

# Christopher Nelson Shingledecker

(He/Him/His)  
Assistant Professor  
Department of Physics and Astronomy  
Benedictine College

1020 North 2nd Street,  
Atchison, KS 66002 USA  
☎ +1 (913) 360 7915  
✉ [cshingledecker@benedictine.edu](mailto:cshingledecker@benedictine.edu)  
🌐 <https://www.shingledecker.org>

## Employment

- 2020-present Assistant Professor of Physics and Astronomy, Benedictine College
- 2018-2020 Alexander von Humboldt Foundation Postdoctoral Research Fellow, Max Planck Institute for Extraterrestrial Physics
- 2013-2018 Graduate Research Student, University of Virginia

## Education

- 2018 **Doctor of Philosophy**, *University of Virginia*, Charlottesville, VA, *Physical Chemistry*
- 2013 **Bachelor of Science**, *University of Virginia*, Charlottesville, VA, *with Highest Distinction, ACS Certification, Distinguished Major Program*

## Publications and Metrics

### Publication Breakdown

- 42 Number of total refereed articles
- 3 Number of articles in *Science*-family journals
- 4 Number of articles in *Nature*-family journals

### Google Scholar Metrics

- 1891 Citations
- 24 h-Index
- 35 i10-Index

## Awards and Honors

- 2021 Benedictine College Teaching Excellence Award Nominee
- 2019 Coalition for Academic Scientific Computation (CASC) Research Highlight
- 2018 Alexander von Humboldt Foundation Postdoctoral Research Fellowship
- 2018 Adam Ritchie Outstanding Graduate Student Award
- 2018 PCCP HOT Article: A general method for the inclusion of radiation chemistry in astrochemical models

- 2017 PCCP HOT Article: A new model of the chemistry of ionizing radiation in solids: CIRIS
- 2017 Rao Prize, presented at the 73<sup>rd</sup> *International Symposium on Molecular Spectroscopy*
- 2017 NASA ROSES Proposal Writing Retreat Winner
- 2015 DOE NNSA Stewardship Science Graduate Fellowship: Honorable Mention
- 2013 Oscar R. Rodig Excellence in Chemistry Award

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## Links to Selected Research-Related Press

- Flatland KC [KC's Connection to the Heavens: Webb Telescope Images Trigger Elation](#)
- Nerdist [NEWLY ID'D SPACE MOLECULES GIVE INSIGHT INTO LIFE'S ORIGINS](#)
- Science News [Carbon-ring molecules tied to life were found in space for the first time](#)
- MIT News [Found in space: Complex carbon-based molecules](#)
- C&EN [PAHs lurking among the stars have now been identified](#)
- Ad Astra [Benedictine scientist is part of new discovery in interstellar space](#)
- Kansas [Molecular Clue to the Mystery of Carbon's Cosmic Origin Uncovered](#)
- Scientific American [Detecting the building blocks of aromatics](#)
- Science [Did life's building blocks form in interstellar ice? Cosmic rays can create molecules in frozen dust clouds between stars](#)
- Daily Mail [Benzonitrile: Organic Molecule Discovered in Space Smells Like Almonds](#)
- Newsweek [ALMA Radio Telescope is Searching the Stars With Its Highest-ever Frequencies](#)
- Discover Magazine [Radio telescope spots aromatic molecule for the first time](#)
- C&EN [Astronomers Detect Almond-Scented Molecule That Will Help Solve Interstellar Radiation Mystery](#)
- Gizmodo [ALMA's highest frequency receiver produces its first scientific result on massive star formation](#)
- Phys.Org [GBT detection unlocks exploration of 'aromatic' interstellar chemistry](#)
- Phys.Org [Models suggest cosmic rays can trigger reactions in interstellar ice balls causing formation of more complex molecules](#)

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## Professional Associations & Honor Societies

- International Astronomical Union - *Junior Member*
- Radiation Research Society - *Senior Scholar-in-Training*
- American Astronomical Society - *Full Member*

