Carson J. Bruns
carson.bruns@colorado.edu
www.carsonbruns.com

ATLAS Institute / Rady Department of Mechanical Engineering
Director, Synthetic, Emergent, and Animate Materials (SEAM) Lab
University of Colorado Boulder, 1125 18th St, Boulder, CO 80309

molecular machines · smart tattoos · eco-plastics · hydrogels · clean energy · robotics · interaction design · art

EDUCATION

• Doctor of Philosophy Organic Chemistry	*Northwestern University* Advisors: J. Fraser Stoddart, Samuel I. Stupp	December 2013
• Bachelor of Arts *magna cum laude* Majors: Chemistry, Religion | Minor: Mathematics	*Luther College*	May 2008

PROFESSIONAL EXPERIENCE

• Associate Professor	*University of Colorado Boulder*	2025–present
• Assistant Professor	*University of Colorado Boulder*	2017–2025
• Co-Founder, President, Chief Science Officer	*HYPRSKN INC*	2022–Present
• Co-Founder, President, Chief Science Officer	*MGC INK CORP*	2022–Present
• Co-Founder & President	*CHROMAPRAXIS LLC*	2021–2022
• Miller Research Fellow	*University of California Berkeley*	2014–2017

AWARDS / HONORS

Featured Scientist, *Chemistry is Interdisciplinary*	*American Chemical Society (ACS) 150th Anniversary Film Series*	2026
Provost's Faculty Achievement Award	*University of Colorado Boulder*	2024
ASME Rising Star of Mechanical Engineering	*ASME International Mechanical Engineering Congress and Expo (IMECE)*	2024
NSF CAREER Award	*National Science Foundation*	2023
Outstanding Faculty Mentor Award	*University of Colorado Boulder*	2022
Featured Talk, TED.com Homepage	*TED Talks go.ted.com/carsonbruns*	2019
Miller Research Fellowship	*Miller Institute, UC Berkeley*	2014–2017
Springer ISMSC2015 Poster Prize	*International Symposium on Macrocyclic & Supramolecular Chemistry*	2015
NSF East Asia and Pacific Summer Institutes JSPS Summer Program Fellow	*University of Tokyo*	Summer 2013
NSF Graduate Research Fellowship	*National Science Foundation*	2010–2013
World Class University Project Visiting Scholar	*Korea Advanced Institute of Science and Technology (KAIST)*	Fall 2011
Global Center of Excellence Visiting Scholar	*University of Tokyo*	Spring 2010
Springer ISMSC2010 Poster Prize	*International Symposium on Macrocyclic & Supramolecular Chemistry*	2010
Graduate Assistance in Areas of National Need	*U.S. Department of Education*	2008–2009
John G. and Mildred Breiland Fellowship	*Luther College Dept. of Chemistry*	2007–2008
NSF Research Experience for Undergraduates	*Chulabhorn Research Institute*	Summer 2007
NSF Research Experience for Undergraduates	*Coe College*	Summer 2006
Regents Scholarship	*Luther College*	2004–2008

PUBLICATIONS

Google Scholar: 5212 Citations, *h*-index 31, *i*10 index 51

ORCiD: 0000-0002-4285-2725 *Scopus Author ID*: 35434518400 *ResearcherID:* A-1342-2014

=equal authors | >Bruns advisor | ^Bruns advisees | *Corresponding author

Books

CJ Bruns,* JF Stoddart.*> *The Nature of the Mechanical Bond: From Molecules to Machines*. Hoboken: Wiley, 2016. 761 pages. ISBN: 9781119044000. doi.org/10.1002/9781119044123

Peer-Reviewed Publications

Work at CU Boulder:

63. **CJ Bruns,*** M Stockton,^ E Gardner,^ H Kwon.^ Programmable pigments: multicolor photochromic nanoparticle inks for rewritable intradermal smart tattoos. *Matter & Light* **2026**, *1*:100119. doi.org/10.1016/j.matlit.2026.100119 ***Front Cover***

62. K McCurdy, JL Butterfield,^ H Kwon,^ E Gardner,^ M Jordan, M Ganser, MJ Mouncer, J Osis, C Clement, AV Mudgil,* **CJ Bruns.*** Clinical Evaluation of Photochromic Nanoparticle Tattoo Ink: Safety, Tolerability, and Performance of Rewritable Intradermal Implants. *J. Nanobiotechnology* **2026**, *24*:894. doi.org/10.1186/s12951-026-04755-x

61. DN Jung,^ M Stancliffe, G Burleson, **CJ Bruns.*** Mixed-Methods Evaluation of a Middle School LEGO®-Based Hands-On STEM Workshop. In *2026 ASEE Annual Conference & Exhibition*, Charlotte, NC: American Society for Engineering Education. **2026**, *50622.* doi.org/10.18260/1-2--59008

60. S Mandal,^ I Lorente Montero,^ AM Visal,^ **CJ Bruns.*** Asymmetric Doping of a Polyelectrolyte Network into a Tough Slide-Ring Hydrogel Membrane to Enhance Sustainable Osmotic Energy Harvesting. *Small Science* **2026**, *6*:e70334. doi.org/10.1002/smsc.70334

59. S Mandal,^ S Assadi, AM Visal,^ I Lorente Montero,^ FJ Vernerey,* **CJ Bruns.*** Synergistic Dual Slip-Link Toughening of a Water-Rich Double Network Hydrogel Combining Slide-Ring and Highly Entangled Networks. *Adv. Sci.* **2026**, *13*:e75525. doi.org/10.1002/advs.75525

58. DN Jung,^ C Escobedo, N Liska, M Gramopadhye, D Szafir, A Roncone, **CJ Bruns.*** Design of a Robot-Assisted Chemical Dialysis System. In *Companion of the 21st ACM/IEEE International Conference on Human-Robot Interaction (HRI Companion '26)*; Association for Computing Machinery: New York, NY, USA, **2026**; pp 416–420. doi.org/10.1145/3776734.3794427

57. DN Jung,^ KE Shara,^ **CJ Bruns.*** LEGO® as a versatile platform for building reconfigurable low-cost lab equipment. *PLOS ONE* **2025**, *20*:e0326938. doi.org/10.1371/journal.pone.0326938

56. DN Jung,^ **CJ Bruns*.** An Analysis of Workloads Experienced by Scientists Working in the Chemical Wet Lab. *2025 International Design Engineering Technical Conference (IDETC-2025).* Paper #164550. doi.org/10.1115/DETC2025-164550

55. DN Jung,^ **CJ Bruns*.** Typology Development for Synthetic Chemistry Sub-Tasks: Towards Human-Robot Collaboration Task Design in the Wet Lab. *2024 International Design Engineering Technical Conference (IDETC-2024).* Paper #142677. doi.org/10.1115/DETC2024-142677

