Curriculum Vitae

Marc Kornbleuth

Boston University, Department of Astronomy
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Education

Ph.D. Astronomy August 2020
Department of Astronomy, Boston University
Dissertation: Using Hydrogen Energetic Neutral Atoms to Study the Heliosphere
Advisor: Prof. Merav Opher

M.A. Astronomy September 2016
Department of Astronomy, Boston University

B.A. Astronomy & Physics with Honors Spring 2013
Department of Astronomy, Boston University
Dissertation: The Effect of Heating and Acceleration of Winds for Calculating Mass Loss Rates of Stars
Advisor: Prof. Merav Opher

Research Appointments

Research Scientist
Department of Astronomy, Boston University October 2022-present

Director of Global Heliosphere (Research Thrust #1) Team, SHIELD Drive Center
September 2025-present
Department of Astronomy, Boston University, PI: Dr. Merav Opher

Deputy Director of Global Heliosphere (Research Thrust #1) Team, SHIELD Drive Center April 2022-August 2025
Department of Astronomy, Boston University, PI: Dr. Merav Opher

Postdoctoral Associate August 2020-September 2022
Department of Astronomy, Boston University, Advisor: Dr. Merav Opher

Graduate Researcher September 2014 – August 2020

Department of Astronomy, Boston University, Advisor: Dr. Merav Opher

Research Assistant September 2013 – August 2014
Harvard-Smithsonian Center for Astrophysics, Advisor: Dr. Bradford Wargelin

Undergraduate Student Researcher September 2011 - May 2013
Boston University, Advisor: Dr. Merav Opher

Research Awards, Honors, & Teams

ISSI Science Team #24-613 (Lead) 2024-present
NASA DRIVE Center Grant (Co-I) 2022-present
Heliophysics Guest Investigator Grant (Scientific PI) 2022-present
Heliophysics Supporting Research Grant (Co-I) 2021-2022
ISSI Science Team #541 (Early Career Scientist) 2021-2024
NASA Earth and Space Science Fellowship May 2018
NSF Graduate Research Fellowship - Honorable Mention March 2016
Second Prize in Ionosphere/Magnetosphere category of the Community Coordinated Modeling Center Student Research Contest - NSF, CCMC May 2014
Student Research Award - Boston University Summer 2012

Teaching Appointments

Teaching Fellow PY 105
Elementary Physics I
Department of Physics, Boston University Summer 2018

REU Seminar Coordinator
Department of Astronomy, Boston University Summer 2017

Teaching Fellow AS 109
Cosmology
Department of Astronomy, Boston University Spring 2015

Teaching Fellow AS 102
The Astronomical Universe
Department of Astronomy, Boston University Fall 2014

Mentored Students

Sammy Siegel 2024-present
Ethan Bair 2022-present
Chika Onubogu 2021-present
Xiaohan Ma 2020-present

Erick Powell	2020-present
Warren Shelley	2020
Mark Hubbert	2017
Matthew Schueler	2017
Christopher Bambic	2016

Public Outreach, Service, and Teams

AGU26 Fall Meeting Session Primary Convener (SH21C/SH23A)	2026
COSPAR 2026 SOC (D1.2)	2026
Lead of SWIM (Solar Wind-Interstellar Medium) Workshop LOC	2025
AGU25 Fall Meeting Session Primary Convener (SH13A/21D)	2025
NASA HQ Panelist – ROSES HSR 2024	2024
AGU24 Fall Meeting Session Primary Convener (SH21D/34B)	2024
AGU23 Fall Meeting Session Primary Convener (SH43D/53A)	2023
OH-VLISM Online Seminar Primary coordinator	2023-
2023 SHINE Workshop Session Co-Convener	2023
SHIELD Summer School Lecturer (‘Basics of the Heliosphere’)	2023
AGU22 Fall Meeting Session Co-Convener (SH45G)	2022
NASA NPP Reviewer	2022, 2024
Senior Review - Voyager	2022
OH-VLISM Online Seminar Co-coordinator	2021-2023
30th Anniversary of the Center for Space Physics	2018
Boston University Astronomy Department Twitter Account	2016 – 2020
Boston University Public Open Nights	2016 – 2019
Boston University Natural Sciences Curriculum Committee	Fall 2016

Professional Memberships

American Geophysical Union (AGU)

Refereed Publications

1. **Kornbleuth, M.** & Opher, M. (2026), *Prediction for IMAP: Revealing the Role of the Solar Magnetic Field in the Heliotail*, ArXiv, 2606:26250, doi:10.48550/arXiv.2606.26250

2. **Kornbleuth, M.**, Opher, M., Drake, J. F., Swisdak, M., Yin, Z., Dialynas, K., Chen, Y., Giacalone, J., Sokol, J. M., Gkioulidou, M., Baliukin, I., Izmodenov, V., Zank, G. P. (2026), *First Evidence of a Split-tail Heliosphere from Reconnection and in High-Energy Energetic Neutral Atoms*, ApJ, 1004, 1, doi:10.3847/1538-4357/ae67fc

