ORION BOYD BERRYMAN

32 Campus Drive, Missoula, MT 59802 | (406) 243-4546 | orion.berryman@umontana.edu
Lab Website: http://hs.umt.edu/chemistry/lab/berryman/

EMPLOYMENT

University of Montana, Missoula
Associate Professor **2018 – pres.**
Department of Chemistry and Biochemistry
Director of Small Molecule X-ray Diffraction Facility
Center for Biomolecular Structure and Dynamics
MUS Material Science Program

University of Montana, Missoula
Assistant Professor **2012 – 2018**
Department of Chemistry and Biochemistry

The Scripps Research Institute, La Jolla, CA
Postdoctoral researcher (Mentor: Julius Rebek Jr.) **2008 – 2012**
The Skaggs Institute for Chemical Biology

EDUCATION

University of Oregon, Eugene
Ph. D. in Organic Chemistry (Advisor: Darren W. Johnson) **2003 – 2008**
GPA 3.95

University of New Hampshire, Durham **1999 – 2003**
B.A. in Organic Chemistry
Magna Cum Laude
GPA 3.59
Minor: Music – Trumpet

FUNDING

NSF CAREER – Halogen Bonding Catalysts **2016 – 2021**
- Berryman, Lead P.I. $675,000

MREDI Research Initiative – Instrumentation for Water Quality Monitoring **2015**
- Berryman, Co-P.I. $319,054

NSF Major Research Instrumentation program – Single Crystal X-ray Diffractometer **2013**
- Berryman, lead P.I. $378,571

NIH subproject of grant 8P20GM103546-02 (CoBRE) **2012**
University of Montana Start-up funds **2012**
NIH Ruth L. Kirschstein Postdoctoral Fellowship **2010 – 2012**
Skaggs Postdoctoral Fellow **2008 – 2009**
NSF Integrative Graduate Education and Research Traineeship (IGERT) **2005 – 2008**
University of Oregon Research Associate **2003 – 2005**
UNH Summer Undergraduate Research Fund (SURF) **2002 – 2003**

AWARDS

Invited to chair Rising Star symposium at International Symposium on Halogen Bonding	**2018**
Research highlighted on the SciShow interview "Molecular Architecture" https://www.youtube.com/watch?v=0qpZdri0zEc	**2017**
Research highlighted in Atlas of Science "Halogen Bonding Assembly of an Iodide-Binding Triple Helix" https://atlasofscience.org/halogen-bonding-assembly-of-an-iodide-binding-triple-helix/#more-20385	**2017**
Invited to chair microsymposium at the 24th IUCr – Hyderabad, India	**2017**
Invited Seminar at UO – Eugene, OR	**2017**
Research highlighted on the SciShow talk show "Building New Molecules" https://www.youtube.com/watch?v=zmI_aKumRrk	**2016**
Rising Star Honorarium at the ISXB conference – Gothenburg, Sweden	**2016**
Invited article in Acta Crystallographica Section B special issue on halogen bonding	**2016**
Invited Seminar at EWU – Cheney, WA	**2016**
Invited Seminar at Montana State University – Bozeman, MT	**2016**
Invited chapter in "Aspects of Multi-Component Crystals: Synthesis, Concepts and Function"	**2016**
Invited Seminar at Pacifichem 2015 – Honolulu, HI	**2015**
Invited chapter in *Comprehensive Supramolecular Chemistry 2nd edition*	**2015**
Invited Seminar at University of Wisconsin – Eau Claire, WI	**2015**
Invited Seminar at University of New Hampshire – Durham, NH	**2014**
Invited Seminar at Washington State University – Pullman, WA	**2014**
Keynote Speaker Local ACS meeting – Helena, MT	**2014**
Cottrell Scholar New Faculty Workshop – Washington, D.C.	**2013**
Invited *Israel Journal of Chemistry* Review Article	**2011**
SOF Travel Grant – March 2012, ACS National Meeting	**2011**
Invited *Chemical Science* Article	**2010**
Invited *Chemical Communications* Feature Article	**2009**
Top chemistry oral presentation – TSRI Fall Research Symposium	**2010**
Travel grant – ISMSC in Salice Terme, Italy	**2007**
Invited collaborative oral presentation at the Materials Science Retreat	**2006**
Dean's List – University of New Hampshire	**2000 – 2003**
High Honors – University of New Hampshire	**2000 – 2003**

PEER-REVIEWED PUBLICATIONS

Total Publications (including book chapters): 42 h-index: 18 Cited 1211 times

*** Denotes corresponding author ‡ Both authors contributed equally**

PUBLICATIONS FROM INDEPENDENT WORK

12. Massena, C. J., Decato, D. A., **Berryman, O. B.*** "A Long-Lived Halogen-Bonding Anion Triple Helicate Accommodates Rapid Guest Exchange." *Angewandte Chemie International Edition*, **2018**, *57*, 16109-16113; DOI: 10.1002/anie.201810415

11. Riel, A. M. S.‡; Decato, D. A.‡; Sun J.; Massena, C. J.; Jessop, M. J.; **Berryman, O. B.*** "The Intramolecular Hydrogen Bonded–Halogen Bond: A New Strategy for Preorganization and Enhanced Binding." *Chemical Science*, **2018**, *9*, 5828–5836.

