin Metathesis Catalysts Featuring Chelating Benzylidene-Triazole Ligands. *Chem Catalysis* **2023**, *3*, 100725. (invited Preview article)

(19) **Liberman-Martin, A. L.**; ‡ van Vleet, M.; ‡ Zapeda, E.; 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”)

(18) Fleener, C. R.; Chang, D. K.; **Lieberman-Martin, A. L.*** Carbodiphosphorane-Catalyzed Hydroboration of Ketones and Imines. *Organometallics* **2021**, *40*, 4050–4054.

- A “Most Read” article from December 2021–February 2022 on the *Organometallics* website
- This work is highlighted in the “Out in Inorganic Chemistry: A Celebration of LGBTQIAPN+ Inorganic Chemists” virtual issue of *Inorganic Chemistry*

(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.

- 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.

(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”)

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.

(13) **Lieberman-Martin, A. L.**; Grubbs, R. H. Ruthenium Olefin Metathesis Catalysts Featuring a Labile Carbodicarbene Ligand. *Organometallics* **2017**, *36*, 4091–4094.

(12) **Lieberman-Martin, A. L.**; Chu, C. K.; Grubbs, R. H. Application of Bottlebrush Block Copolymers as Photonic Crystals. *Macromol. Rapid Commun.* (special issue on “Polymers and Light”), **2017**, DOI: 10.1002/marc.201700058.

- Featured in *Advanced Science News*
- A “Most Accessed” article of 2017 on the *Macromol. Rapid Commun.* Website

(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.

(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.

(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.

(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.

(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.

(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

(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* (special issue dedicated to Malcolm L. H. Green) **2016**, *116*, 111–115.

(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.

(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.

- Featured in *Synfacts*, 2015; 11(7): 0764.
- Featured in *ChemInform*, 46: DOI: 10.1002/chin.201538046

(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.

(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 & Trimethylamine-N-oxide in Particulate Matter by Non-suppressed Ion Chromatography. *J. Chromatogr. A.* **2010**, *1217*, 2070–2073.

Manuscripts in Preparation

Janda, B.; Tran, J.; Chang, D. K.; **Lieberman-Martin, A. L.*** Carbodiimide and Isocyanate Hydroboration by Zerovalent Carbon Compounds. (invited submission to *Chemistry – A European Journal*; will be submitted during Fall 2023).

Robertson, H.; Fujiwara, M.; **Lieberman-Martin, A. L.*** Group 14 Metallocene Catalysts for Carbonyl Hydroboration and Cyanosilylation. (invited submission to *Polyhedron* special issue of “Emerging investigators in Inorganic Chemistry”; will be submitted during Fall 2023).

Honors and Awards

At Chapman

- Cottrell Scholar Award 2023
- Valerie Scudder Award (recognition of outstanding achievement in teaching, scholarly/creative activity, and service to Chapman University) 2023
- American Chemical Society Division of Inorganic Chemistry Award for Undergraduate Research (with Ben Janda) 2022

At Caltech

- Resnick Sustainability Institute Postdoctoral Fellowship 2016–2018
- Outstanding Poster Award, Division of Polymer Chemistry 2017
253rd American Chemical Society National Meeting, San Francisco, CA

At UC Berkeley

- Benjamin Boussett Memorial Award (UC Berkeley, Department of Chemistry) 2016
Award for exemplifying commitment to social or environmental change
- Margaret Jorgenson Memorial Prize Travel Grant (UC Berkeley) 2013
- Graduate Division Conference Travel Grant (UC Berkeley) 2013 and 2015

At Scripps College

- Barbara McClintock Award for Best Senior Thesis in the Sciences 2010
- ACS Division of Inorganic Chemistry Undergraduate Award 2009

Grant Funding at Chapman University

External Support (\$407,421 total)

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

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

- Chapman Pedagogical Innovation Award and Grant 2020–2021
“Development of a Concept Video Library and Class Demonstrations for an Advanced Organic Chemistry Course” (\$5,000)
- Chapman University Faculty Opportunity Fund Grant (\$15,000) 2019–2021
- Chapman Grant Writers Bootcamp Grant (\$5,000) 2019–2021