3. Nakanotani, M., Zank, G. P., **Kornbleuth, M.**, Opher, M. (2026), *Power-law PUI Energy Spectrum at an Oblique Heliospheric Termination Shock*, Astrophysical Journal Letters, 1001, L16, doi:10.3847/2041-8213/ae5706

4. Sokol, J. M., Gasser, J., Opher, M., **Kornbleuth, M.**, et al. (2025), *Evolution of Large-Scale Structures in the Energetic Neutral Atom Sky Maps in Energy and Solar Activity*, Astrophysical Journal, 992, 168, doi:10.3847/1538-4357/adfa24

5. Ma, X., Opher, M., **Kornbleuth, M.** (2025), *The Coupling and Evolution of Kelvin-Helmholtz and Rayleigh-Taylor Instabilities in the Heliosheath*, Astrophysical Journal, 988, 248, doi:10.3847/1538-4357/ade881

6. Bair, E., Opher, M., **Kornbleuth, M.**, Zieger, B., Toth, G., van der Holst, B. (2025), *Consequences of Hot Electrons for the Structure of the Outer Heliosphere*, Astrophysical Journal, 988, 223, doi:10.3847/1538-4357/ade437

7. Fuselier, S., Zirnstein, E. J., Heerikhuisen, J., Galli, A., Richardson, J. D., Reisenfeld, D. B., Schwadron, N. A., Dayeh, M. A., McComas, D. J., Funsten, H. O., Sokol, J. M., Opher, M., **Kornbleuth, M.**, Gasser, J. (2025), *Energetic Neutral Atom Fluxes from the Voyager 1 and 2 Directions*, Astrophysical Journal, 987, 15, doi:10.3847/1538-4357/addd12

8. Opher, M., **Kornbleuth, M.**, Decker, R., Richardson, J. D., Bair, E., Dialynas, K., Nikoukar, R., Hill, M., Du, S., Florinski, V. (2025), *Large-scale Field-aligned Flows in the Heliosheath*, Astrophysical Journal, 985, 85, doi:10.3847/1538-4357/adced5

9. Du, S., Opher, M., **Kornbleuth, M.** (2025), *On the Anisotropic Velocity Distribution of Newborn Pickup Ions in the Heliosheath*, Astrophysical Journal Letters, 982, L59, doi:10.3847/2041-8213/adbc9a

10. Onubogu, C., Opher, M., **Kornbleuth, M.**, Toth, G., Florinski, V. (2025), *Treatment of the Split ("Croissant-like") Heliotail by a Level Set Method*, Astrophysical Journal Letters, 980, L19, doi:10.3847/2041-8213/ada68e

11. Giacalone, J., **Kornbleuth, M.**, Opher, M., Gkioulidou, M., Kota, J., Puzzoni, E., Richardson, J. D., Zank, G. P. (2025), *Hybrid Simulations of Interstellar Pickup Ions at the Solar Wind Termination Shock Revisited*, Astrophysical Journal, 980, 29, doi:10.3847/1538-4357/ada89c

12. Ma, X., Opher, M., **Kornbleuth, M.**, & Toth, G. (2025), *Instabilities Along the Axis of the Heliospheric Jets*, Astrophysical Journal, 978, 57, doi:10.3847/1538-4357/ad93a5

13. Slavin, J., **Kornbleuth, M.**, Opher, M., Toth, G. (2025), *Interstellar Dust Transport Through the Heliosphere Including the Sector Region*, Astrophysical Journal, Submitted.

14. **Kornbleuth, M.,** Opher, M., Dayeh, M. A., Sokol, J. M., Turner, D. L., Baliukin, I. B., Dialynas, K., Izmodenov, V. (2024), *Inferring the Interstellar Magnetic Field Direction from Energetic Neutral Atom Observations of the Heliotail*, Astrophysical Journal Letters, 967, L12, doi:10.3847/2041-8213/ad4498

15. Chen, Y., Toth, G., Powell, E., Arshad, T., Bair, E., **Kornbleuth, M.**, & Opher, M. (2024), *A Kinetic-Magnetohydrodynamic Model with Adaptive Mesh Refinement for Modeling Heliosphere Neutral-Plasma Interaction*, Astrophysical Journal, 973, 46, doi:10.3847/1538-4357/ad6323

16. Opher, M., Loeb, A., Zucker, C., Goodman, A., Konietzka, R., Worden, A. Z., Economo, E. P., Miller, J., Alves, J., Grone, J., **Kornbleuth, M.**, et al. (2024), *The Passage of Solar System Through the Edge of the Local Bubble*, Astrophysical Journal, ApJ, 972, 201, doi:10.3847/1538-4357/ad596e

17. Swaczyna, P., Bzowski, M., Dialynas, K., Dyke, L., Fraternale, F., Galli, A., Heerikhuisen, J., **Kornbleuth, M.**, et al. (2024), *Interstellar Neutral Hydrogen in the Heliosphere: New Horizons Observations in the Context of Models*, Astrophysical Journal Letters, 969, L20, doi:10.3847/2041-8213/ad5832