10. Decato, D. A.; **Berryman, O. B.***; "Simultaneous Halogen and Hydrogen Bonding to Carbonyl and Thiocarbonyl Functionality." In: Multi-component Crystals: Synthesis, Concepts and Function, Tiekink, E. R. T. and Zukerman-Schpector, J. (eds) **2018**, vol. 1, pp. 272-288, De Gruyter Publishers.

9. Wageling, N. B.; Decato, D. A.; **Berryman, O. B.*** "Steric Effects of pH Switchable, Substituted (2-pyridinium)urea Organocatalysts: a Solution and Solid Phase Study." *Supramolecular Chemistry*, **2018**, *30*, 1004–1010.

8. Sun, J.; Riel A. M. S.; **Berryman, O. B. *** "Solvatochromism and Fluoresence Response of a Halogen Bonding Anion Receptor." *New Journal of Chemistry*, **2018**, *42*, 10489–10492.

- Invited contribution to thematic issue on halogen bonding

7. Riel, A. M. S.; Wageling, N. B.; Decato, D. A.; **Berryman, O. B.*** "Anion-Arene Interactions and the Anion-π Phenomenon." In: Comprehensive Supramolecular Chemistry II, Atwood, J. L., (ed.) **2017**, vol. 1, pp. 149-184. Oxford: Elsevier.

6. Riel, A. M. S.; Jessop, M. J.; Decato, D. A.; Massena, C. J.; Nascimento, V. R.; **Berryman, O. B.*** "Experimental Evidence of Halogen Bond Hard-Soft Acid Base Complementarity." *Acta Crystallographica Section B*, **2017**, *B73*, 203-209.

- Invited contribution to thematic issue on halogen bonding

5. Massena, C. J.; Wageling, N. B.; Decato, D. A.; Rodriguez, E. M.; **Berryman, O. B.*** "A Halogen Bond Induced Triple Helicate Encapsulates Iodide." *Angewandte Chemie International Edition* **2016**, *55*, 12398-12402.

- Cover art and UM press release, featured by NSF EPSCoR/IDeA Foundation, SciShow, Montana Associated Technology Rountables, Montanan Magazine, UM President's Report, UM We Are Montana tour, highlighted in Atlas of Science

4. Riel, A. M. S.; Decato, D. A.; **Berryman, O. B.*** "Protonation and Alkylation Induced Multidentate C–H•••Anion Binding to Perrhenate." *Crystal Growth and Design*, **2016**, *16*, 974-980.

3. Wageling, N. B.‡; Neuhaus, G. F.‡; Rose, A. M.; Decato, D. A.; **Berryman, O. B.*** "Advantages of Organic Halogen Bonding for Halide Recognition." *Supramolecular Chemistry*, **2016**, *28, 665-672*.

2. Massena, C. J.; Riel, A. M. S.; Neuhaus, G. F.; Decato, D. A.; **Berryman, O. B.*** "Solution and Solid-Phase Halogen and C-H Hydrogen Bonding to Perrhenate." *Chemical Communications*, **2015**, *51*, 1417-1420.

1. Decato, D. A.; **Berryman, O. B.*** "Crystal Structure of [1,1':3',1''-Terphenyl]-2',3,3''-Tricarboxylic Acid." *Acta Crystallographica Section E*, **2015**, *E71*, o667-o668.

PUBLICATIONS FROM PhD and POST-DOC

30. Tresca, B. W.; **Berryman, O. B.**; Zakharov, L. N.; Johnson, D. W.; Haley, M. M. "Anion-Directed Self-Assembly of a 2,6-bis(2-Anilinoethynyl)pyridine Bis(amide) scaffold." *Supramolecular Chemistry*, **2016**, *28,* 37-44. (invited for special issue in honor of Jonathan L. Sessler)

29. **Berryman, O. B.**; Johnson, C. A.; Vonnegut, C. L.; Fajardo, K. A.; Zakharov, L. N.; Johnson, D. W.; Haley, M. M. "Solid-State Examination of Conformationally Diverse Sulfonamide Receptors Based on Bis(2-anilinoethynyl)pyridine, -Bipyridine, and -Thiophene." *Crystal Growth and Design*, **2015**, *15*, 1502-1511.