54. JL Butterfield,^ JR Quigley,^ **CJ Bruns**.* Smart Tattoos of Intradermally Implanted Photochromic Nanosensors for Personal UV Sensing and Dosimetry. *Adv. Funct. Mater.* **2024**, *34*:2405831. doi.org/10.1002/adfm.202405831

53. J-B Kauzya, B Hayes, AC Hayes, JF Thompson, C Bellerjeau, K Evans, J Osio-Norgaard, G Gavai, K Dikshit,^ **C Bruns**, R MacCurdy, RA Street, GL Whiting.* Direct ink writing of viscous inks in variable gravity regimes using parabolic flights. *Acta Astronautica* **2024**, *219*, 569–579. doi.org/10.1016/j.actaastro.2024.03.037

52. Purnendu,^ J Hartcher-O'Brien, V Mehta, N Colonnese, A Gupta, **CJ Bruns**, P Agarwal.* Fingertip Wearable High Resolution Electro-Hydraulic Interface for Multi-modal Haptics. *2023 IEEE World Haptics Conference (WHC)*, Delft, Netherlands, **2023**, 299–305. doi.org/10.1109/WHC56415.2023.10224383

51. SC Lamont, K Weishaar, **CJ Bruns**, FJ Vernerey.* Micromechanics and Damage in Slide-Ring Networks. *Phys. Rev. E* **2023**, *107*:044501. doi.org/10.1103/PhysRevE.107.044501

50. KV Dikshit,^ AM Visal,^ F Janssen,^ A Larsen,^ **CJ Bruns.*** Pressure-Sensitive Supramolecular Adhesives Based on Lipoic Acid and Bio-Friendly Dynamic Cyclodextrin and Polyrotaxane Cross-Linkers. *ACS Appl. Mater. Interfaces* **2023**, *15*, 17256–17267. doi.org/10.1021/acsami.3c00927

49. M Atreya, S DeSousa, J-B Kauzya, E Williams, K Dikshit,^ A Hayes, J Nielson, A Palmgren, S Khorchidian, S Liu, A Gopalakrishanan, E Bihar, **CJ Bruns**, R Bardgett, JN Quinton, J Davies, JC Neff, GL Whiting.* A Transient Printed Soil Decomposition Sensor based on a Biopolymer Composite Conductor. *Adv. Sci.* **2023**, *10:*2205785 doi.org/10.1002/advs.202205785

48. Y Sui, AN Radwan, A Gopalakrishnan, K Dikshit,^ **CJ Bruns**, CA Zorman, GL Whiting.* A Reactive Inkjet Printing Process for Fabricating Biodegradable Conductive Zinc Structures. *Adv. Eng. Mater.* **2023***, 25:*2200529. doi.org/10.1002/adem.202200529

47. KV Dikshit,^ **CJ Bruns**.* Slide-Ring Materials Based on Self-Assembled Polyrotaxane "Molecular Necklaces". In *Supramolecular Nanotechnology. Advanced Design of Self-Assembled Functional Materials.* M Conda-Sheridan, O Azzaroni (Eds.) Weinheim: Wiley-VCH GmbH, **2023**. 565–594. doi.org/10.1002/9783527834044.ch21

46. **CJ Bruns.*** Moving Forward in the Semantic Soup of Artificial Molecular Machine Taxonomy. *Nat. Nanotechnol.* **2022**, *17*, 1231–1234. doi.org/10.1038/s41565-022-01247-5

45. M Atreya, G Marinick, C Baumbauer, KV Dikshit,^ S Liu, C Bellerjeau, J Nielson, S Khorchidian, A Palmgren, Y Sui, R Bardgett, D Baumbauer, **CJ Bruns**, JC Neff, AC Arias, GL Whiting.* Wax Blends as Tunable Encapsulants for Soil-Degradable Electronics. *ACS Appl. Electron. Mater.* **2022***, 4*, 4912–4920. doi.org/10.1021/acsaelm.2c00833

44. H Kwon,^ B Newell, **CJ Bruns**.* Redox-Switchable Host-Guest Complexes of Metallocenes and [8]Cycloparaphenylene. *Nanoscale* **2022**, *14*, 14276–14285. doi.org/10.1039/d2nr03852h

43. KV Dikshit,^ **CJ Bruns**.* Chemorheological Monitoring of Cross-Linking in Slide-Ring Gels Derived from α-Cyclodextrin Polyrotaxanes. *Front. Chem.* **2022**, *10*:923775. doi.org/10.3389/fchem.2022.923775

42. JL Butterfield,^ GP Penoncello, KV Dikshit,^ **CJ Bruns**.* A Photochromic Intradermal Smart Tattoo Based on Diarylethene-Doped Polystyrene Nanoparticles for Personal γ-Ray Dosimetry. *ACS Appl. Nano Mater.* **2022**, *5*, 13840–13844. doi.org/10.1021/acsanm.2c01554

41. H Kwon,^ **CJ Bruns**.* All-Hydrocarbon, All-Conjugated Cycloparaphenylene-Polycyclic Aromatic Hydrocarbon Host-Guest Complexes Stabilized by CH–π Interactions. *Nano Research* **2022***, 15*, 5545–5555. doi.org/10.1007/s12274-022-4145-5

40. X Zhou, H Kwon,^ RR Thompson, R Herman, FR Fronczek, **CJ Bruns**, S Lee.* Scalable Synthesis of [8]Cycloparaphenyleneacetylene via Alkyne Metathesis and Bromination/ Dehydro-bromination. *Chem. Commun.* **2021**, *57*, 10887–10890. doi.org/10.1039/D1CC04776K

39. Purnendu,^ S Novack, E Acome, M Alistar, C Keplinger, MD Gross, **C Bruns**, D Leithinger. Electriflow: Augmenting Books With Tangible Animation Using Soft Electrohydraulic Actuators *SIGGRAPH '21 Labs*, August 09-13, **2021**, Virtual, USA. doi.org/10.1145/3450616.3464523

38. Purnendu,^ S Novack, E Acome, C Keplinger, M Alistar, MD Gross, **C Bruns**, D Leithinger. Electriflow: Soft Electrohydraulic Building Blocks for Prototyping Shape-changing Interfaces, In *Designing Interactive Systems Conference 2021 (DIS '21), June 28-July 2,* **2021**, *Virtual Event.* ACM, New York, NY, USA, 10 pages. doi.org/10.1145/3461778.3462093

37. Purnendu,^ E Acome, C Keplinger, MD Gross, **C Bruns**, D Leithinger. Soft Electrohydraulic Actuators for Origami Inspired Shape-Changing Interfaces. In *CHI Conference on Human Factors in Computing Systems Extended Abstracts (CHI '21 Extended Abstracts), May 8–13,* **2021***, Yokohama, Japan.* ACM, New York, NY, USA, 6 pages. doi.org/10.1145/3411763.3451590

36. KV Dikshit,^ **CJ Bruns**.* Post-Synthesis Modification of Slide-Ring Gels for Thermal and Mechanical Reconfiguration. *Soft Matter* **2021**, *17*, 5248–5257. doi.org/10.1039/D0SM02260H