American Chemical Society - *Member*

Alpha Chi Sigma Chemistry Fraternity - *Professional Member*

Phi Beta Kappa Honor Society - *Member*

Mu Alpha Theta Honor Society - *Member*

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## Teaching

- ASTR 1300 **Sun and Solar System**, *Benedictine College*
- PHYS 1300 **Our Strange Universe**, *Benedictine College*
- NASC 1600 **The Origins of the Major Ideas of Science**, *Benedictine College*
- PHYS 2000 **College Physics I**, *Benedictine College*
- PHYS 2001 **College Physics I Lab**, *Benedictine College*
- PHYS 2010 **College Physics II**, *Benedictine College*
- PHYS 2011 **College Physics II Lab**, *Benedictine College*
- PHYS 2101 **Classical Physics I Lab**, *Benedictine College*
- PHYS 2111 **Classical Physics II Lab**, *Benedictine College*
- ASTR 4100 **Introduction to Astrophysics**, *Benedictine College*
- ASTR 4200 **Solar System Astrophysics**, *Benedictine College*
- PHYS 4200 **Mathematical Methods for Physics**, *Benedictine College*
- PHYS 4400 **Thermodynamics**, *Benedictine College*

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## Mentoring and Advising

### Graduate Students Advised

- Kristen Darnell (San Jose State U./NASA Goddard SFC)

### Graduate Students Mentored

- Sean Schulte (UVa), Dominique Maffucci, Ph.D. (UVa), Ci Xue (UVa), Jessica Tennis (UVa), Alec Paulive (UVa)

### Undergraduate Students Mentored

- Joseph Wandishin (BC), MaryEmma Schreffler (BC), Daniel Lopez-Sanders (BC), Garrett Nobis (BC), Yi Kang (BC), Hongji Wei (BC/Arizona), Faith Quinn (BC), Grace Quinn (BC), Ashley Wallau (BC), Virginia Jarvis (BC), Natalee Brake (BC), Joshua Mansfield (BC), Colin Donovan (BC), Aury Hay (Princeton), Ella Mullikin (Ga. Tech), Hannah Anderson (Wellesley), Natalie O'Hern (Wellesley), Viktoria Korn (Uni. Stuttgart), Alexander Thomas (UVa), Alexandra Pentel (UVa), Emmit Pert (UVa), Wyatt Ochs (UVa), Eric Rohr (UVa)

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## Selected Service Activities

### Internal BC Service

since 2021 Discovery Day Student Research Committee

since 2022 BC Experience Freshman Course Development Committee  
since 2020 Physics & Astronomy Department Colloquium Organizer  
since 2021 Daglen Observatory Open House Co-Organizer  
since 2021 Honors Retreat

#### Refereeing Duties

since 2017 ACS Earth & Space Chemistry  
since 2018 The Astrophysical Journal  
since 2018 Nuclear Instruments and Methods in Physics Research, Section B  
since 2019 Journal of Physical Chemistry  
since 2020 Astronomy & Astrophysics  
since 2020 Monthly Notices of the Royal Astronomical Society

#### Time Allocation Committee Memberships

2023 JWST Cycle 2, Subgroup: Stellar Populations

#### External Grant Reviewer

Since 2020 European Research Council  
Since 2021 Alexander von Humboldt Foundation  
Since 2020 NASA

#### Local Organizing Committees

2023 **2023 Mid-America Regional Astronomy Conference (MARAC)**, *Benedictine College*, Atchison, KS, USA, Nov 2023

#### Scientific Organizing Committees

2023 **2023 Mid-America Regional Astronomy Conference (MARAC)**, *Benedictine College*, Atchison, KS, USA, Nov 2023  
2017–2018 **14<sup>th</sup> Astrobiology Graduate Conference (AbGradCon)**, *Georgia Tech*, Atlanta, GA, USA, June 2018  
2016–2017 **13<sup>th</sup> Astrobiology Graduate Conference (AbGradCon)**, *University of Virginia*, Charlottesville, VA, USA, June 2017

#### Selected Presentations to the General Public

May 2021 Olathe High School - Olathe, KS  
Jan. 2021 Astronomical Society of Kansas City - Virtual  
May 2015 McCormick Observatory - Charlottesville, VA  
Oct. 2015 Fan Mountain Observatory - Coveseville, VA