28. Sather, A. C.; **Berryman, O. B.**; Rebek, J. Jr. "Selective Recognition and Extraction of the Uranyl Ion from Aqueous Solutions with a Recyclable Chelating Resin." *Chemical Science*, **2013**, *4*, 3601-3605.

27. Sather, A. C.; **Berryman, O. B**.; Moore, C. E.; Rebek, J. Jr. "Uranyl Ion Coordination with Rigid Aromatic Carboxylates and Structural Characterization of their Complexes." *Chemical Communications*, **2013**, *49*, 6379-6381.

26. Collins, M. S.; Carnes, M. E.; Sather, A. C.; **Berryman, O. B.**; Zakharov, L. N.; Teat, S. J.; Johnson, D. W. "Pnictogen-Directed Synthesis of Discrete Disulfide Macrocycles." *Chemical Communications*, **2013**, *49*, 6599-6601.

25. Sather, A. C.; **Berryman, O. B.**; Rebek, J. Jr. "Synthesis of Fused Indazole Ring Systems and Application to Nigeglanine Hydrobromide." *Organic Letters*, **2012**, *14,* 1600-1603.

24. **Berryman, O. B.**; Sather, A. C.; Lledo, A.; Rebek, J. Jr. "Switchable Catalysis with a Light Responsive Cavitand." *Angewandte Chemie International Edition*, **2011**, *50*, 9400-9403.

    - **Editor designated "hot paper"** for importance in a rapidly evolving field of high interest.

23. **Berryman, O. B.**; Sather, A. C.; Rebek, J. Jr. "A Deep Cavitand with a Fluorescent Wall Functions as an Ion Sensor." *Organic Letters*, **2011**, *13*, 5232-5235.

22. **Berryman, O. B.**; Dube, H.; Rebek, J. Jr. "Photophysics Applied to Cavitands and Capsules." *Israel Journal of Chemistry*, **2011**, *51*, 700-709.

    - **Invited review article**

21. Fontenot, S. A.; Cangelosi, V. M.; Pitt, M. A. W.; ***Sather, A. C.†***; Zakharov, L. N.; **Berryman, O. B.**; Johnson, D. W. "Design, Synthesis and Characterization of Self-Assembled As_2L_3 and Sb_2L_3 Cryptands." *Dalton Transactions*, **2011**, *40*, 12125-12131.

20. Gavette, J. V.; Lara, J.; **Berryman, O. B.**; Zakharov, L. N.; Haley, M. M.; Johnson, D. W. "Lithium Cation Enhances Anion Binding in a Tripodal Phosphine Oxide-Based Ditopic Receptor." *Chemical Communications*, **2011**, *47*, 7653-7655.

19. Carroll, C. N.; Coombs, B. A.; McClintock, S. P.; Johnson, C. A.; **Berryman, O. B.**; Johnson, D. W.; Haley, M. M. "Anion-Dependent Fluorescence in Bis(anilinoethynyl)pyridine Derivatives: Switchable ON-OFF and OFF-ON responses." *Chemical Communications*, **2011**, *47*, 5539-5541.

18. **Berryman, O. B.**; Sather, A. C.; Rebek, J. Jr. "A Light Controlled Cavitand Wall Regulates Guest Binding." *Chemical Communications,* **2011**, *47*, 656-658.

17. Sather, A. C.; **Berryman, O. B.**; Ajami, D.; Rebek, J. Jr. "Reactivity of *N*-nitrosoamides in Confined Spaces." *Tetrahedron Letters,* **2011**, *52*, 2100-2103.

16. Sather, A. C.; **Berryman, O. B.**; Rebek, J. Jr. "Selective Recognition and Extraction of the Uranyl Ion." *Journal of the American Chemical Society,* **2010**, *132*, 13572-13574.

15. Beer, S.**‡**; **Berryman, O. B.‡**; Ajami, D.; Rebek, J. Jr. "Encapsulation of the Uranyl Dication." C*hemical Science*, **2010**, *1*, 43-47.

    -***‡ Both authors contributed equally***. Highlighted in RSC press release, UK's Daily Telegraph, MSN news, Yahoo News and AOL news. Cover art.

14. Restorp, P.; **Berryman, O. B.**; Sather, A. C.; Ajami, D.; Rebek, J. Jr. *"*A Synthetic Receptor for Hydrogen Bonding to Fluorines of Trifluoroborates*." Chemical Communications,* **2009***, 0*, 5692-5694.

13. Johnson, C. A.; **Berryman, O. B.**; Sather A. C.; Zakharov, L. N.; Haley, M. M.; Johnson, D. W. *"*Anion Binding Induces Helicity in a Hydrogen Bonding Receptor: Crystal Structure of a 2,6-Bis(anilinoethynyl)pyridinium Chloride.*" Crystal Growth and Design,* **2009***, 9*, 4247-4249.