35. A Parameswar, KV Dikshit,^ S Movafaghi, **CJ Bruns**, AP Goodwin.* Mechanochemistry Activated Covalent Conjugation Reactions in Soft Hydrogels Induced by Interfacial Failure. *ACS Appl. Mater. Interfaces* **2021**, *13*, 1486–1492. doi.org/10.1021/acsami.0c18432

34. JL Butterfield,^ SP Keyser,^ KV Dikshit,^ H Kwon,^ MI Koster, **CJ Bruns**.* Solar Freckles: Long-Term Photochromic Tattoos for Intradermal UV Radiometry. *ACS Nano* **2020**, *14*, 13619–13628. doi.org/10.1021/acsnano.0c05723

33. M Atreya, K Dikshit,^ G Marinick, J Nielson, **C Bruns,** GL Whiting.* Poly(lactic acid)-Based Ink for Biodegradable Printed Electronics With Conductivity Enhanced Through Solvent Aging. *ACS Appl. Mater. Interfaces* **2020**, *12*, 23494–23501. doi.org/10.1021/acsami.0c05196

32. **CJ Bruns**.* Exploring and Exploiting the Symmetry-Breaking Effect of Cyclodextrins in Mechanomolecules. *Symmetry* **2019**, *11*:1249. doi.org/10.3390/sym11101249

31. D Sluysmans, F Devaux, **CJ Bruns**, JF Stoddart,[>] A-S Duwez.* Dynamic Force Spectroscopy of Synthetic Oligorotaxane Foldamers. *Proc. Natl. Acad. Sci. U.S.A*. **2018**, *115*, 9362–9366. doi.org/10.1073/pnas.1712790115

30. D Sluysmans, S Hubert, **CJ Bruns,** Z Zhu, JF Stoddart,[>] A-S Duwez.* Synthetic Oligorotaxanes Exert High Forces When Folding Under Mechanical Load. *Nat. Nanotechnol.* **2018**, *13*, 209–213. doi.org/10.1038/s41565-017-0033-7

Prior to CU Boulder:

29. S Loser, SJ Lou, BM Savoie, **CJ Bruns**, A Timalsina, MJ Leonardi, T Harschneck, R Turrisi, N Zhou, CL Stern, AA Sarjeant, A Facchetti,* RPH Chang,* SI Stupp,[>]* MA Ratner,* LX Chen,* TJ Marks.* Systematic Evaluation of Structure-Property Relationships in Heteroacene-Diketopyrrolo-pyrrole Molecular Donors for Organic Solar Cells. *J. Mater. Chem. A* **2017***, 5*, 9217–9232. doi.org/10.1039/C7TA02037F

28. CC Slack, JA Finbloom, K Jeong, **CJ Bruns**, DE Wemmer, A Pines, MB Francis.[>]* Rotaxane Probes for Protease Detection by ^{129}Xe HyperCEST NMR. *Chem. Commun*. **2017**, *53*, 1076–1079. doi.org/10.1039/C6CC09302G

27. JA Finbloom, CC Slack, **CJ Bruns**, K Jeong, DE Wemmer, A Pines, MB Francis.[>]* Rotaxane-Mediated Suppression and Activation of Cucurbit[6]uril for Molecular Detection by ^{129}Xe HyperCEST NMR. *Chem. Commun.* **2016**, *52*, 3119–3122. doi.org/10.1039/C5CC10410F

26. **CJ Bruns**, H Liu,^ MB Francis.[>]* Near-Quantitative Aqueous Synthesis of Rotaxanes via Bioconjugation to Oligopeptides and Proteins. *J. Am. Chem. Soc.* **2016**, *138*, 15307–15310. doi.org/10.1021/jacs.6b10231

25. T Aytun, PJ Santos, **CJ Bruns**, D Huang, AR Koltonow, M Olvera de la Cruz, SI Stupp.[>]* Self-Assembling Tripodal Small-Molecule Donors for Bulk Heterojunction Solar Cells. *J. Phys. Chem. C* **2016**, *120*, 3602–3611. doi.org/10.1021/acs.jpcc.5b10064

24. X Hou,[=] C Ke,[=] **CJ Bruns**, PR McGonigal, RB Pettman, JF Stoddart.[>]* Tunable Solid-State Fluorescent Materials for Supramolecular Encryption. *Nat. Commun.* **2015**, *6:*6884. doi.org/10.1038/ncomms7884

23. **CJ Bruns**,[=] D Fujita,[=] M Hoshino, S Sato, JF Stoddart,[>]* M Fujita.* Emergent Ion-Gated Binding of Cationic Host-Guest Complexes Within Cationic $M_{12}L_{24}$ Molecular Flasks. *J. Am. Chem. Soc.* **2014**, *136*, 12027–12034. doi.org/10.1021/ja505296e

22. **CJ Bruns**, JF Stoddart.[>]* Rotaxane-Based Molecular Muscles. *Acc. Chem. Res.* **2014**, *47*, 2186–2199. doi.org/10.1021/ar500138u

21. **CJ Bruns**, M Frasconi, J Iehl, KJ Hartlieb, ST Schneebeli, C Cheng, SI Stupp,[>]* JF Stoddart.[>]* Redox Switchable Daisy Chain Rotaxanes Driven by Radical-Radical Interactions. *J. Am. Chem. Soc.* **2014**, *136*, 4714–4723. doi.org/10.1021/ja500675y ***Featured in JACS Spotlights***

20. **CJ Bruns**, J Li, M Frasconi, ST Schneebeli, J Iehl, H-P Jacquot de Rouville, SI Stupp,[>] GA Voth,* JF Stoddart.[>]* An Electrochemically and Thermally Switchable Donor-Acceptor [*c*2]Daisy Chain Rotaxane. *Angew. Chem., Int. Ed.* **2014**, *53*, 1953–1958. doi.org/10.1002/anie.201308498

19. **CJ Bruns**, JF Stoddart.[>]* Mechanically Interlaced and Interlocked Donor-Acceptor Foldamers. *Adv. Polym. Sci.* **2013**, *261*, 271–294. doi.org/10.1007/12_2013_245

18. AC Fahrenbach, **CJ Bruns**, H Li, A Trabolsi, A Coskun, JF Stoddart.[>]* Ground-State Kinetics of Bistable Redox-Active Donor-Acceptor Mechanically Interlocked Molecules. *Acc. Chem. Res.* **2014**, *47*, 482–493. doi.org/10.1021/ar400161z

17. **CJ Bruns**,[=] DJ Herman,[=] JB Minuzzo, JA Lehrman, SI Stupp.[>]* Rationalizing Molecular Design in Electrodeposition of Anisotropic Lamellar Nanostructures. *Chem. Mater.* **2013**, *25*, 4330–4339. doi.org/10.1021/cm402505p