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### Third-party Funding

2024-2026 **NASA RIA**, \$145,442, Pending  
2023-2024 **Space Telescope Science Institute**, \$28,968

- 2018 **Alexander von Humboldt Research Fellowship**, \$106,531.03  
2018 **Carl Friedrich von Siemens Fellowship**, \$9,279.86  
2019 **IAU Travel Grant**, \$648.49

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## Doctoral Thesis

Title *On Cosmic Rays in Astrochemical Models*  
Supervisor Eric Herbst

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## Selected Publications

### Book Chapters

- [1] **Shingledecker, C. N.**, Vogt-Geisse, S., Mifsud, D. V., & Ioppolo, S., Dust and Surface Chemistry, in *Astrochemical Modeling: Practical Aspects of Microphysics in Numerical Simulations*, eds. Bovino, S. & Grassi, T., Elsevier, 2023

### Invited Peer-Reviewed Articles

- [2] **Shingledecker, C. N.**, Banu, T., Kang, Y., Wei, H., Wandishin, J., Nobis, G., Jarvis, V., Quinn, F., Quinn, G., Molpecere, G., McCarthy, M. C., McGuire, B. A., Kaestner, J., Grain-Surface Hydrogen-Addition Reactions as a Chemical Link Between Cold Cores and Hot Corinos: The Case of H<sub>2</sub>CCS and CH<sub>3</sub>CH<sub>2</sub>SH, *Journal of Physical Chemistry A*, 126, 32, 5343-5353
- [1] **Shingledecker, C. N.** & Herbst, E., A general method for the inclusion of radiation chemistry in astrochemical models. *Physical Chemistry Chemical Physics*, 2018, 20

### Works as Senior Author

- [1] Anderson, H., O'Hern, N., Arumainayagam, C. R., Vasyunin, A., Majumdar, L., Gerakines, P. A., van Dishoeck, E., Caselli, P., & **Shingledecker, C. N.**, A New Method for Modeling UV-Driven Photoprocesses. *Astrophysical Journal*, 2020, 910, 72

### Works as First or Second Author

- [13] **Shingledecker, C. N.**, Lee, K. L. K., Wandishin, J. T., Balucani, N., Burkhardt, A. M., Charnley, S. B., Loomis, R., Schreffler, M., Siebert, M., McCarthy, M. C., McGuire, B. A. Detection of Interstellar H<sub>2</sub>CCC<sub>3</sub>HCN. *Astronomy & Astrophysics Letters*, 2021, 652, L12
- [12] Paulive, A., **Shingledecker, C. N.**, Herbst, E. The Role of Radiolysis in the Modelling of C<sub>2</sub>H<sub>4</sub>O<sub>2</sub> Isomers and Dimethyl Ether in Cold Dark Clouds. *Monthly Notices of the Royal Astronomical Society* 2021, 500 (3), 3414–3424.
- [11] **Shingledecker, C. N.**, Incerti, S., Ivlev, A., Emfietzoglou, D., Kyriakou, I., Vasyunin, A., Caselli, P. Cosmic-Ray Tracks in Astrophysical Ices: Modeling with the Geant4-DNA Monte Carlo Toolkit. *Astrophysical Journal* 2020, 904 (2), 189.