12. **Berryman, O. B.**; Johnson, D. W. *"*Experimental Evidence of Interactions Between Anions and Electron-Deficient Aromatic Rings.*" Chemical Communications,* **2009***, 0*, 3143-3153.

    - **Invited feature article** and cover art.

11. Carroll, C. N.; **Berryman, O. B.**; Johnson, C. A.; Zakharov, L. N.; Haley, M. M.; Johnson, D. W. *"*Protonation Activates Anion Binding and Alters Binding Selectivity in New Inherently Fluorescent 2,6-bis(2-anilinoethynyl)pyridine Bisureas*." Chemical Communications,* **2009**, *0*, 2520-2522*.*

10. **Berryman, O. B.**; Sather, A. C.; Meisner, J. S.; Hay, B. P.; Johnson, D. W. *"*Solution Phase Measurement of Both Weak Sigma Complexes and C-H•••X^- Hydrogen Bonding Interactions in a Synthetic Receptor.*" Journal of the American Chemical Society*, **2008***, 130,* 10895-10897*.*

9. **Berryman, O. B.**; Johnson, C. A.; Zakharov, L. N.; Haley, M. M.; Johnson, D. W. *"*Water and Hydrogen Halides Serve the Same Structural Role in a Series of 2+2 Hydrogen-Bonded Dimers Based on 2,6-bis(2-anilinoethynyl)pyridine Sulfonamide Receptors*." Angewandte Chemie International Edition,* **2008***, 47*, 117-120.

8. Shultz, G. V.; **Berryman, O. B.**; Zakharov, L. N.; Tyler, D. R. *"*Preparation of Photodegradable Polymers Containing Metal-Metal Bonds Using ADMET.*" Journal of Inorganic and Organometallic Polymers and Materials*, **2008***, 18,* 149-154.

7. **Berryman, O. B.**; Bryantsev, V. S.; Stay, D. P.; Johnson, D. W.; Hay, B. P. "Structural Criteria for the Design of Anion Receptors: the Interaction of Halides with Electron-Deficient Arenes*.*" *Journal of the American Chemical Society*, **2007***, 129*, 48-58.

    - UO Press release – December 2006, **cited 231 times**, Web of Science highly cited paper.

6. Rather Healey, E.; Vickaryous, W. J.; **Berryman, O. B.**; Johnson, D. W. *"*Self-Assembled Supramolecular Main Group Coordination Complexes" in BOTTOM-UP NANOFABRICATION: Supramolecules, Self-Assemblies, and Organized Films*." Ariga, K., Nalwa, H. S., Eds.; American Scientific Publishers: Stevenson Ranch,* **2007***.*

5. Meisner, J. S.; **Berryman, O. B.**; Zakharov, L. N.; Johnson, D. W. "Methyl 4-bromo-3,5-dinitrobenzoate*.*" *Acta Crystallographica Section E,* **2007**, *63*, o2466.

4. Cangelosi, V. A.; Sather, A. C.; Zakharov, L. N.; **Berryman, O. B.**; Johnson, D. W. "Diastereoselectivity in the Self-Assembly of $As_2L_2Cl_2$ Macrocycles is Directed by the As-π Interaction*.*" *Inorganic Chemistry,* **2007***, 46*, 9278-9284*.*

3. **Berryman, O. B.**; Hof, F.; Hynes, M. J.; Johnson, D. W. "Anion-π Interaction Augments Halide Binding in Solution." *Chemical Communications,* **2006**, *0*, 506-508.

2. Johnson, C. A.; Baker, B. A.; **Berryman, O. B**.; Zakharov, L. N.; O'Connor, M. J.; Haley, M. M. "Synthesis and Characterization of Pyridine- and Thiophene-Based Platinacyclyne." *Journal of Organometallic Chemistry,* **2006***, 691*, 413-421.

1. Vickaryous, W. J.; Healey, E. R.; **Berryman, O. B**.; Johnson, D. W. "Synthesis and Characterization of Two Isomeric, Self-Assembled Arsenic-Thiolate Macrocycles*.*" *Inorganic Chemistry,* **2005**. *44*, 9247-9252.

PATENTS

I. Lohrman, J.; Riel A. M. S.; Decato, D. A.; Haley, M.; Johnson, D. W.; **Berryman, O. B.**; "Fluorescent Halogen Bonding Arylethynyl Scaffolds for Anion Recognition." Application No. 62/671,280, filed May 14, **2018**.

II. Berryman, O. B.; Massena, C. J. "A Halogen-Bond-Induced Triple Helicate Encapsulates Iodide." Serial No. 62/362,226, filed July 14, **2016**.