16. A Ruiz-Carretero, T Aytun, **CJ Bruns**, CJ Newcomb, W-W Tsai, SI Stupp.[>]* Stepwise Self-Assembly to Improve Solar Cell Morphology. *J. Mater. Chem. A* **2013**, *1*, 11674–11681. doi.org/10.1039/C3TA12411H

15. A Guerrero, SC Loser, G Garcia-Belmonte, **CJ Bruns**, J Smith, H Miyauchi, SI Stupp,[>] J Bisquert,* TJ Marks.* Solution-Processed Small Molecule:Fullerene Bulk-Heterojunction Solar Cells: Impedance Spectroscopy Deduced Bulk and Interfacial Limits to Fill-Factor. *Phys. Chem. Chem. Phys.* **2013**, *15*, 16456–16462. doi.org/10.1039/C3CP52363B

14. M Juriček,[=] JC Barnes,[=] EJ Dale, W-G Liu, NL Strutt, **CJ Bruns**, NA Vermeulen, K Ghooray, AA Sarjeant, CL Stern, YY Botros, WA Goddard III,* JF Stoddart.[>]* Ex^{2}Box: Interdependent Modes of

Binding in a Two-Nanometer-Long Synthetic Receptor. *J. Am. Chem. Soc.* **2013**, *135*, 12736–12746. doi.org/10.1021/ja4052763

13. **CJ Bruns**, JF Stoddart.>* Molecular Machines Muscle Up. *Nat. Nanotechnol.* **2013**, *8*, 9–10. doi.org/10.1038/nnano.2012.239
12. Z Zhu, **CJ Bruns**, H Li, J Lei, C Ke, Z Liu, S Shafaie, HM Colquhoun, JF Stoddart.>* Synthesis and Solution-State Dynamics of Donor-Acceptor Oligorotaxane Foldamers. *Chem. Sci.* **2013**, *4*, 1470–1483. doi.org/10.1039/C3SC00015J
11. JC Barnes,= M Juriček,= NL Strutt, M Frasconi, S Sampath, MA Giesener, PL McGrier, **CJ Bruns**, CL Stern, AA Sarjeant, JF Stoddart.>* ExBox: A Polycyclic Aromatic Hydrocarbon Scavenger. *J. Am. Chem. Soc.* **2013**, *135*, 183–192. doi.org/10.1021/ja307360n
10. **CJ Bruns**, JF Stoddart.>* The Mechanical Bond: A Work of Art. *Top. Curr. Chem.* **2012**, *323*, 19–72. doi.org/10.1007/128_2011_296
9. CM Gothard,= **CJ Bruns,**= NA Gothard, BA Grzybowski, JF Stoddart.>* Modular Synthesis of Bipyridinium Oligomers and Corresponding Donor-Acceptor Oligorotaxanes with Crown Ethers. *Org. Lett.* **2012**, *14*, 5066–5069. doi.org/10.1021/ol302301r
8. H-P Jacquot de Rouville, J Iehl, **CJ Bruns**, PL McGrier, M Frasconi, AA Sarjeant, JF Stoddart.>* A Neutral Naphthalene Diimide [2]Rotaxane. *Org. Lett.* **2012**, *14*, 5188–5191. doi.org/10.1021/ol3022963
7. AN Basuray, H-P Jacquot de Rouville, KJ Hartlieb, T Kikuchi, NL Strutt, **CJ Bruns**, MW Ambrogio, A-J Avestro, ST Schneebeli, AC Fahrenbach, JF Stoddart.>* The Chameleonic Nature of Diazopyrenium Recognition Processes. *Angew. Chem., Int. Ed.* **2012**, *51*, 11872–11879. doi.org/10.1002/anie.201205089
6. AC Fahrenbach, KJ Hartlieb, C-H Sue, **CJ Bruns,** G Barin, S Basu, MA Olson, YY Botros, A Bagabas, N Khdary, JF Stoddart.>* Rapid Thermally Assisted Donor-Acceptor Catenation. *Chem. Commun.* **2012**, 48, 9141–9143. doi.org/10.1039/C2CC34427K
5. AC Fahrenbach, **CJ Bruns**, D Cao, JF Stoddart.>* Ground-State Thermodynamics of Redox-Active Donor-Acceptor Mechanically Interlocked Molecules. *Acc. Chem. Res.* **2012**, *45*, 1581–1592. doi.org/10.1021/ar3000629
4. S Loser, **CJ Bruns**, H Miyauchi, R Ponce Ortiz, A Facchetti,* SI Stupp,>* TJ Marks.* A Naphthodithiophene-Diketopyrrolopyrrole Donor Molecule for Efficient Solution-Processed Solar Cells. *J. Am. Chem. Soc.* **2011**, *133,* 8142–8145. doi.org/10.1021/ja202791n
3. **CJ Bruns**, S Basu, JF Stoddart.>* Improved Synthesis of 1,5-Dinaphtho[38]Crown-10. *Tetrahedron Lett.* **2010**, *51*, 983–986. doi.org/10.1016/j.tetlet.2009.12.060
2. RS Forgan, DC Friedman, CL Stern, **CJ Bruns**, JF Stoddart.>* Directed Self-Assembly of a Ring-in-Ring Complex. *Chem. Commun.* **2010**, *46*, 5861–5863. doi.org/10.1039/C0CC00776E ***Front Cover***
1. S Boonya-Udtayan, N Yotapan, C Woo, **CJ Bruns**, S Ruchirawat, N Thasana.>* Synthesis and Biological Activities of Azalamellarins. *Chem. Asian J.* **2010**, *5*, 2113–2123. doi.org/10.1002/asia.201000237

Non-Peer-Reviewed Publications

5. I Aprahamian, D Astumian, **C Bruns**, S Goldup, P Metrangolo, D Pooler. Molecular Machines: Terminology in Turmoil. *Chemistry World*. 29 April 2025. https://www.chemistryworld.com/opinion/take-two-polls-to-help-iupac-define-molecular-machines/4021360.article
4. **CJ Bruns**,* W Wang,* K Hirose.* Editorial: Recent Advances in Mechanically Bonded Molecules. *Front. Chem.* **2022**, *10*:1095082. doi.org/10.3389/fchem.2022.1095082
3. **CJ Bruns.*** Dynamic tattoos promise to warn wearers of health threats. *The Conversation,* **2020**. https://theconversation.com/dynamic-tattoos-promise-to-warn-wearers-of-health-threats-133040
2. CA Drahl.* Conversation with **Carson Bruns**. *ACS Cent. Sci.* **2019**, *5*, 201–202. doi.org/10.1021/acscentsci.9b00098 (Also appeared in *Chemical and Engineering News*, Volume 97, Issue 11. cenm.ag/bruns)
1. **CJ Bruns**.* Could a Tattoo Help You Stay Healthy? *TED^x*, **2019**. https://go.ted.com/carsonbruns

TRANSLATION & ENTREPRENEURSHIP

Co-founded HYPRSKN Inc. to commercialize permanent sun protection and MGC INK CORP to commercialize permanent-but-rewritable tattoo ink. Launched Magic Ink to market in May 2025: used by

>500 artists, currently in two hospital-funded clinical trials for medical use in radiation therapy and dermatology. Raised $6M in investment capital.