18. Turner, D. L., Michael, A. T., Provornikova, E., **Kornbleuth, M.**, Opher, M., et al. (2024), *Evidence of a Thick Heliopause Boundary Layer Resulting from Active Magnetic Reconnection with the Interstellar Medium*, Astrophysical Journal, 960, 130, doi:10.3847/1538-4357/ad05d3

19. Powell, E., Opher, M., **Kornbleuth, M.**, Baliukin, I., Michael, A. T., Wood, B. E., Izmodenov, V., Toth, G., Tenishev, V. (2024), *Lyman-alpha Absorption in a "Croissant-like" Heliosphere*, Astrophysical Journal, 961, 235

20. Spitzer, S. A., **Kornbleuth, M.**, Opher, M., Gilbert, J. A., Raines, J. M., Lepri, S. T. (2024), *Complementary Interstellar Detections from the Heliotail*, Frontiers in Astronomy and Space Sciences, 10, 1163519, doi: 10.3389/fspas.2023.1163519

21. Galli, A., Baliukin, I., **Kornbleuth, M.**, Opher, M., Fuselier, S. A., Sokol, J. M., Dialynas, K., Dayeh, M. A., Izmodenov, V. V., Richardson, J. D. (2023), *The Discrepancy between Observed and Predicted Heliospheric Energetic Neutral Atoms below Solar Wind Energy*, Astrophysical Journal Letters, 954, L24, doi:10.3847/2041-8213/aced9b

22. Opher, M., Richardson, J., Zank, G., Florinski, V., Giacalone, J., Solol, J. M., Toth, G., Buxner, S., **Kornbleuth, M.**, et al. (2023), *Solar Wind with Hydrogen Ion charge Exchange and Large-Scale Dynamics (SHIELD) DRIVE Science Center*, Frontiers in Astronomy and Space Sciences, 10, 1143909, doi:10.3389/fspas.2023.1143909

23. **Kornbleuth, M.**, Opher, M., Dialynas, K., Zank, G. P., Wang, B. B., Baliukin, I., Gkioulidou, M., Giacalone, J., Izmodenov, V., Sokol, J. M., Dayeh, M. A. (2023), *Probing the Length of the Heliospheric Tail with ENAs from 0.52-80 keV*, Astrophysical Journal Letters, 945, L15, doi: 10.3847/2041-8213/acbc73

24. **Kornbleuth, M.**, Opher, M., Zank, G. P., Wang, B. B., Giacalone, J., Gkioulidou, M., Dialynas, K. (2023), *An Anomalous Cosmic Ray Mediated Termination Shock: Implications for Energetic Neutral Atoms*, Astrophysical Journal Letters, 944, L47, doi:10.3847/2041-8213/acb9e0

25. Dialynas, K., Sterken, V. J., Brandt, P. C., Burlaga, L., Berdichevsky, D. B., Decker, R. B., Della Torre, S., DeMajistre, R., Galli, A., Gkioulidou, M., Hill, M. E., Krimigis, S. M., **Kornbleuth, M.**, Kurth, W., Lavraud, B., et al. (2023), *A Future Interstellar Probe on the Dynamic Heliosphere and its Interaction with the Very Local Interstellar Medium: In-situ Particle and Fields Measurements and Remotely Sensed ENAs*, Frontiers in Astronomy and Space Sciences, 10, 1061969

26. Lavraud, B., Opher, M., Dialynas, K., Turner, D. L., Eriksson, S., Provornikova, E., **Kornbleuth, M.**, Mostafavi, P., Fedorov, A., Richardson, J. D., Fuselier, S. A., Drake, J., Swisdak, M., Eubanks, M., Chen, T. Y., Kucharek, H., et al. (2023), *What is the Heliopause? Importance of Magnetic Reconnection and Measurement Requirements*, Frontiers in Astronomy and Space Sciences, 10, 1060618

27. Wang, B. B., Zank, G. P., Shrestha, B. L., **Kornbleuth, M.**, Opher, M. (2023), *Relating Energetic Ion Spectra to Energetic Neutral Atoms (ENAs)*, Astrophysical Journal, 944, 198, doi:10.3847/1538-4357/acb437

28. Galli, A., Baliukin, I., Bzowski, M., Izmodenov, V., **Kornbleuth, M.**, Kucharek, H., Mobius, E., Opher, M., Reisenfeld, D., Schwadron, N. A., Swaczyna, P. (2022), *The Heliosphere and Local Interstellar Medium from Neutral Atom Observations at Energies below 10 keV*, Space Science Reviews, 218, 31, doi:10.1007/s11214-022-00901-7

29. Kleimann, J. Dialynas, K., Fraternale, F., Galli, A., Heerikhuisen, J., Izmodenov, V., **Kornbleuth, M.**, Opher, M. Pogorelov, N. (2022), *The Structure of the Large-Scale Heliosphere as Seen by Current Models*, Space Science Reviews, Space Science Reviews, 218, 36, doi:10.1007/s11214-022-00902-6