- [10] **Shingledecker, C. N.**, Lamberts, T., Laas, J., Vasyunin, A., Herbst, E., Kästner, J. K., & Caselli, P., Efficient Production of S<sub>8</sub> in Interstellar Ices: The effects of cosmic ray-driven radiation chemistry and non-diffusive bulk reactions. *Astrophysical Journal*, 2020, 888, 1
- [9] McGuire, B. A., **Shingledecker, C. N.**, Willis, E. R., Lee, K. L. K., Martin-Drumel, M. A., Blake, G. A., Brogan, C. L., Burkhardt, A. M., Caselli, P., Chuang, K. J., El-Abd, S., Hunter, T. R., Ioppolo, S., Linnartz, H., Remijan, A. J., Xue, C., & McCarthy, M. C., Searches for Interstellar HCCSH and H<sub>2</sub>CCS. *Astrophysical Journal*, 2019, 883, 2
- [8] Burkhardt, A. M., **Shingledecker, C. N.**, Le Gal, R. A., McGuire, B. A., Remijan, A. J., & Herbst, E., Modeling C-Shock Chemistry in Isolated Molecular Outflows. *Astrophysical Journal*, 2019, 881, 32
- [7] **Shingledecker, C. N.**, Alvarez-Barcia, S., Korn, V., & Kästner, J., The Case of H<sub>2</sub>C<sub>3</sub>O Isomers, Revisited: Solving the Mystery of the Missing Propadienone. *Astrophysical Journal*, 2019, 879, 2
- [6] **Shingledecker, C. N.**, Vasyunin, A., Herbst, E., & Caselli, P., On Simulating the Proton-Irradiation of O<sub>2</sub> and H<sub>2</sub>O Ices Using Astrochemical-Type Models, with Implications for Bulk Reactivity. *Astrophysical Journal*, 2019, 876, 2
- [5] **Shingledecker, C. N.**, Tennis, J., Le Gal, R., & Herbst, E., On Cosmic-Ray-driven Grain Chemistry in Cold Core Models. *Astrophysical Journal*, 2018, 861, 1
- [4] McGuire, B. A., **Shingledecker, C. N.**, Willis, E. R., Burkhardt, A. M., El-Abd, S., Motiyenko, R. A., Brogan, C. L., Hunter, T. R., Margules, L., Guillemin, J. C., Garrod, R. T., Herbst, E., & Remijan, A. J., ALMA Detection of Interstellar Methoxymethanol (CH<sub>3</sub>OCH<sub>2</sub>OH). *Astrophysical Journal, letters*, 2017, 851, 2
- [3] **Shingledecker, C. N.**, Le Gal, R. A., & Herbst, E., A new model of the chemistry of ionizing radiation in solids: CIRIS. *Physical Chemistry Chemical Physics*, 2017, 19, 18
- [2] Loomis, R. A., **Shingledecker, C. N.**, Langston, G., McGuire, B. A., Dollhopf, N. M., Burkhardt, A. M., Corby, J., Booth, S. T., Carroll, P. B., Turner, B., & Remijan, A. J., Non-detection of HC<sub>11</sub>N towards TMC-1: constraining the chemistry of large carbon-chain molecules. *Monthly Notices of the Royal Astronomical Society*, 2016, 463, 4
- [1] **Shingledecker, C. N.**, Bergner, J. B., Le Gal, R. A., Öberg, K. I., Hincelin, U., & Herbst, E., On the Inference of the Cosmic-ray Ionization Rate  $\zeta$  from the HCO<sup>+</sup>-to-DCO<sup>+</sup> Abundance Ratio: The Effect of Nuclear Spin. *Astrophysical Journal*, 2016, 830, 2

[Works as Contributing Author](#)