Patent Filings

7. K McCurdy, **C Bruns**, J Butterfield,^ J Osis. Electronic Multi-Lamp Pen for Activating Photo-Responsive Materials. *U.S. Patent 12,144,953*. Issued 19 November 2024.
6. KV Dikshit,^ A Visal,^ **CJ Bruns.** Pressure-Sensitive Supramolecular Adhesives. *U.S. Patent Application 18/771,169*. Filed 12 July 2024.
5. **C Bruns**, J Butterfield,^ H Kwon,^ E Gardner. Photochromic and Photoprotective Polymer Nanoparticle Pigments and Formulations for Topical Use. *PCT Patent Application No. PCT/US24/25637.* Filed 22 April 2024.
4. **C Bruns**, J Butterfield,^ H Kwon,^ E Gardner. *Ortho*-Phthalaldehyde-Functionalized Ultraviolet Absorbers and Visible Chromophores for Semi-Permanent Topical Applications. *PCT Patent Application No. PCT/US24/25644.* Filed 22 April 2024.
3. K Shara,^ A Plum, M Graybill, **CJ Bruns**. Systems and Methods for Transferring Free Flowing Material and Facilitating the Reaction Thereof. *U.S. Patent Application 18/702,885.* 19 April 2024.
2. JL Butterfield,^ **CJ Bruns**. Multistable Photochromic Pigments for Intradermal Use in Re-Writable Tattoos and Intradermal Ultraviolet Dosimetry. *PCT Patent Application No. PCT/US2022/022802* Filed 31 March 2022.
1. JL Butterfield,^ **CJ Bruns**. Ultraviolet-Absorptive Nanoparticles and Microparticles for Intradermal Use. *PCT Application PCT/US2021/47941.* Filed 27 August 2021.

RESEARCH FUNDING & GIFTS

	Value	Role	Portion	Dates
• *Plastic Fertilizer: Toward Sustainable Waste-Stream Plastics with Low Carbon Content and Cost.* RIO Seed Grant (Co-PI: M. Turetsky)	$55,997	PI	100%	7/1/25-12/31/26
• *Seamless Skin Integration of Brain/Body-Computer Interfaces for Cybernetic Human Advancement.* RIO New Frontiers Grant (PI: G. Leslie)	$50,000	Co-PI	50%	7/1/25-6/15/26
• *Molecular Machine Terminology. International Union of Pure & Applied Chemistry (IUPAC) Project #2024-004-2-100*	$5000	PI	100%	7/8/24-7/7/26
• *Magic Ink. Colorado OEDIT Advanced Industries Early Stage Capital & Retention Grant*	$250,000	PI	HYPRSKN	11/16/23-11/15/24
• *CAREER: Intradermal Biocompatibility of Nanoparticles as Minimally Invasive Implants for Human Health. NSF #2235902*	$605,170	PI	100%	9/1/23-8/31/27
• *A Versatile Robotic System for Automating Organic Chemistry Operations in the Laboratory. OEDIT AIA Proof of Concept / CU Lab Venture Challenge Award*	$62,500	PI	100%	4/1/23-8/31/24
• *Collaborative Research: FW-HTF-R: RoboChemistry: Human-Robot Collaboration for the Future of Organic Synthesis* NSF #2222952	$1,820,478	PI	33%	9/1/22-8/31/26
• *Efficient, Scalable, Compostable Thin-Film BioPolymer Nanogenerators.* Facebook Research Award (PI: K. Jayaram)	$149,259	Co-PI	50%	1/1/22-6/30/23
• *Smart Tattoos. Venture Partners / OEDIT Pandemic HyperAccelerator for Science & Technology (PHAST) Grant*	$25,000	PI	100%	8/1/21-1/25/22
• *Single-Particle Mechanics for Biocompatibility Studies of Anti-Photocarcinogenic Tattoos*. CU COSINC-CHR Material Characterization Project Award	$4,000	PI	100%	7/1/21-12/31/21
• *Self-Assembly of Shape-Defined Micro-Hydrogels: Top-Down Meets Bottom-Up*. NSF #2106158	$457,946	PI	100%	7/1/21-6/30/25
• *"Invisible Melanin": Permanent Transparent Tattoos that Reduce Skin Cancer and Aging Rates*. Colorado OEDIT Advanced Industries Accelerator Proof of Concept Award #CTGG1 2021-2891	$189,441 (25% CU cost share)	PI	100%	11/19/20-4/30/23

• *Transient Mechanics of Active Slide-Ring Networks: From Molecular Motors to Molecular Machine*. NSF #2023179 (PI: F. Vernerey)	$477,044	Co-PI	50%	1/1/21-12/31/25
• *Microscopic Intradermal Implants for Biomedical Tattoos*. CU UROP Faculty Team Grant	$3,000	PI	100%	AY 20/21
• *Colloidal Rotaxanes: Polymer Particles with Mechanical Bonds*. ACS PRF #59067-DNI7	$110,000	PI	100%	9/1/18-8/31/20
• *Robotic Chemists: Automating the Synthesis of Multi-functional Materials*. CU MFM / ASIRT Seed (PI: D. Szafir)	$30,000	Co-PI	50%	Spring 2018
• *A Chemistry Automation Robot*, VEX Robotics - Supplies Gift	$16,000	PI	100%	2020-23

MENTORING & TEACHING

Postdocs	Dates Mentored	Position
Hyejin Kwon	January–May 2026	Senior Scientist, Mallinda Inc.
Subhankar Mandal	June 2023–May 2025	Postdoc, NIMS (Japan)
Hyejin Kwon	June 2018–December 2021	Director of Chemical R&D, HYPRSKN

PhD Students	Dates Mentored	Position
Meenakshi Skandarajan	August 2025–present	PhD Student, CU
Joshua Coffie	August 2023–December 2025	PhD Student, CU
Diane Jung	January 2023–August 2026	Postdoc, Cornell University
Aseem Visal	August 2021–present	PhD Student, CU
Purnendu	September 2018–January 2024	Postdoc, Northwestern University
Kailey Shara	June 2018–December 2023	PhD Student, CU
Karan Dikshit	January 2018–August 2022	R&D Engineer, Thintronics
Jesse Butterfield	September 2017–May 2022	Co-Founder, HYPRSKN

MS Students	Dates Mentored	Position
Megem Leticia Demguo	February–June 2025	MS Student, ECAM, Belgium
Jackson Pope	Spring 2021	PhD Student, CU
Ninad Mehta	Fall 2019–Spring 2020	FEA Engineer, Caterpillar, Inc.
Sean Keyser	May–December 2019	Postdoc, CU Anschutz