Teaching Experience

Chapman University

- CHEM 230: Organic Chemistry Fall 2018–2023

- CHEM 230L: Organic Chemistry I Laboratory Fall 2018, 2019
- CHEM 331: Organic Chemistry II Spring 2019–2021, 2023
- CHEM 331L: Organic Chemistry II Laboratory Spring 2019
- CHEM 432: Advanced Organic Chemistry Fall 2020, 2022

California Institute of Technology

- Ch101: “Revolutionary Inorganic Molecules” (co-instructor) 2016

University of California, Berkeley (as a Graduate Student Instructor)

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

Presentations with Chapman University Affiliation

Undergraduate researchers are underlined; bolded name denotes the presenter

Liberma-Martin, A. L. Zerovalent carbon catalysts for the reduction of C=O and C=N bonds. American Chemical Society National Meeting, San Francisco, CA, August 2023.

Liberma-Martin, A. L. Catalytic Activity of Zerovalent Carbon Compounds. Organometallics Gordon Research Conference, Newport, RI, July 2023. (invited talk)

Liberma-Martin, A. L.; Chang, D. K.; Fleener, C. R.; Sullivan, L.; Janda, B. Carbodiphosphoranes as Organocatalysts for Hydroboration and Hydrosilylation Reactions. American Chemical Society National Meeting, San Diego, CA, March 2022. (invited talk in the Phosphorus Chemistry Symposium)

Liberma-Martin, A. L. Nucleophilic Carbon Catalysts for Organic and Polymer Synthesis. Chemistry Department Seminar (by remote video), Reed College, March 2022. (invited talk)

Liberma-Martin, A. L. Nucleophilic Carbon Catalysts for Organic and Polymer Synthesis. Chemistry Seminar (by remote video), Montclair State University, November 2021. (invited talk)

Liberma-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)

Liberma-Martin, A. L. Main Group Catalysts for Organic and Polymer Synthesis. Chemistry Department Seminar (by remote video), Cleveland State University, January 2021. (invited talk)

Chang, D. K.; Fleener, C. R.; Naumann, R. A.; **Liberma-Martin A. L.** Metal-Free Catalysts for Organic and Polymer Synthesis. Schmid Science Forum (by remote video), Chapman University, November 2020 (invited talk).

Liberma-Martin, A. L.; Chang, D. K.; Fleener, C. R. Hydroboration by a Cyclic Carbodiphosphorane Organocatalyst. Organometallics Gordon Research Conference, Newport, RI, July 2019. (contributed poster)

Service and Outreach

As an Assistant Professor at Chapman University

Service to the chemistry profession and broader community

- Ad hoc manuscript reviewer: 2018–present
Journal of the American Chemical Society, CHEM, Chem Catalysis, Chemical Science, Chemical Communications, Dalton Transactions, Green Chemistry, Organic and Biomolecular Chemistry, Journal of Chemical Education
- Ad hoc grant proposal reviewer 2021–present
 - American Chemical Society Petroleum Research Fund 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 member (2023 cycle) 2022
- Facilitator for ACS “Postdoc to Faculty” workshop 2022
Led session on inclusive teaching methods
- Presider: *Phosphorus Chemistry Symposium*, Division of Inorganic Chemistry, American Chemical Society National Meeting, San Diego, CA. 2022
- Caltech panelist on “Demystifying the Research Statement” 2020
- Invited speaker to University of California, Berkeley’s Science, Leadership, and Management Seminar Series on “Mentoring and Working with Undergraduates” 2019
- Judge for the California Junior Science and Humanities Symposium (JSHS) 2019

Service to the Chapman University community

- Member, Search Committees (3): 2019–2023
Instructional Assistant Professor of Chemistry (2); Assistant Professor of Mathematics
- Member, Working Groups (3): 2018–2022
 - ACS Chemistry Exit Exam working group (2022)
 - Macromolecular Curriculum (2021–2022)
 - Organic Chemistry Curriculum Development (2018–2019)
- Member, Academic Integrity Committee 2021–2023
- Member, Beckman Scholars Program Selection Committee 2021, 2023
- Panelist:
 - “Successful Grantee Panel” during the STEM Grant Writers Bootcamp (2023)
 - Introduction to Chemistry Majors & Career Paths course (2019, 2020, 2022, 2023)
- Invited Discussion Leader:
 - “Flipped Classrooms” Discussion within Schmid College (2020)
 - “Pathway to a PhD in Science” Discussion with the Chapman TriBeta Biological Honor Society (2018)
- Chapman Tutoring and Learning Center Advisory Board member 2021–present
- Co-founder and co-director of the Chemistry & Biochemistry Seminar Series 2018–present