- [13] Bouwman, J., McCabe, M. N., **Shingledecker, C. N.**, Wandishin, J., Jarvis, V., Reusch, E., Hemberger, P., Bodi, A. Five-membered ring compounds from the ortho-benzyne + methyl radical reaction under interstellar conditions, *Nature Astronomy*, 2023, 7, 423-430
- [12] Yang, Y. L., Green, J. D., Pontoppidan, K. M., Bergner, J. B., Cleaves, L. I., Evans, N. J., Garrod, R. T., Jin, M., Kim, C. H., Kim, J., Lee, J. E., Sakai, N., **Shingledecker, C. N.**, Shope, B., Tobin, J., van Dishoeck, E. F., CORINOS. I. JWST/MIRI Spectroscopy and Imaging of a Class 0 Protostar IRAS 15398-3359, *Astrophysical Journal*, 2022, 941, L13
- [11] Wootten, A., Bentley, R. O., Combes, F., Fabian, F. C., Ferland, G. J., Loh, E., Salome, P., **Shingledecker, C. N.**, Castro-Carrizo, A., Dense Molecular Clouds in the Crab Supernova Remnant, *Astrophysical Journal*, 2022, 925, 59
- [10] Burkhardt, A. M., Loomis, R. A., **Shingledecker, C. N.**, Lee, K. L. K., Remijan, A. J., McCarthy, M. C., McGuire, B. A. Ubiquitous Aromatic Carbon Chemistry at the Earliest Stages of Star Formation. *Nature Astronomy* 2021, 5, 181–187.
- [9] Doddipatla, S., Galimova, G. R., Wei, H., Thomas, A. M., He, C., Yang, Z., Morozov, A. N., **Shingledecker, C. N.**, Mebel, A. M., Kaiser, R. I. Low-Temperature Gas-Phase Formation of Indene in the Interstellar Medium. *Science Advances* 2021, 7 (1)
- [8] Kleimeier, N. F., Abplanalp, M. J., Johnson, R. N., Gozem, S., Wandishin, J., **Shingledecker, C. N.**, Kaiser, R. I. Cyclopropanone (c-C<sub>3</sub>H<sub>2</sub>O) as a Tracer of the Nonequilibrium Chemistry Mediated by Galactic Cosmic Rays in Interstellar Ices. *Astrophysical Journal* 2021, 911 (1), 24.
- [7] Loomis, R. A., Burkhardt, A. M., **Shingledecker, C. N.**, Charnley, S. B., Cordiner, M. A., Herbst, E., Kalenskii, S., Lee, K. L. K., Willis, E. R., Xue, C., Remijan, A. J., McCarthy, M. C., McGuire, B. A. An Investigation of Spectral Line Stacking Techniques and Application to the Detection of HC<sub>11</sub>N. *Nature Astronomy* 2021, 5, 188–196.
- [6] McCarthy, M. C., Lee, K. L. K., Loomis, R. A., Burkhardt, A. M., **Shingledecker, C. N.**, Charnley, S. B., Cordiner, M. A., Herbst, E., Kalenskii, S., Willis, E. R., Xue, C., Remijan, A. J., McGuire, B. A. Interstellar Detection of the Highly Polar Five-Membered Ring Cyanocyclopentadiene. *Nature Astronomy* 2021, 5, 176–180.
- [5] McGuire, B. A., Loomis, R. A., Burkhardt, A. M., Lee, K. L. K., **Shingledecker, C. N.**, Charnley, S. B., Cooke, I. R., Cordiner, M. A., Herbst, E., Kalenskii, S., Siebert, M. A., Willis, E. R., Xue, C., Remijan, A. J., McCarthy, M. C. Detection of Two Interstellar Polycyclic Aromatic Hydrocarbons via Spectral Matched Filtering. *Science* 2021, 371 (6535), 1265–1269.

- [4] McGuire, B. A., Brogan, C. L., Hunter, T. R., Remijan, A. J., Blake, G. A., Burkhardt, A. M., Carroll, P. B., van Dishoeck, E. F., Garrod, R. T., Linnartz, H., **Shingledecker, C. N.**, & Willis, E. R., First Results of an ALMA Band 10 Spectral Line Survey of NGC 6334I: Detections of Glycolaldehyde (HC(O)CH<sub>2</sub>OH) and a New Compact Bipolar Outflow in HDO and CS. *Astrophysical Journal, letters*, 2018, 863, 2
- [3] McGuire, B. A., Burkhardt, A. M., Kalenskii, S., **Shingledecker, C. N.**, Remijan, A. J., Herbst, E., & McCarthy, M. C., Detection of the aromatic molecule benzonitrile (c-C<sub>6</sub>H<sub>5</sub>CN) in the interstellar medium. *Science*, 2018, 359, 6372
- [2] McGuire, B. A., Burkhardt, A. M., **Shingledecker, C. N.**, Kalenskii, S., Herbst, E., Remijan, A. J., & McCarthy, M. C., Detection of Interstellar HC<sub>5</sub>O in TMC-1 with the Green Bank Telescope. *Astrophysical Journal, letters*, 2017, 843, 2
- [1] Abplanalp, M. J., Gozem, S., Krylov, A. I., **Shingledecker, C. N.**, Herbst, E., & Kaiser, R. I., A study of interstellar aldehydes and enols as tracers of a cosmic ray-driven nonequilibrium synthesis of complex organic molecules. *Proceedings of the National Academy of Sciences*, 2016, 113, 28