30. Sokol, J. M., Kucharek, H., Baliukin, I., Izmodenov, V. V., **Kornbleuth, M.**, Mostafavi, P., Opher, M., Park, J., Pogorelov, N., Quinn, P., Smith, C. W., Zank, G., Zhang, M. (2022), *Interstellar Neutrals, Pickup Ions, and Energetic Neutral Atoms Throughout the Heliosphere: Present Theory and Modeling Overview*, Space Science Reviews, 218, 18, doi:10.1007/s11214-022-00883-6

31. Gkioulidou, M., Opher, M., **Kornbleuth, M.**, Dialynas, K., Giacalone, J., Richardson, J. D., Zank, G. P., Fuselier, S. A., Mitchell, D. G., Krimigis, S. M., Roussos, E., Baliukin, I. (2022), *First Comparison of Composite 0.52-55 keV ENA Spectra Observed by IBEX and Cassini/INCA with Simulated ENAs Inferred by Proton Hybrid Simulations Downstream of the Termination Shock*, Astrophysical Journal Letters, Accepted

32. **Kornbleuth, M.,** Opher, M., Baliukin, I., Gkioulidou, M., Richardson, J. D., Zank, G. P., Michael, A. T., Toth, G., Tenishev, V., Izmodenov, V., Alexashov, D., Fuselier, S., Drake, J. F., Dialynas, K. (2021), *The Development of a Split-Tail Heliosphere and the Role of Non-ideal Processes: A Comparison of the BU and Moscow Models*, Astrophysical Journal, 923, 179, doi: 10.3847/1538-4357/ac2fa6

33. **Kornbleuth, M.,** Opher, M., Baliukin, I., Dayeh, M. A., Zirnstein, E. J., Gkioulidou, Dialynas, K., Galli, A., Richardson, J. D., Izmodenov, V., Zank, G. P, Fuselier, S. P.(2021), *Signature of a Heliotail Organized by the Solar Magnetic Field and the Role of Non-ideal Processes in Modeled IBEX ENA Maps: A Comparison of the BU and Moscow MHD Models*, Astrophysical Journal, 921, 164, doi: 10.3847/1538-4357/ac1e2a

34. Opher, M., Drake, J. F., Zank, G., Powell, E., Shelley, W., **Kornbleuth, M.**, Florinski, V., Izmodenov, V., Giacalone, J., Fuselier, S., Dialynas, K., Loeb, A., Richardson, J. (2021), *A Turbulent Heliosheath Driven by the Rayleigh-Taylor Instability*, Astrophysical Journal, 922, 181, doi: 10.3846/1538-4357/ac2d2e

35. Fuselier, S. A, Galli, A., Richardson, J. D., Reisenfeld, D. B., Zirnstein, E. J., Heerikhuisen, J., Dayeh, M. A., Schwadron, N. A., McComas, D. J., Elliot, H. A., Gomez, R. G., Starkey, M. J., **Kornbleuth, M. Z.**, Opher, M., Dialynas, K. (2021) *Energetic Neutral Atom Fluxes from the Heliosheath: Constraints from in situ Measurements and Models*, Astrophysical Journal Letters, 915, L26, doi: 10.3847/2041-8213/ac0d5c

36. **Kornbleuth, M.**, M. Opher, A. T. Michael, J. M. Sokół, G. Toth, V. Tenishev, and J. F. Drake (2020), *The Confinement of the Heliosheath Plasma by the Solar Magnetic Field as Revealed by Energetic Neutral Atoms*, Astrophysical Journal Letters, 895, L26, 10.3847/2041-8213/ab922b.

37. **Kornbleuth, M.**, M. Opher, A. T. Michael, and J. F. Drake (2018), *Globally Distributed Energetic Neutral Atoms for the 'Croissant' Heliosphere*, Astrophysical Journal, 865, 84, doi:10.3847/1538-4357/aadbac.

38. Kay, C., M. Opher, and **M. Kornbleuth** (2016), *Probability of CME Impact on Exoplanets Orbiting M Dwarfs and Solar-like Stars*, Astrophysical Journal, 826, 195, doi:10.3847/0004-637X/826/2/195.

39. Wargelin, B.J., **M. Kornbleuth**, P. L. Martin, and M. Juda (2014), *Observation and Modeling of Geocoronal Charge Exchange X-Ray Emission during Solar Wind Gusts*, Astrophysical Journal, 796,28, doi:10.1088/0004-637X/796/1/28.