III. Haley, M. M.; Johnson, D. W.; **Berryman, O. B.**; Johnson, C. A.; Stimpson, C. A. "Process for Preparation of Tunable Phenylacetylene Host Compounds for Ligand Binding." U.S. Pat. Appl. US 2008167472, **2008**, 21.

IV. Rebek, J. Jr.; **Berryman, O. B.**; Sather, A. C. "Methods and Compositions for Chelating Metals in Aqueous Solutions." US Pat. Application # 61/217,078, **2009**.

RESEARCH EXPERIENCE

University of Montana, Missoula, Montana – **Associate Professor** **2012 – pres.**

Halogen and Hydrogen Bonding Organocatalysts and anion receptors
Organic synthesis, characterization, single crystal X-ray diffraction, kinetics.

Self-Assembled Ligands for Uranium
Organic synthesis, characterization, self-assembly, single crystal X-ray diffraction, HPLC, LC-MS.

The Scripps Research Institute, La Jolla, California – **Advisor: Julius Rebek Jr.** **2008 – 2012**

Synthesis of neglanine hydrobromide – methods development for fused indazoliums
Organic synthesis, characterization, optimization, single crystal X-ray diffraction.

Light controlled catalysis of the Knoevenagel condensation
Organic synthesis, characterization, kinetics, photochemistry, UV-Vis/fluorescence, 2D NMR, ITC.

Tripodal receptors to probe weak B–F hydrogen bonds
Organic synthesis, characterization, equilibria studies.

Encapsulating uranium – carboxylate ligands and water extraction
Organic and inorganic synthesis, characterization, single crystal X-ray diffraction, extraction studies, ICP metal analysis.

University of Oregon, Eugene – **Advisor: Darren W. Johnson** **2003 – 2008**

New hydrogen bonding scaffolds for the recognition of small molecules
Organic synthesis, binding studies, X-ray diffraction.

Physical organic studies – the interaction of anions with electron-deficient aromatics
Organic synthesis, characterization, equilibria studies – WinEQNMR, Hunter software and DynaFit, crystallography, computational chemistry.

Probing guest interactions in arsenic – thiolate capsules
Inorganic synthesis, single crystal X-ray diffraction.

University of New Hampshire, Durham **2001 – 2003**

Synthesis of extended aromatics – towards controlled nanotube synthesis
Organic synthesis, characterization (NMR, IR, UV-vis, Mass spectrometry)

CONFERENCES

TALKS

Berryman, O. B. "Engineering Tiny Holes: Developing Molecules that Move Anions Inside of Cells." Abstracts of Papers, Montana University System Research Road Show, Missoula, Montana, October 24th, **2018**

Berryman, O. B.; Massena, C. J.; Riel, A. M. S.; Wageling, N. B.; Decato, D. A. "Halogen Bonding: A New Paradigm for Preorganization and Self-Assembly." Abstracts of Papers, 3rd International Symposium on Halogen Bonding, Greenville, South Carolina, June 10-14th, **2018**

Berryman, O. B. "Halogen Bonding Strategies for Catalysis and Supramolecular Assembly." Invited Seminar at University of Oregon, Eugene, OR, October 6th, 2017 – invited talk

Berryman, O. B. "Halogen Bonding Strategies for Catalysis and Supramolecular Assembly." Invited Seminar at University of Montana, Missoula, MT, March 14th, 2017 – invited talk

Berryman, O. B. "Halogen Bonding Strategies for the Assembly of Supramolecular Materials." MUS Materials Science Annual Meeting, Bozeman, MT, October 14th, 2016 – invited talk

Berryman, O. B. "A Halogen Bond Induced Triple Helicate Encapsulates Iodide." Abstracts of Papers, The Center for Biomolecular Structure and Dynamics, 5th annual CoBRE Research Retreat, Missoula, MT, United States, June 1st, **2015** – invited talk

Berryman, O. B. "A Halogen Bond Induced Triple Helicate Encapsulates Iodide." Abstracts of Papers, 2nd International Symposium on Halogen Bonding, Gothenburg, Sweden, June 6-10th, **2016 – *Rising Star honorarium***

Berryman, O. B.; Massena, C. J.; Riel, A. M. S.; Decato, D. A. "A Halogen Bond Induced Triple Helicate Encapsulates Iodide." Invited Seminar at Eastern Washington University, Cheney, WA, United States, April 28th, **2016** – invited talk

Berryman, O. B.; Riel, A. M. S.; Massena, C. J.; Neuhaus, G. F.; Wageling, N. B.; Decato, D. A. "Fundamental Studies of Bidentate Halogen Bond Donors for Supramolecular Catalysis." Invited Seminar at University of Wisconsin, Eau Claire, Eau Claire, WI, United States, October 16th, **2015** – invited talk