#### Conference Proceedings

- [9] **Shingledecker, C. N.**, Vasyunin, A., Herbst, E., & Caselli, P., Radiation Chemistry in Astrochemical Models: From the Lab to the ISM. *IAU Symposium #350: Laboratory Astrophysics, from Observation to Interpretation*, 2019, 350
- [8] Burkhardt, A. M., **Shingledecker, C. N.**, Le Gal, R. A., McGuire, B. A., Remijan, A. J., & Herbst, E., Modeling Shock Chemistry in Isolated Molecular Outflows. *American Astronomical Society Meeting Abstracts #233*, 2019, 233
- [7] McGuire, B. A., Brogan, C. L., Hunter, T. R., Remijan, A. J., Blake, G., Burkhardt, A. M., Carroll, P. B., van Dishoeck, E., Garrod, R. T., Linnartz, H., **Shingledecker, C. N.**, & Willis, E. R., The Chemistry and Dynamics of Star-forming Regions Revealed with ALMA at Band 10: Water (HDO) Outflows and Complex Organic Line Forests with 300 au Resolution. *American Astronomical Society Meeting Abstracts #233*, 2019, 233
- [6] McGuire, B. A., Burkhardt, A. M., Kalenskii, S., **Shingledecker, C. N.**, Remijan, A. J., Herbst, E., & McCarthy, M. C., Detection of Interstellar Benzonitrile (c-C<sub>6</sub>H<sub>5</sub>CN). *73rd International Symposium on Molecular Spectroscopy*, 2018
- [5] **Shingledecker, C. N.**, Tennis, J. D., Le Gal, R. A., & Herbst, E., Cosmic Ray-Driven Radiation Chemistry in Cold Interstellar Environments. *73rd International Symposium on Molecular Spectroscopy*, 2018
- [4] Burkhardt, A. M., **Shingledecker, C. N.**, Herbst, E., Kalenskii, S., McCarthy, M. C., Remijan, A. J., & McGuire, B. A., New Carbon-Chain Molecular Detections in TMC-1 with the Green Bank Telescope. *73rd International Symposium on Molecular Spectroscopy*, 2018



- [3] **Shingledecker, C. N.** & Herbst, E., A New Model of the Chemistry of Ionizing Radiation in Solids. *72nd International Symposium on Molecular Spectroscopy*, 2017
- [2] Burkhardt, A. M., **Shingledecker, C. N.**, Le Gal, R. A., McGuire, B. A., Remijan, A. J., & Herbst, E., Time-Sensitive Chemical Tracers Within Shocked Astrophysical Sources. *72nd International Symposium on Molecular Spectroscopy*, 2017
- [1] Burkhardt, A. M., Dollhopf, N. M., Corby, J. F., Carroll, P. B., **Shingledecker, C. N.**, Loomis, R. A., Booth, S. T., Blake, G. A., Remijan, A. J., & McGuire, B. A., Carma Observations of L1157: Chemical Complexity in the Shocked Outflow. *71st International Symposium on Molecular Spectroscopy*, 2016

#### White Papers

- [1] McGuire, B. A., Bergin, E., Blake, G. A., Burkhardt, A. M., Cleeves, L. I., Loomis, R. A., Remijan, A. J., **Shingledecker, C. N.**, & Willis, E. R., Observing the Effects of Chemistry on Exoplanets and Planet Formation. *Science with an ngVLA*, 2018

#### Other Publications

- [2] McGuire, B. A., **Shingledecker, C. N.**, Willis, E. R., Burkhardt, A. M., El-Abd, S., Motiyenko, R. A., Brogan, C. L., Hunter, T. R., Margules, L., Guillemin, J. C., Garrod, R. T., Herbst, E., & Remijan, A. J., VizieR Online Data Catalog: CH<sub>3</sub>OCH<sub>2</sub>OH ALMA detection in NGC 6334I, 2018
- [1] **Shingledecker, C. N.**, Thermally Induced Chemistry of Meteoritic Complex Organic Molecules: A New Heat-Diffusion Model for the Atmospheric Entry of Meteorites. *Arxiv e-Prints*, 2014

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### Selected Invited Talks, Colloquia, and Seminars