Non-Refereed Publications

1. **Kornbleuth, M.**, Chen, T. Y., Drake, J. F., et al. (2023), *The Importance of Understanding the Solar Magnetic Field in the Heliosphere using the Interstellar Probe*, Decadal Survey for Solar and Space Physics (Heliosphysics) 2024-2033 white paper, Bulletin of the American Astronomical Society, 55, 222, doi: 10.3847/25c2cfeb.cdeb90fd

2. Sokol, J., Dayeh, M. A., Dialynas, K., …, **Kornbleuth, M.**, et al. (2023), *Measurements Beyond 1 au are Necessary for Exploration of the Outer Heliosphere and Local Interstellar Medium*, Decadal Survey for Solar and Space Physics (Heliosphysics) 2024-2033 white paper, Bulletin of the American Astronomical Society, 55, 373, doi: 10.3847/25c2cfeb.5b6c799b

3. Mayyasi, M., Clarke, J., Quemerais, E., …, **Kornbleuth, M.**, et al. (2023), *Measuring Neutral Hydrogen Properties in the Interplanetary Medium*, Decadal Survey for Solar and Space Physics (Heliosphysics) 2024-2033 white paper, Bulletin of the American Astronomical Society, 55, 275, doi: 10.3847/25c2cfeb.86565aec

4. Lavraud, B., **Kornbleuth, M.**, Wimmer-Schweingruber, R. F., et al. (2023), *What is the Heliopause? Importance of magnetic reconnection and measurement requirements*, Decadal Survey for Solar and Space Physics (Heliosphysics) 2024-2033 white paper, Bulletin of the American Astronomical Society, 55, 230, doi: 10.3847/25c2cfeb.771c2729

5. Dialynas, K., Brandt, P. C., Burlaga, L., …, **Kornbleuth, M.**, et al. (2023), *A future Interstellar Probe on the dynamic heliosphere and its interaction with the very local interstellar medium*, Decadal Survey for Solar and Space Physics (Heliosphysics) 2024-2033 white paper, Bulletin of the American Astronomical Society, 55, 096, doi: 10.3847/25c2cfeb.e3624787

6. DeMajistre, R., Mitchell, D., McNutt, R., …, **Kornbleuth, M.**, et al. (2023), *Seeing the Shape, Dynamics, and Global Structure of the Heliosphere*, Decadal Survey for Solar and Space Physics (Heliosphysics) 2024-2033 white paper, Bulletin of the American Astronomical Society, 55, 091, doi: 10.3847/25c2cfeb.f85303df

7. Brandt, P., Alterman, B., Alvarez, E., …, **Kornbleuth, M.**, et al. (2023), *Pushing the Frontier of Solar & Space Physics: Exploration of the Heliosphere and the Very Local Interstellar Medium by an Interstellar Probe*, Decadal Survey for Solar and Space Physics (Heliosphysics) 2024-2033 white paper, Bulletin of the American Astronomical Society, 55, 038, doi: 10.3847/25c2cfeb.e0bf48d5

8. Opher, M., Richardson, J., Giacalone, J., **Kornbleuth, M.**, et al. (2023), *Our Heliospheric Shield, a Case of a Habitable Astrosphere: Need to Revisit this region with In-Situ Measurements with Modern Instrumentation*, Decadal Survey for Solar and Space Physics (Heliosphysics) 2024-2033 white paper, 304

Conference Abstracts

1. Magnetic Reconnection in the Heliotail and the Effect on Energetic Neutral Atoms, **Kornbleuth, M.**, Opher, M. Drake, J., et al. COSPAR 2026, August 2026, Oral Presentation, D1.2-0008-26

2. An Ultra-low Energy "Neck" Feature in the Galactic Cosmic Ray Spectrum Observed in the Very Local Interstellar Medium, Hill, M., Nikoukar, R., Berland, G.,…, **Kornbleuth, M.**, et al. COSPAR 2026, August 2026, Oral Presenation, PIR.1-0013-26

3. Magnetic Reconnection in the Heliotail as a Source for the INCA Belt, **Kornbleuth, M.**, Opher, M., Drake, J., et al., AGU Fall Meeting Abstracts, Fall 2025, Poster Presentation, SH21E-2543

4. The Coupling and Evolution of Kelvin-Helmholtz and Rayleigh-Taylor Instabilities in the Heliosheath, Ma, X., Opher, M., **Kornbleuth, M.**, AGU Fall Meeting Abstracts, Fall 2025, Oral Presentation, SH13A-08

5. A New Low-energy Cosmic Ray Population in the Very Local Interstellar Medium, Hill, M., Nikoukar, R., Berland, G.,…, **Kornbleuth, M.**, Krimigis, S., et al., AGU Fall Meeting Abstracts, Fall 2025, Oral Presentation, SH13A-05

6. Large-scale Sky Structures of Heliospheric ENAs Before IMAP, Sokol, J., Gasser, J., Opher, M., **Kornbleuth, M.**, et al., AGU Fall Meeting Abstracts, Fall 2025, Oral Presentation, SH21E-2541

7. The Main Unresolved Questions on Energetic Neutral Atoms from the Heliosphere Observed at Low Energies with IBEX-Lo, Galli, A., Wurz, P., Schwadron, N., …, **Kornbleuth, M.**, et al., AGU Fall Meeting Abstracts, Fall 2025, Poster Presentation, SH21E-2554