Berryman, O. B. "Synthetic Hydrogen and Halogen Bonding Oxyanion Holes." Abstracts of Papers, The Center for Biomolecular Structure and Dynamics, 4th annual CoBRE Research Retreat, Seeley Lake, MT, United States, September 13th, **2015** – invited talk

Berryman, O. B.; Riel, A. M. S.; Massena, C. J.; Neuhaus, G. F.; Wageling, N. B.; Decato, D. A. "Fundamental Studies of Bidentate Halogen Bond Donors for Supramolecular Catalysis." Invited Seminar at University of New Hampshire, Durham, NH, United States, June 29th, **2015** – invited talk

Berryman, O. B.; Riel, A. M. S.; Massena, C. J.; Neuhaus, G. F.; Wageling, N. B.; Decato, D. A. "Fundamental Studies of Bidentate Halogen Bond Donors for Supramolecular Catalysis." Invited Seminar at Washington State University, Pullman, WA, United States, March 2nd, **2015** – invited talk

Berryman, O. B.; Riel, A. M. S.; Massena, C. J.; Neuhaus, G. F.; Wageling, N. B.; Decato, D. A. "Synthesis, X-ray Structure and Preliminary Anion Binding Studies of Bis-Ethynyl Pyridinium Halogen Bonding Organocatalysts."

Abstracts of Papers, The Center for Biomolecular Structure and Dynamics, 3rd annual CoBRE Research Retreat, Seeley Lake, MT, United States, September 6th, **2014** – invited talk

Berryman, O. B. "Developing New Organocatalysts: Halogen Bonds in Action" Abstracts of Papers, Montana ACS Spring Meeting, Helena, MT, United States, April 12th, **2014** – Invited talk

Berryman, O. B. "Incorporating Halogen Bonding Interactions for Catalysis." Abstracts of Papers, The Center for Biomolecular Structure and Dynamics, 2nd annual CoBRE Research Retreat, Seeley Lake, MT, United States, August 18th, **2013** – invited talk

Berryman, O. B. "Catalysis with Noncovalent Interactions." Abstracts of Papers, The Center for Biomolecular Structure and Dynamics, 1st annual CoBRE Research Retreat, Seeley Lake, MT, United States, September 8th, **2012** – invited talk

Berryman, O. B.; Sather A. C.; Rebek, J. Jr. "Supramolecular Catalysis with a Light Responsive Cavitand." Abstracts of Papers, 243rd ACS National Meeting, San Diego, CA, United States, March 27th **2012**.

Berryman, O. B.; Sather, A. C.; Rebek, J. Jr. **"**Light Controlled Guest Binding in a Deep Cavitand." Abstracts of Papers, Pacifichem, Honolulu, HI, United States, December 15th, **2010**.

Berryman, O. B.; Beer, S.; Sather, A. C.; Rebek, J. Jr. **"**Encapsulation of the Uranyl Dication." Abstracts of Papers, Pacifichem, Honolulu, HI, United States, December 16th, **2010**.

Berryman, O. B.; Beer, S.; Sather, A. C.; Rebek, J. Jr. "Encapsulating the Uranyl Dication." Abstracts of Papers, TSRI Research Symposium, La Jolla, CA, United States, September 30th, **2010**.

Berryman, O. B.; Sather, A. C.; Rebek, J. Jr. **"**Light Controlled Guest Binding in a Deep Cavitand." Abstracts of Papers, 240th ACS National Meeting, Boston, MA, United States, August 25th, **2010**.

Berryman, O. B.; Beer, S.; Sather, A. C.; Rebek, J. Jr. **"**Encapsulation of the Uranyl Dication." Abstracts of Papers, 240th ACS National Meeting, Boston, MA, United States, August 25th, **2010**.

INVITED - Berryman, O. B.; Johnson, C. A.; Haley, M. M.; Johnson, D. W. "Guest-Induced Helical Dimerization of a Diverse Series of Hydrogen Bonding Receptors." Abstracts of Papers, MSI retreat, Gleneden Beach, Oregon, United States, December, 12-14th, **2006**.

Berryman, O. B.; Stay, D. P.; Johnson, D. W.; Bryantsev, V. S.; Hay, B. P. **"**Structural Criteria for the Design of Anion Receptors: Incorporating the Anion-π Interaction." Abstracts of Papers, 232nd ACS National Meeting, San Francisco, CA, United States, September 10-14th, **2006**.

POSTERS

Berryman, O. B.; Massena, C. J.; Riel, A. M. S.; Wageling, N. B.; Decato, D. A. "Halogen Bonding: A New Paradigm for the Self-Assembly of Higher-Order Anion Helicates." Abstracts of Papers, 13th International Symposium on Macrocyclic and Supramolecular Chemistry, Quebec City, Canada, July 8-13th, **2018**

Berryman, O. B.; Massena, C. J.; Riel, A. M.; Wageling, N. B.; Neuhaus, G. F.; Decato, D. A. **"**Fundamental Studies of Bidentate Halogen Bond Donors for Supramolecular Catalysis." Abstracts of Papers, Gordon Research Conference on Physical Organic Chemistry, Holderness, NH, United States, June 21-26th, **2015**.