Undergraduate Students	Dates Mentored
Phoebe Fisher	January 2026–present
Cooper Bellas	September 2025–present
Ruth Tully	September 2025–present
Mollie Stockton	October 2024–May 2025
Colin Watkins	September 2024–present
Roan Gerrald	September 2024–May 2025
Ariana Morales Garcia	September 2024–May 2025
Ignacio Lorente Montero	March 2024–June 2024
Emma Thomure	January 2024–May 2025
Caitlin Rogers	September 2023–May 2025
Zoe Zeidler	September 2023–May 2024
Neely Quirk	September 2022–May 2024
Julie Clarke	October 2021–May 2022
Femke Janssen	August 2021–May 2023
Teis Hart	August 2021–May 2022
Ferin von Reich	January 2021–December 2022
Jaime Wickersheim	Summer 2021
Elderied McKinney	Summer 2021
Matthew Kim	Spring 2021
Jennifer Quigley	Fall 2020–Summer 2021
Justin Hall	Summer 2020–Spring 2021
Rita Kamenetskiy	Spring–Summer 2020
Xuedan Filmore	Spring 2020

Emily Powis	Summer 2019
Ian Stokes	Summer 2019
Nicole Leon-Molina	Spring 2019
Aya Ishikawa	March 2019–May 2020
Sarah Sadeq	September–December 2018
Phillip Vo	January–December 2018
Hanwei Liu	March 2015–June 2016
Peter J. Santos	December 2012–May 2014
Brett Anderson	September 2011–May 2012

High School Students	**Dates Mentored**
Ramshreyas Mangu	Summer 2024
Samuel Scott	Summer 2024
Collin Watkins	September 2023–May 2024

Laboratory Technicians	**Dates Mentored**
Chrishma Hunter Singh-Derewa	Fall 2026–present
Emily Gardner	Q1 2026
Kiley Hartigan	April 2019–May 2020

Courses Developed	**Course Number**	**Semester**
Color	ATLS-4519/5519	Fall 2017

Courses Taught	**Course Number**	**Enrollment**	**Semester**
Chemistry for Materials and Energy Science	MCEN-1024-004	73	Fall 2025
Graduate Research Methods (co-taught)	ATLS-7500-001	8	Fall 2025
Color	ATLS-4141-001	22	Fall 2025
Research Career Development (co-taught)	ATLS-7600-002	4	Spring 2025
Chemistry for Materials and Energy Science	MCEN-1024-004	81	Spring 2025
Research Career Development (co-taught)	ATLS-7600-002	6	Spring 2024
Materials Science	MCEN-2024-002	76	Fall 2023
Color	ATLS-4141	17	Fall 2023
Research Career Development (co-taught)	ATLS-7600-002	6	Spring 2023
Color	ATLS-4141	18	Fall 2022
Chemistry for Materials and Energy Science	MCEN-1024-001	42	Fall 2022
Color	ATLS-4141	31	Spring 2022
Research Career Development (co-taught)	ATLS-5519-006	11	Spring 2022
Color	ATLS-4519/5519	14	Fall 2020
Chemistry for Materials and Energy Science	MCEN-1024-003	47	Fall 2020
Color	ATLS-4519/5519	10	Fall 2019
Chemistry for Materials and Energy Science	MCEN-1024-110	54	Fall 2019
Chemistry for Materials and Energy Science	MCEN-1024-120	66	Fall 2019
Color	ATLS-4519/5519	22	Fall 2018
Chemistry for Materials and Energy Science	MCEN-1020	43	Spring 2018
Color	ATLS-4519/5519	11	Fall 2017

Independent Study Students	**Course Number**	**Semester**
Roan Gerrald (senior thesis)	CHEN-4010	Spring 2025
Jacqueline Rivera	ATLS-5900	Spring 2024
Neely Quirk	MCEN-4848	Fall 2023
Zoe Zeidler	MCEN-4848	Fall 2023
Femke Jannsen (senior thesis)	CHEN-4010	AY 2022/23
Ferin von Reich	ATLS-4900-906	Spring 2021
Jackson Pope	MCEN-6848-900	Spring 2021
Justin Hall	MCEN-4848-924	Fall 2020
Sophie Adams	ATLS-4900-901	Spring 2020
Kailey Shara	ATLS-7900-904	Spring 2020

Aya Ishikawa	MCEN-4848-905	Spring 2019
Kailey Shara	ATLS-5900-901	Summer 2018
Phillip Vo	MCEN-4848-905	Spring 2018

INVITED TALKS

51. Biomedical Tattoos: Past, Present, Future — 2 November 2026
Department of Dermatology Grand Rounds, CU Anschutz Medical Campus

50. Threading the Needle: From Nanomachinery to Smart Tattoos — 12 October 2026
Colorado State University School of Biomedical & Chemical Engineering

49. Smart Plastics for Sustainability — 9 October 2026
Sustainability Research Summit, University of Colorado Boulder

48. A machine or not a machine? That is the question. — 21 July 2026
Molecular Rotors, Motors, and Switches Workshop, Telluride, Colorado

47. What is a molecular machine? Down the rhetorical rabbit hole. — 25 June 2025
Gordon Research Conference: Molecular Machines in Action (New London, NH)

46. Engineering the Tattoo Inks of the Future — 9 May 2025
World Congress on Tattoo and Pigment Research (Rome, Italy)

45. Integrating Molecular Machinery in Smart Materials — 4 April 2025
University of Wyoming Materials Science Seminar

44. Engineering a Path Out of the Plastics Crisis — 13 February 2025
Frontiers of Research Series, Highland Institute, (Boulder, Colorado)

43. Magic Ink — 24 October 2024
CEAS Leading with Impact: Innovation & Entrepreneurship (Broomfield, CO)

42. Harnessing the Power of Nanomachines in Smart Materials — 26 September 2024
ME Promotion Seminar (University of Colorado Boulder)

41. Using Molecular Nano-Pulleys to Dissipate Stress in Bio-Friendly Soft Materials — 15 August 2024
CU Boulder Innovation in Materials Science Symposium (Boulder, Colorado)

40. Integrating Molecular Machinery in Smart Materials: From Adhesives to Tattoos — 16 February 2024
ACS Chicago Section Meeting (Virtual Talk)

39. How Nanotechnology will Transform Tattoos — 27 November 2023
Radically Tender Tattoo Seminar, Berlin, Germany (Virtual Talk)

38. Smart Tattoos for Human Health — 28 September 2023
Douglas County Vintage & Vibrant Seniors Event (Parker, Colorado)

37. Research in the Emergent Nanomaterials Lab — 13 September 2023
TTI Vanguard Field Trip (Boulder, Colorado)

36. How Nanotechnology will Transform Tattoos — 9 September 2023
17th BMXNet Conference (Berlin, Germany)

35. How Nano- and Microtechnology will Transform Tattoos — 13 June 2023
127th AFDO Educational Conference (Norfolk, VA)

34. Intradermal Smart Tattoos Converging Nanoscience and Body Art — 14 April 2023
Molecular & Cellular Biology Symposium (University of Washington)