8. Voyager Informed Modeling of Pickup Ions and Energetic Neutral Atoms, Du, S., Opher, M., **Kornbleuth, M.**, Bair, E., Giacalone, J., AGU Fall Meeting Abstracts, Fall 2025, Poster Presentation, SH21D-2531

9. Consequences from Inclusion of Divergence-free Magnetic Field Dissipation in the Heliosheath, Powell, E., Opher, M., Drake, J., van der Holst, B., **Kornbleuth, M.**, AGU Fall Meeting Abstracts, Fall 2025, Poster Presentation, SH21D-2533

10. The Heliosheath with a Non-Maxwellian, Isotropic Pickup-ion Distribution, Bair, E., Opher, M., van der Holst, B., **Kornbleuth, M.**, Zank, G. P., AGU Fall Meeting Abstracts, Fall 2025, Poster Presentation, SH21D-2529

11. A Global Model of the Entry and Propagation of Galactic Cosmic Rays in a Split-tail Heliosphere, Siegel, S., Opher, M., Guzman, J., Florinski, V., van der Holst, B., **Kornbleuth, M.**, AGU Fall Meeting Abstracts, Fall 2025, Poster Presentation, SH21D-2535

12. Magnetic Reconnection in the Heliotail and the Effect on Energetic Neutral Atoms, **Kornbleuth, M.**, Opher, M., Drake, J., et al., Solar Wind Interstellar Medium (SWIM) Workshop, August 2025, Oral Presentation

13. Lyman Alphia Absorption in a "Croissant-like" Heliosphere, Powell, E., Opher, M., Kornbleuth, M., Baliukin, I., et al., Solar Wind Interstellar Medium (SWIM) Workshop, August 2025, Poster Presentation

14. A Global Model of a Split-tail Heliosphere for Studying the Entry and Propagation of Galactic Cosmic Rays, Siegel, S., Opher, M., Florinski, V., Guzman, J., van der Holst, B., **Kornbleuth, M.**, Solar Wind Interstellar Medium (SWIM) Workshop, August 2025, Oral Presentation

15. A New Low-energy Cosmic Ray Population in the Very Local Interstellar Medium, Hill, M., Nikoukar, R., Berland, G.,…, **Kornbleuth, M.**, Krimigis, S., et al., Solar Wind Interstellar Medium (SWIM) Workshop, August 2025, Oral Presentation

16. Dynamics of the Upwind Heliosphere Due to Solar-cycle Variations of the Solar Wind and Magnetic Field, Onubogu, C., Opher, M., Powell, E, Du, S., **Kornbleuth, M.**, Sokol, J., van der Holst, B., Solar Wind Interstellar Medium (SWIM) Workshop, August 2025, Oral Presentation

17. Magnetic Reconnection and the Energization of Particles in the Outer Heliosphere, Swisdak, M., Drake, J., Yin, Z., **Kornbleuth, M.**, Opher, M., Solar Wind Interstellar Medium (SWIM) Workshop, August 2025, Oral Presentation

18. Ion Distribution and ENA Fluxes in Voyager 2 Direction, Du, S., Opher, M., **Kornbleuth, M.**, Bair, E., Giacalone, J., Solar Wind Interstellar Medium (SWIM) Workshop, August 2025, Oral Presentation

19. Consequences of Hot Electrons for the Structure of the Heliosphere, Bair, E., Opher, M., **Kornbleuth, M.**, Zieger, B., Toth, G., van der Holst, B., Solar Wind Interstellar Medium (SWIM) Workshop, August 2025, Oral Presentation

20. Magnetic Reconnection in the Heliotail and the Effect on Energetic Neutral Atoms, **Kornbleuth, M.**, Opher, M., Drake, J., et al., 22nd Annual International Astrophysics Conference, April 2025, Oral Presentation (Solicited)

21. Energetic Neutral Atom Fluxes from the Voyager 1 and 2 Directions, Fuselier, S., Zirnstein, E., Heerikhuisen, J.,…,**Kornbleuth, M.**, 22nd Annual International Astrophysics Conference, April 2025, Oral Presentation

22. *Multi-ion Modeling of Inner and Outer Heliosheath-created PUIs: Implications on the Heliosphere and ENAs*, **Kornbleuth, M.**, Opher, M., Sokol, J. M., Bair, E., Chen, Y., Dialynas, K., et al., AGU Fall Meeting Abstracts, Fall 2024, Oral Presentation, SH33F-09

23. *Effects of Solar-Cycle Varying Plasma Flow and Magnetic Intensity in the Split ("Croissant-like") Heliosphere*, Onubogu, C., Opher, M., **Kornbleuth, M.**, Sokol, J. M., van der Holst, B., AGU Fall Meeting Abstracts, Fall 2024, Poster Presentation, SH21D-2842

24. *Impact of Hot Electrons on the Heliosheath Plasma*, Bair, E., Opher, M., **Kornbleuth, M.**, Zieger, B., Toth, G., van der Holst, B., AGU Fall Meeting Abstracts, Fall 2024, Poster Presentation, SH21D-2846