Berryman, O. B.; Restorp, P.; Sather, A. C.; Rebek, J. Jr. **"**A Synthetic Receptor for Hydrogen-bonding to Fluorines of Trifluoroborates." Abstracts of Papers, Pacifichem, Honolulu, HI, United States, December 19th, **2010**.

Berryman, O. B.; Johnson, C. A.; Haley, M. M; Johnson, D. W. "Dimerization of a Hydrogen-Bonded 2,6-alkynylpyridyl Scaffold is Induced by Both Water and Anions." Abstracts of Papers, MSI retreat, Gleneden Beach, Oregon, United States, December, 11-13th, **2007**.

Berryman, O. B.; Meisner, J. S.; Stay, D. S.; Johnson, D. W.; Bryantsev, V. S.; Hay, B. P. "Structural Criteria for the Design of Anion Receptors; Incorporating the Anion-π Interaction." Abstracts of Papers, ISMSC International Meeting, Salice Terme, Italy, June 24-28th, **2007**.

Berryman, O. B.; Johnson, C. A.; Haley, M. M.; Johnson, D. W. "Dimerization of a Hydrogen-Bonded 2,6-alkynylpyridyl Scaffold is Induced by Both Water and Anions." Abstracts of Papers, ISMSC International Meeting, Salice Terme, Italy, June 24-28th, **2007**.

Berryman, O. B.; Stay, D. P.; Johnson, D. W.; Bryantsev, V. S.; Hay, B. P. "Structural Criteria for the Design of Anion Receptors; Incorporating the Anion-π Interaction." Abstracts of Papers, ISMSC International Meeting, Victoria, B.C. Canada, June 25-30th, **2006**.

Berryman, O. B.; Stay, D. P.; Johnson, D. W.; Bryantsev, V. S.; Hay, B. P. "Structural Criteria for the Design of Anion Receptors; Incorporating the Anion- π Interaction." Abstracts of Papers, Oregon Academy of Science Annual Meeting, Eugene, Oregon United States, February 26th, **2006**.

TEACHING EXPERIENCE

University of Montana

High School Students **2012 – pres.**

John Bower (Project SEED, 2016), Berit Blank

Undergraduates Mentored **2012 – pres.**

Neal Whaley, Erin McMahon, Geoffrey Glidewell, Alek Hierro, George Neuhaus, Casey Massena, Julia Allred, Christian McCurrdy, Hue Vu, Taymee Brandon, Evan McManigal, Alex Johnson, Ana Martin, Vinicius Nascimento, Morly Jessup, Christopher Grubb, Enrique Rodriguez, James May, Jacob Fromm, Curtis Williamson (Blackfeet community college), Heather Wiegert, Dylan Budke

Graduate Students **2012 – pres.**

Nick Wageling, Ariana Rose, Asia Riel, Daniel Decato, Casey Massena, Jiyu Sun, Eric John

Courses **2012 – pres.**

CHMY 697 Research
CHMY 690 Research
CHMY 630 Department Seminar
CHMY 599 Thesis
CHMY 597 Research
CHMY 595 Physical Organic Chemistry
CHMY 580 Supramolecular Research Survey
CHMY 562 Organic Structure and Mechanism
CHMY 595 Physical Organic Chemistry
CHMY 499 Senior Thesis
CHMY 492 Independent Study
CHMY 490 Undergraduate Research
CHMY 292 Independent Study
CHMY 222 Organic Chemistry I lab
CHMY 223 Organic Chemistry II

University of Oregon, Eugene

Students mentored **2004 – pres.**
A. C. Sather, J. S. Meisner, C. Ward, S. Rodriguez-Azirez

Laboratory teaching assistant – masters polymer internship course **2006 – 2007**
Course development, syllabus, responsible for laboratory preparation, cleanup and student safety

Laboratory teaching assistant –general Chemistry **2003**
Developed syllabus and weekly lecture, taught practical skills, responsible for student safety

Laboratory teaching assistant – organic chemistry **2003**
Developed syllabus and weekly lecture, taught practical skills, responsible for student safety

INTERNSHIP

Pacific Northwest National Laboratory **Fall/winter 2005**
Supervisor – Dr. Benjamin P. Hay
Computational chemistry.