33. Active Nanomaterials Powered by Nanomachines: From Smart Adhesives to Smart Tattoos. *University of Denver Department of Chemistry Seminar* — 19 January 2023

32. Cobots in the Chemical R&D Lab — 5 December 2022
HUMAIN Future Lab Virtual Keynote, Ruhr-Universität Bochum

31. HYPRSKN: The Future of Skin — 19 May 2022
CatalyzeCU Guest Speaker Series

30. Finding Applications for Molecular Machines: Smart Adhesives to Smart Tattoos — 13 May 2022
Northwestern University Undergraduate Chemistry Council Colloquium

29. Tuning the unusual stress dissipation & actuation properties of slide-ring networks — 28 April 2022
2022 Boulder Workshop on Soft & Active Matter Mechanics

28. Unleashing the Power of Nanomachines — 12 April 2022
Paul M. Rady Dept. of Mechanical Engineering Strategic Advisory Board Meeting

27. Tattoos for Human Health: The Future of Smart Tattoos — 7 April 2022
Swedish American Historical Museum (Virtual)

26. Smart Tattoos 31 March 2022
Teen Café, Lafayette Public Library

25. Biomedical Smart Tattoos 8 November 2021
6th USERN Conference, Istanbul, Turkey

24. Unleashing the Power of Molecular Nanomachines 15 October 2021
ATLAS Institute Annual Board of Directors Meeting

23. Tattoo Ink: Past, Present, Future 30 September 2021
Susquehanna University Honors Colloquium, Selinsgrove, PA

22. Biomedical Applications of Tattoos 16 June 2021
125th Annual Association of Food and Drug Officials Education Conference

21. Molecular Nanoengineering of Functional Materials 4 February 2021
Brigham Young University Cheminar

20. Self-Assembling and Interlocking Polycyclic Aromatic Hydrocarbons. 22 October 2020
ChemPhysChem 2nd Virtual Seminar

19. Biomedical Tattoos for Human Health. 15 April 2020
University of Zurich Department of Chemistry Seminar

18. Smart Tattoos (https://youtu.be/wULG5olhbLA) 27 February 2020
CU Boulder NEXT Bufftalk, New York, NY, USA

17. Tattoos for Health: The Future of Smart Tattoos 24 November 2019
Vesterheim Museum Fall Lecture Series, Luther College, Decorah, IA

16. Biomedical Tattoos for Human Health 17 October 2019
CU Anschutz School of Pharmacy Graduate Seminar

15. The Future of Tattoos 28 September 2019
Colorado Tattoo Convention & Expo, Denver, CO

14. Cultivating Creativity 27 September 2019
ACTIVE Faculty Development and Leadership Program, CU Boulder

13. Chameleon Tattoos 25 September 2019
Teen Science Café, Belmar Library, Lakewood, CO

12. Creativity in Biomedical Research 15 September 2019
Boettcher Biomedical Summit, Denver, CO

11. Beyond Wellness Wearables: Get Ready for Smart Tattoos 12 September 2019
me Convention by SXSW / Mercedes-Benz, Frankfurt, Germany

10. Could a Tattoo Help You Stay Healthy? go.ted.com/carsonbruns 1 December 2018
TEDxMileHigh, Denver, Colorado ***>900,000 Views (YouTube + TED.com)***

9. Passionate Optimization (co-presented with Ben Shapiro) 1 November 2018
ACTIVE Faculty Development and Leadership Program, CU Boulder

8. Skin 19 October 2018
Todd Reed Salon Series, Boulder, CO

7. Tech Tattoos: Tissue Engineering with Dermally Implanted Nanomaterials.
International Symposium on Advanced Molecular Sciences 10 October 2018
East China University of Science and Technology, Shanghai, China

6. Leveraging Artificial Molecular Machines in Active Soft Matter Systems
CU Boulder Active Matter Workshop, Boulder, Colorado 10 August 2018

Prior to CU:

5. Biochemical Applications of Rotaxanes
Molecular Rotors, Motors, and Switches Conference. 21 July 2016
Telluride Science Research Center, Telluride, Colorado

4. Host-Guest Chemistry Inside of Large, Self-Assembled Molecular Flasks
5th Interdisciplinary Science Forum of the JSPS-US-AA 7 November 2014
The University of Florida, Gainesville

3. Emergent Ion-Gated Binding of Host-Guest Complexes Within $M_{12}L_{24}$ Molecular Flasks
248th ACS National Meeting and Exposition, San Francisco 13 August 2014

2. The Art and Science of (re)Presentation and the Mechanical Bond
Molecular Rotors, Motors, and Switches Workshop. 1 July 2014
Telluride Science Research Center, Telluride, Colorado, USA

1. Self-Assembly of Organic-Inorganic Hybrids
Northwestern University Department of Chemistry Organic Seminar 1 March 2011

POSTERS (All Prior to CU)

9. **Bruns, C. J.**; Liu, H.; Finbloom, J. A.; Slack, C. C.; Jeong, K.; Wemmer, D. E.; Pines, A.; Francis, M. B. Utilizing the Mechanical Bonds of Rotaxanes in Bioconjugation and Controlled Release
11th International Symposium on Macrocyclic & Supramolecular Chemistry (ISMSC), Seoul, South Korea 10–14 July 2016
8. **Bruns, C. J.**; Liu, H.; Francis, M. B. Protein Mounted Rotaxanes.
10th International Symposium on Macrocyclic & Supramolecular Chemistry (ISMSC), Strasbourg
Selected as a winner of the Springer ISMSC2015 Poster Prize 28 June–2 July 2015
7. **Bruns, C. J.**; Frasconi, M.; Zhu, Z.; Sluysmans, D.; Stupp, S.; Duwez, A.-S.; Stoddart, J. F. Rotaxane-Based Molecular Muscles 7–12 June 2015
Gordon Research Conference on Artificial Molecular Switches and Motors, Easton, MA, USA
6. **Bruns, C. J.**; Frasconi, M.; Zhu, Z.; Sluysmans, D.; Stupp, S.; Duwez, A.-S.; Stoddart, J. F. Rotaxane-Based Molecular Muscles
2015 MRS Spring Meeting, San Francisco, USA 6–10 April 2015
5. **Bruns, C. J.**; Stoddart, J. F. Molecular Switches and Machines with Mechanical Bonds
Molecular Rotors, Switches, and Machines Workshop, Telluride Science Research Center, Telluride, Colorado, USA 30 June–4 July 2014
4. **Bruns, C. J.**; Frasconi, M.; Li, J.; Schneebeli, S. T.; Iehl, J.; Jacquot de Rouville, H.-P.; Hartlieb, K. J.; Cheng, C.; Stupp, S. I.; Voth, G. A.; Stoddart, J. F. Donor-Acceptor Daisy Chain Rotaxanes: Thermally and Electrochemically Switchable Molecular Muscles 16–17 December 2013
RSC Macrocyclic and Supramolecular Chemistry Meeting. University of Glasgow, Scotland
3. **Bruns, C. J.**; Tayi, A. S.; Stupp, S. I.; Stoddart, J. F. From Switchable Mechanical Molecules to Artificial Muscles
DOE Non-Equilibrium Energy Research Center Review. Baltimore, MD, USA 5 April 2012
2. **Bruns, C. J.**; Fahrenbach, A. C.; Fujita, D.; Basu, S.; Fujita, M.; Stoddart, J. F. Pseudorotaxanation Within an Electrostatically-Gated $M_{12}L_{24}$ Coordination Sphere.
5th International Symposium on Macrocyclic & Supramolecular Chemistry (ISMSC), Nara, Japan
Selected as a winner of the Springer ISMSC2010 Poster Prize 6–10 June 2010
1. **Bruns, C. J.**; Thasana, N. Cu^{I}-Mediated Microwave-Assisted Synthesis of Azalamellarins
235th National ACS Meeting. New Orleans, Louisiana, USA 6–10 April 2008