25. *Long term evolution of instabilities in the heliotail*, Ma, X., Opher, M., **Kornbleuth, M.**, Florinski, V., AGU Fall Meeting Abstracts, Fall 2024, Poster Presentation, SH21D-2849

26. *A Coupled Inner Heliosphere-Outer Heliosphere Model to Improve Computation Time in Global Heliosphere Simulations*, Siegel, S., Opher, M., van der Holst, B., **Kornbleuth, M.**, AGU Fall Meeting Abstracts, Fall 2024, Poster Presentation, SH21D-2838

27. *Inferring the Interstellar Magnetic Field Direction from Energetic Neutral Atom Observations of the Heliotail*, **Kornbleuth, M.**, Powell, E., Opher, M., et al., COSPAR 2024, July 2024, Oral Presentation, D1.2-0016-24

28. *Lyman-alpha in a "Croissant-shaped" Heliosphere*, Powell, E., Opher, M., **Kornbleuth, M.**, et al., COSPAR 2024, July 2024, Oral Presentation (Panel), PIR.1-0008-24

29. *Understanding Energetic Pickup Ion Heating and Dynamics in the Outer Heliosphere: Insights from New Horizons Observations*, Mostafavi, P., Brandt, P., Adhikari, L, Zank, G., Hill, M., Opher, M., Shrestha, B., **Kornbleuth, M.**, et al., COSPAR 2024, July 2024, Oral Presentation, D1.2-0001-24

30. *Magnetic Reconnection in the Heliosheath and at the Heliopause: Recent Analysis, Expectations, and Requirements for Thermal Ion-Electron Measurements on an Interstellar Mission*, Lavraud, B., Blanc, M., Turner, D., …, **Kornbleuth, M.**, et al., COSPAR 2024, July 2024, Poster Presentation, TWT-352

31. *Interstellar Neutral Hydrogen in the Heliosphere*, Swaczyna, P., Bzowski, M., Dialynas, K., Dyke, L., Fraternale, F., Galli, A., Heerikhuisen, J., **Kornbleuth, M.**, et al., COSPAR 2024, July 2024, Oral Presentation, D1.2-0005-24

32. *Combined in-situ particle and fields measurements with remotely sensed ENAs from a future Interstellar Probe*, Dialynas, K., Sterken, V., Brandt, P.,…,**Kornbleuth, M.**, et al., COSPAR 2024, July 2024, Oral Presentation (Panel), PIR.1-0021-24

33. *Numerical Modeling the Outer Heliosphere*, Toth, G., Opher, M., Van der Holst, B., Florinski, V., Chen, Y., & **Kornbleuth, M.**, COSPAR 2024, July 2024, Oral Presentation, D1.2-0019-24

34. *Inferring Properties of the Heliosphere and the Surrounding Interstellar Medium Using Energetic Neutral Atoms from the Heliotail*, **Kornbleuth, M.**, Opher, M., et al., ASTRONUM 2024 (16th International Conference on Numerical Modeling of Space Plasma Flows), July 2024, Oral Presentation (Solicited)

35. *Investigating the Complex Heliosheath of our Heliospheric Shield*, **Kornbleuth, M.**, Opher, M., Powell, E., et al., EGU General Assembly 2024, April 2024, Oral Presentation (Solicited), 2490

36. *Inferring the Interstellar Magnetic Field Direction from Energetic Neutral Atom Observations of the Heliotail*, **Kornbleuth, M.**, Opher, M., Dayeh, M., et al., EGU General Assembly 2024, April 2024, Poster, 6567

37. *Inferring the Interstellar Magnetic Field Direction from Energetic Neutral Atom Observations of the Heliotail*, **Kornbleuth, M.**, Opher, M., Dayeh, M., et al., AGU Fall Meeting Abstracts, December 2023, eLightning Presentation, SH51H-07

38. *Lyman-alpha Absorption in a "Croissant-like" Heliosphere*, Powell, E., Opher, M., **Kornbleuth, M.**, et al., AGU Fall Meeting Abstracts, December 2023, Oral Presentation, SH53A-08

39. *Flow Anisotropies in the Heliosheath*, Opher, M., **Kornbleuth, M.**, Decker, R. B., et al., AGU Fall Meeting Abstracts, December 2023, Oral Presentation, SH53A-05

40. *Modeling Galactic Cosmic Ray Propagation Through the Heliosphere Using Stochastic Monte Carlo Methods and an Adaptive Mesh Refined Grid*, Guzman, J. G. A., Florinski, V. A., Toth, G., Opher, M., Opher, M., **Kornbleuth, M.**, AGU Fall Meeting Abstracts, December 2023, eLightning Presentation, SH11G-06

41. *Globally Distributed Flux of ENAs at Energies Below 2 keV*, Sokol, J., Fuselier, S. A., Galli, A., Mostafavi, P., Baliukin, I., **Kornbleuth, M.**, Fairchild, K., AGU Fall Meeting Abstracts, December 2023, eLightning Presentation, SH51H-04