At Caltech

- Speaker on “Interviewing for Faculty Positions” panel 2018
Caltech Project for Effective Teaching event
- Caltech Teaching Conference Organizing Committee 2017
Facilitated a conference session on authoring problem sets and exams

- Women Mentoring Women Program 2016–2018
- *Presider: New Synthesis & Characterization of Polymers*, Division of Polymer Chemistry, American Chemical Society National Meeting, Washington DC 2017

At UC Berkeley

- Student Chair, Chemical Sciences Division Catalysis Group
Lawrence Berkeley National Laboratory 2013–2015
 - Organized a monthly interdisciplinary seminar series
- Bay Area Scientists in Schools classroom volunteer 2010–2015
 - “Be a Scientist” program mentoring 7th grade students’ scientific investigations over a two-month period

Research Mentoring Experience

Postdoctoral Scholar

Dr. Zach Thammavongsy Fall 2019–Summer 2022
Current Position: Assistant Professor of Chemistry, Santiago Canyon College

Undergraduate Researchers

An Dang '24 Summer 2022–present

Julie Tran '24 Summer 2022–present

Ben Janda '23 Spring 2021–Spring 2023

After Chapman: Ph.D. candidate in Chemistry at UCLA
Awards: Goldwater Scholar (2022), Beckman Scholar (2022), American Chemical Society Division of Inorganic Chemistry Award for Undergraduate Research (2022), Poster Award Winner at the 2022 National Organic Chemistry Symposium, Cheverton Award recipient (Chapman’s highest honor for undergraduate students), Chapman Outstanding Senior in Chemistry Award

After Chapman: Ph.D Program in Chemistry at UCLA

Haley Robertson '23 Fall 2021–Spring 2023

Alexa Wilson '23 Spring 2020–Fall 2022

Tamara Elenberger '22 Spring 2020 – Fall 2021

After Chapman: Research assistant at PhageTech

Liam Sullivan '22 Spring 2020–Spring 2022

After Chapman: Master’s Degree program in Chemistry at Cal Poly Pomona

Awards: American Chemical Society Senior Leadership Award

Biyu (Chelsea) Zhao '22 Spring 2022–Summer 2022

After Chapman: Ph.D. candidate in Chemistry at Colorado State University

Awards: American Chemical Society Undergraduate Award in Organic Chemistry

Vanna Kizirian '22 Spring 2020–Spring 2021

After Chapman: Production team at Honey Pot Meadery

Roxanne Naumann '21	Summer 2019–Spring 2021 After Chapman: Ph.D. candidate in Chemistry at UC - San Diego (Romero group) Awards: Co-Recipient of Chapman Outstanding Senior in Chemistry award
Cara Fleener '21	Spring 2019–Spring 2021 After Chapman: Emergency medical technician (EMT)
Daniel Chang '19	Fall 2018–Spring 2020 After Chapman: Software engineer; received an M.S. in Chemistry at the California Institute of Technology (Reisman Group) Major Awards: NSF Graduate Research Fellowship, Ronald M. Huntington Award recipient (campus-wide award for research accomplishments), Outstanding Senior in Chemistry award
Ali Mahmoud	Spring 2020 After Chapman: transferred to the University of Washington; received B.S.Ch.E. in Chemical Engineering

High School Researchers (through the Simon-Orange-Chapman STEM Scholars Program)

Alberto Alvalos	Spring 2023
Joshua Martinez	Spring 2023
Evangelina Ocampo	Spring 2022
Alexa Tellez-Barajas	Spring 2022

At Caltech and UC Berkeley

Jayce Miller; Caltech undergraduate (supervised 2016–2018)
 Jana Schmitt; visiting master's student (supervised 2013–2014)
 Myles Walden; high school research student (supervised Summer 2012)