- Nov. 2023 **New Theoretical Methods for Simulating Cosmic Ice**, *Invited Talk*, Workshop on Interstellar Matter 2023, Institute for Low-Temperature Science, University of Hokkaido  
Sapporo, Japan
- Nov. 2022 **Cosmic Ray Bombardment of Cosmic Ice**, *Invited Talk*, Cosmic Rays 2, Arcetri Observatory  
Florence, Italy
- Apr. 2022 **On the Origin of Life: A Scientific Perspective**, *Invited Talk*, The Origin of Life and Nature Before Sin: Scientific and Theological Perspectives, Pontifical University of St. Thomas Aquinas (Angelicum)  
Rome, Italy

- Apr. 2021 **Modeling cosmic ices in the JWST era**, *Mid-America Regional Astrophysics Conference (MARAC)*, Invited Keynote Address  
Virtual
- Mar. 2021 **New methods for simulating astrophysical ices in the JWST era**, *Invited Talk*, American Physical Society Marth Meeting, Mar. 15th – 19th 2021  
Virtual
- Jan. 2021 **Modeling cosmic-ray-driven grain chemistry in the JWST-Era**, *Invited Conference Talk*, 43<sup>rd</sup> COSPAR Scientific Assembly, International Convention Centre  
Virtual
- May 2020 **Cosmic Rays and Grain Chemistry in Star- and Planet-forming Regions**, *Invited Talk*, Astrochemistry Discussions Series  
Virtual
- May 2020 **Cosmic Rays in Astrochemical Models**, *Invited Talk*, Astrochemistry Webinar Series, American Vacuum Society, UCF Chapter Seminar Series  
Virtual
- Oct. 2019 **A Tour of the Molecular Universe**, *Special Joint Physics/Chemistry Seminar*, Old Dominion University, Host: Peter Bernath  
Norfolk, VA
- Oct. 2019 **Modeling Dust-grain Ice Mantles in the JWST Era**, *NRAO/UVa Colloquium*, Host: Scott Ransom, National Radio Astronomy Observatory  
Charlottesville, VA
- Sep. 2019 **New Frontiers in Astrochemical Modeling**, *Institute Colloquium*, Host: Victor Rivilla, INAF-Osservatorio Astrofisico di Arcetri  
Florence, Italy
- Mar. 2019 **Astrochemistry: A story of how molecules are made and destroyed in space**, *Institute Colloquium*, Host: Johannes Kästner, Institute for Theoretical Chemistry: University of Stuttgart  
Stuttgart, Germany
- Nov. 2018 **Simulating Cosmic Ray-Driven Processes in Astrochemical Models: How and Why**, *SFB 956 Colloquium*, Universität zu Köln: Physikalische Institute, Host: Stephan Schlemmer  
Cologne, Germany
- Oct. 2018 **Radiation chemistry: a vital element for the accurate chemical modeling of star and planet-forming regions**, *MPE-ESO Star and Planet Formation Seminar*, ESO, Host: Anna Miotello  
Munich, Germany
- Oct. 2018 **The Role of Cosmic Ray-Driven Processes in Interstellar Ices**, *CAS Seminar*, Max Planck Institute for Extraterrestrial Physics, Host: Paola Caselli  
Munich, Germany

- Sep. 2018 **The importance of radiation chemistry in star and planet-forming regions**, *MPE-ESO Journal Club*, Max Planck Institute for Extraterrestrial Physics, Host: Felipe Alves  
Munich, Germany
- June 2017 **Cosmic Rays Bite the Dust: An Introduction to the CIRIS Model**, *Invited talk*, Wellesley College, Host: Christopher Arumainayagam  
Wellesley, MA, USA
- May 2017 **Modeling Cosmic Ray Induced Interstellar Chemistry**, *Tuesday UVa/NRAO Astronomy (TUNA) Lunch Talk Series*, NRAO, Host: Kristina Nyland  
Charlottesville, VA, USA

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### Selected Other Conference Talks and Posters