COLLABORATORS

Dr. Benjamin P. Hay, Oak Ridge National Laboratory — quantum calculations and host designer program
Prof. Fraser Hof, University of Victoria — DFT calculations for anion/arene complexes
Profs. Darren W. Johnson and Michael M. Haley, University of Oregon — phenyl acetylene systems

MEMBERSHIPS/OUTREACH/INSTITUTIONAL INVOLVEMENT

Referee for (98 reviews total) *Angewandte Chemie, Journal of Organic Chemistry, Journal of the American Chemical Society, European Journal of Organic Chemistry, Chemical Communications, Dalton Transactions, Inorganic Chemistry, New Journal of Chemistry, RSC Advances, European Journal of Inorganic Chemistry, SIEPP, Chemistry A European Journal, Journal of Materials Chemistry C, Journal of Materials Chemistry A, Analytical Chemistry, CrystEngComm, Journal of Solution Chemistry, Journal of Chemistry, Journal of Inclusion Phenomenon and Macrocyclic Chemistry, American Chemical Science Journal, Acta Crystallographica Section B, IUCrJ, Crystal Growth & Design* **2011 – pres.**

Lead Faculty Development Workshop on running a successful research lab – UM **2018**
Reviewer for NSF – CHE division grants **2018**
Reviewer for Murdock grant program **2018**
Reviewer for ACS – ND grant program **2018**
Volunteer for We are Montana (3×, 34+ 8^{th} graders) **2017**
Reviewer for NSF – CHE division grants, panelist **2017**
Question Reviewer for ORAU National Science Bowl **2017**
Faculty Senate, University of Montana, member **2016 – pres.**
Volunteer at spectrUM “building with biology” day **2016**
Reviewer for NSF – MRI grant program **2016**
Reviewer for NSF – CHE division grants **2016**
Tribal college faculty rotation host for six faculty **2016**

Big Sky high school job shadow for five students	**2016 – pres.**
UM Bioinorganic faculty search committee	**2015**
UM Materials Science faculty search committee	**2015**
Reviewer for ACS – DNI grant program	**2015**
Chemistry demonstrations for spectrUM science museum (**250+ reached**)	**2012 – pres.**
ACS NORM 2014 symposium organizer "Small Forces Mountanous Outcomes"	**2014**
Unit Standards Review Committee member	**2013**
Graduate Recruitment Committee, Chair	**2012 – 2016**
NORM X-ray diffraction workshop organizer, Missoula, MT	**2014**
X-ray tutorial organizer UM	**2014**
Canadian Chemical Crystallography Workshop	**2014**
Organic and Crystallographer Faculty Search Committee (UO)	**2006**
Nano Quest Challenge 2006 – Judge	**2006**
University of Oregon Department Crystallographer	**2005**
American Chemical Society	**2004 – pres.**
Golden Key National Honour Society	**1999 – pres.**

STUDENT AWARDS

Daniel Decato – Bertha Morton Award	**2018**
Daniel Decato – Besancon Scholarship	**2018**
Casey Massena – Bertha Morton Scholarship	**2017**
Casey Massena – International finalist for 67th Lindau Nobel Laureate Chemistry Meeting	**2017**
Asia Riel – Chateaubriand Fellowship – International study in France	**2017**
Asia Riel – Rennes Métropole – International study in France	**2017**
Asia Riel – ACS Division of Organic Chemistry Travel Grant Spring ACS Meeting	**2017**
Asia Riel – UM Research and Creative Scholarship Travel Grant Spring ACS Meeting	**2017**
Morly Jessop – President's Recognition award	**2017**
James May – Dick Field Physical Chemistry award	**2017**
James May – General Chemistry award	**2017**
James May – William P. Cahill Memorial Scholarship	**2017**
Asia Riel – Lola Walsh Anacker Scholarship	**2016**
Dan Decato – Stanley R. Ames Scholarship	**2016**
Casey Massena – Besancon Scholarship	**2016 – 2017**
Casey Massena – Stanley R. Ames Scholarship	**2016**
Evan McManigal – General Chemistry Achievement Award	**2016**
Morly Jessup – Louis F. Kinney Award	**2016**
Chris Grubb – Richard H. Jesse Memorial Scholarship	**2016**
James May – 1st place undergraduate poster award, SD undergraduate research symposium	**2016**
Morly Jessup – General Chemistry Achievement Award	**2015**
Asia Riel – Bertha Morton Scholarship	**2015**
Nicholas Wageling – CBSD Graduate Research Fellowship	**AY 2014 – 15**
George Neuhaus – Watkins Scholarship	**AY 2013 – 15**
George Neuhaus – Lewis F. Kinney Award	**2014**
Geoffrey Glidewell – Physical Chemistry award	**2014**
George Neuhaus – UMCUR award for best poster presentation	**2013**

George Neuhaus – Richard H. Jesse Scholarship **2013**
Neal Whaley – Fessenden Organic Student award **2013**
Casey Massena – Chemistry alumni faculty award **2013**

REFERENCES

Available upon request