PROFESSIONAL MEMBERSHIPS

Phi Beta Kappa Honors Society	Inducted 2008
Phi Lambda Upsilon Honorary Chemical Society, *Alpha Gamma Chapter*	Inducted 2010
JSPS-US Fellows Alumni Association	Inducted 2013
American Chemical Society	2011–Present
Materials Research Society	2015–Present
American Institute of Chemical Engineers	2015–Present
The Society of Rheology	2019–Present

SERVICE

Department / Unit Service

Chair, Graduate Committee, ATLAS Institute	AY 22/23–25/26
Graduate Committee, Biomedical Engineering Program	AY 23/24 & 24/25
DEI Committee, Rady Dept. of Mechanical Engineering	AY 22/23–25/26
ATLAS Faculty Search Committee	Spring 2024
External Relations Committee, Rady Dept. of Mechanical Engineering	2020–2021
Graduate Committee, ATLAS Institute	2020–present
MCEN Materials Science Preliminary Exam Committee Lead	2019, 2020

ATLAS Executive Committee	2018–2020
Chair, Graduate Engineering Annual Research & Recruitment Symposium	AY 2019/20
Vice Chair, Graduate Engineering Annual Research & Recruitment Symposium	AY 2018/19
CU Boulder Department of Mechanical Engineering Graduate Committee	2018–2020
ATLAS Institute ARPAC Self-Study Committee	AY 2017/18
Miller Institute Multidisciplinary Symposium Planning Committee	AY 2015/16
Northwestern Gelowitz Award Selection Committee	May 2013

College / University Service

Advisory Board, Prospects of Soft Matter Student Club	AY 2021/22
Art is Engineering Pop-Up Workshop, Engineering Center Lobby	3 Mar 2020
ACTIVE Faculty Development Program, Speaker / Advisor	2018, 2019
BOLD Center Partner: Goldshirt interviews, Research 101, Bring Bold Out	2018,2021
Engineering Design Expo Judge	8 Dec 2018
CU Boulder CEAS Soft Materials Faculty Search Committee	AY 2017/18

Professional Service

Chair, IUPAC Task Group on Molecular Machine Terminology	May 2024-present
ad hoc proposal reviewer for NSERC (Canada)	Jan 2025
NSF Panelist (DMR / LEAPS-MPS, Panel ID P212676)	July 2021
Topic Collection Editor, *Frontiers in Chemistry*	2021–2022
Advisory Board, *Vantis Institute*	2020–present
Editorial Board, *Symmetry* Journal	2019–2020
ad hoc proposal reviewer for ACS Petroleum Research Fund	2018, 2022
ad hoc proposal reviewer for U.S. Department of Energy	2020–2021
ad hoc proposal reviewer for Swiss National Science Foundation	2020

Refereed for (alphabetical): *Accounts of Chemical Research, ACS Applied Materials & Interfaces, ACS Macro Letters, ACS Nano, Acta Biomaterialia, Advanced Functional Materials, Advanced Materials, Advanced Science, Advanced Sensor Research, Angewandte Chemie, Biomicrofluidics, Chemical Science, ChemPlusChem, Chemistry, Chinese Chemical Letters, Environmental Science: Nano, Gels, Journal of Chemical Physics, Journal of Industrial and Engineering Chemistry, Journal of Organic Chemistry, Journal of Physical Chemistry, Journal of the American Chemical Society, Laser & Photonics Reviews, Macromolecules, Materials, Molecules, Nano-Micro Letters, Nanomaterials, Nature Chemistry, Nature Communications, Nature Nanotechnology, New Journal of Chemistry, Organic Letters, Pharmaceutics, Plos ONE, Proceedings of the National Academy of Sciences (PNAS), Polymers, Processes, Progress in Polymer Science, Science, Science Advances, Small, Soft Matter, Symmetry*

CREATIVE WORKS

Selected works at carsonbruns.com

- *Pixel Pushing* (2007–2019): digital works including lines & curves, false color, word play, space play
- *Spirit Animals* (2016–now): false-color wildlife murals, paintings, animations in acrylic
- *Wildflash* (2017–now): nature-inspired tattoos inked in standard + experimental photochromic ink
- *Pour Decisions* (2018–now): pigmented epoxy whose patterns self-organize as it flows and cures
- *Arboretics* (2024–now): treenets, woven platforms of tensioned paracord webbed between trees
- *MorphogenR8* (2026–now): reaction-diffusion simulation software that grows living halftone imagery

MEDIA RECOGNITION / PRESS COVERAGE

News: *CNN*, *BBC Newshour*, *NPR Marketplace*, *The Conversation*, *New York Post*, *Chemical & Engineering News* (*x2*, *x3*), *ACS Central Science*, *Denver Post*, *Newsy*, *Daily Mail* (*x2*), *Hindustan Times*, *NRC Handelsblad*, *CU Boulder Today* (*x2*), *Deutsche Welle*, *Axios*, *Global Cosmetics News*, *Drug Discovery News*, *Live Science*, *New Scientist*, *Talker*, *Nine News*, *Brighter Side of News*, *The Times*, *Nature News*

Magazines & Blogs: *People*, *Inked* (x2), *Chemistry World* (x2), *Elements*, *The Rooster*, *The Coloradan*, *GQ*, *Diversity in Action*, *TED^{x}MileHigh*, *ThinkBig*, *Philosophical Magazine*, *The Scientist*, *Popular Science*, *Boing Boing*, *Business Den*, *Techlicious*, *Interesting Engineering*

Radio / podcasts: *Colorado Public Radio*, *The Disruptors*, *Underfutures*, WORT Madison, *KUNC*, ABC Radio Tasmania, *Discovery Arc*, *Drew Duglan Podcast*

Television / Video: *The History Channel*, *Denver CBS 4 News*, *Denver 7 News*, *ATLAS Institute*, *BuffTalks*, *CatalyzeCU*, *Scripps News*, *American Chemical Society ACS 150*