- Jun. 2020 **Understanding Isomers in Interstellar Environments**, *Talk*, Astrochemical Frontiers: Quarantine Edition  
Virtual
- Mar. 2020 **Simulating Grain Chemistry in Star- and Planet-Forming Regions**, *Talk*, Virginia Initiative for Cosmic Origins (VICO) Science Day, University of Virginia  
Charlottesville, VA, USA
- Jun. 2019 **Simulating Ion-Irradiation Experiments Using Astrochemical Models**, *Talk*, From Nanometers to Megaparsecs: A Symposium in Honor of John Black, Chalmers University  
Gothenburg, Sweden
- Apr. 2019 **Radiation Chemistry in Astrochemical Models: From the Lab to the ISM**, *Poster*, IAU Symposium on Laboratory Astrophysics, Jesus College, University of Cambridge  
Cambridge, UK
- Dec. 2018 **Radiation Chemistry: The Latest Refuge of the Scoundrel?**, *Talk*, CAS Retreat, Schloss Ringberg  
Kreuth, Germany
- Sep. 2018 **Solid-Phase Cosmic Ray-Driven Radiation Chemistry in Astrochemical Models**, *Poster*, COST Action CM1401: Our Astro-Chemical History, Hof van Saksen  
Nooitgedacht, Netherlands
- Jun. 2018 **Cosmic Ray-Driven Radiation Chemistry in Cold Interstellar Environments**, *Talk*, International Symposium on Molecular Spectroscopy, University of Illinois - Urbana-Champaign  
Urbana-Champaign, IL, USA
- May 2018 **Cosmic ray-driven radiation chemistry in astrochemical models**, *Poster*, Cosmic Rays: The Salt of the Star Formation, Osservatorio Astrofisico di Arcetri  
Florence, Italy

- Jun. 2017 **A New Model of the Chemistry of Ionizing Radiation in Solids**, *Talk*, International Symposium on Molecular Spectroscopy, University of Illinois - Urbana-Champaign  
Urbana-Champaign, IL, USA
- Jun. 2017 **Cosmic Irradiation of Interstellar Ices as a Means of Forming Prebiotic Molecules**, *Talk*, Astrobiology Graduate Conference, University of Virginia  
Charlottesville, VA, USA
- Jun. 2017 **PWR Winner Presentation: European Ice Irradiation as a Mechanism of Prebiotic Molecule Synthesis**, *Talk*, Astrobiology Graduate Conference, University of Virginia  
Charlottesville, VA, USA
- Apr. 2017 **Simulating the chemistry of ionizing radiation in solids**, *Poster*, American Chemical Society 253<sup>rd</sup> National Meeting, Moscone Center  
San Francisco, CA, USA
- Feb. 2015 **Cosmic-ray Induced Interstellar Grain Chemistry: A New Microscopic Monte Carlo Approach**, *Poster*, Second Workshop on Experimental Laboratory Astrophysics, Poipu Beach  
Kauai, HI, USA
- Jul. 2014 **Temperature Gradients in Meteorites During Atmospheric Entry**, *Poster*, Astrobiology Graduate Conference, Rensselaer Polytechnic Institute  
Troy, NY, USA
- Apr. 2013 **Analysis of the Chemistry of Protoplanetary Disks: The Search for the Water Snow-line**, *Talk*, Distinguished Majors Symposium, University of Virginia  
Charlottesville, VA, USA

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## Languages

English	Fluent	<i>Native speaker</i>
German	Intermediate	<i>Reading and speaking</i>
French	Basic	<i>Reading and some speaking</i>

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## References

- Ref. 1 **Dr. Eric Herbst**, *Commonwealth Professor*, Departments of Chemistry, Astronomy, & Physics, University of Virginia, Charlottesville, VA 22904  
tel: +1 434-243-0535 email: eh2ef@virginia.edu
- Ref. 2 **Dr. Christopher R. Arumainayagam**, *Nancy Harrison Kolodny '64 Professor*, Department of Chemistry, Wellesley College, Wellesley, MA 02481  
tel: +1 781-283-3326 email: carumain@wellesley.edu
- Ref. 3 **Dr. Brett McGuire**, *Class of 1943 Career Development Assistant Professor*, Department of Chemistry, MIT, Cambridge, MA 77 02139  
tel: +1 617-253-2457 email: brettmc@mit.edu