42. *Heating of Energetic Pickup Ions in the Supersonic Solar Wind Region by Shock Waves: Observations and Modeling*, Mostafavi, P., Zank, G. P., Hill, M., Opher, M., Brandt, P., **Kornbleuth, M.**, et al., AGU Fall Meeting Abstracts, December 2023, Poster Presentation, SH43D-3181

43. *The Resilience of the "Croissant" Heliosphere Under Solar-Cycle Varying Conditions*, Onubogu, C., Opher, **M., Kornbleuth, M.**, et al., AGU Fall Meeting Abstracts, December 2023, Poster Presentation, SH43D-3193

44. *Development Conditions of Rayleigh-Taylor Instability in Heliosheath*, Ma, X., Opher, M., **Kornbleuth, M.**, et al., AGU Fall Meeting Abstracts, December 2023, Poster Presentation, SH43D-3179

45. *Consequences of Hot Electrons for the Structure of the Outer Heliosphere*, Bair, E., Opher, M., **Kornbleuth, M.**, et al., AGU Fall Meeting Abstracts, December 2023, Poster Presentation, SH43D-3177

46. *Inferring the Interstellar Magnetic Field Direction from Energetic Neutral Atom Observations of the Heliotail*, **Kornbleuth, M.**, Opher, M., Dayeh, M., et al., Solar Heliospheric and Interplanetary Environment (SHINE) Workshop, August 2023, Poster, 250

47. *Comparison of heliosphere models with IBEX-Lo observations of Energetic Neutral Atoms at 50 eV- 2 keV energy*, Galli, A., Baliukin, I., **Kornbleuth, M.**, Fuselier, S. A.,

Sokol, J. M., Opher, M., 25th EGU General Assembly, April 2023, Poster Presentation, EGU-5688

48. *An ACR Mediated Termination Shock*, **Kornbleuth, M.**, Opher, M., Zank, G. P., Wang, B. B., Giacalone, J., Gkioulidou, M., Dialynas, K., AGU Fall Meeting Abstracts, December 2022, Poster Presentation, SH45G-2404

49. *Development and Consequences of Rayleigh-Taylor-Like Driven Instability in the Heliosheath with a Multi-Ion Treatment*, Ma, X., Opher, M., **Kornbleuth, M.**, Drake, J. F., AGU Fall Meeting Abstracts, December 2022, Poster Presentation, SH45G-2402

50. *Comparison of Lyman Alpha Absorptions in the BU and Moscow Models*, Powell, E. Opher, M., **Kornbleuth, M.**, Izmodenov, V., Baliukin, I., Wood, B. E., Toth, G., Tenishev, V., Titova, A., AGU Fall Meeting Abstracts, December 2022, Poster Presentation, SH45G-2399

51. *Effect of Photoionization on the BU Global Model of the Heliosphere*, Onubogu, C., Opher, M., **Kornbleuth, M.**, Toth, G., Sokol, J., Michael, A., AGU Fall Meeting Abstracts, December 2022, Poster Presentation, SH45G-2398

52. *A 3D Global Simulation of the Heliosphere with Hot Electrons*, Bair, E., Opher, M., **Kornbleuth, M.**, Zieger, B., Toth, G., van der Holst, B., AGU Fall Meeting Abstracts, December 2022, Poster Presentation, SH45G-2397

53. *Relating the Origin of Energetic Ions to Energetic Neutral Atoms (ENAs)*, Wang, B. B., Zank, G. P., Shrestha, B., Kornbleuth, M., Opher, M., AGU Fall Meeting Abstracts, December 2022, Poster Presentation, SH45G-2396

54. *On the Energization of Pickup Ions Downstream of the Heliospheric Termination Shock by Comparing 0.52-55 keV Observed Energetic Neutral Atom Spectra to Ones Inferred from Proton Hybrid Simulations*, Gkioulidou, M., Opher, M., **Kornbleuth, M.**, Dialynas, K., Giacalone, J., Richardson, J. D., Zank, G. P., Fuselier, S. A., Mitchell, D. G., Krimigis, S. M., Roussos, E., Baliukin, I., AGU Fall Meeting Abstracts, December 2022, Poster Presentation, SH45E-2390

55. *An ACR Mediated Termination Shock*, **Kornbleuth, M.**, Opher, M., Zank, G. P., Wang, B. B., Giacalone, J., Gkioulidou, M., Dialynas, K., 20th Annual International Astrophysics Conference, November 2022, Oral Presentation (Solicited)

56. *On the Energization of Pickup Ions Downstream of the Heliospheric Termination Shock by Comparing 0.52-55 keV Observed ENA Spectra to Simulated ENAs Inferred from Proton Hybrid Simulations*, Gkioulidou, M., Opher, M., **Kornbleuth, M.**, Dialynas, K., Giacalone, J., Richardson, J. D., Zank, G. P., Fuselier, S. A., Mitchell,

D. G., Krimigis, S. M., Roussos, E., Baliukin, I., 44th COSPAR Scientific Assembly, July 2022, Oral Presentation, D1.7-0015-22

57. *Considerations of the Global Heliopause Boundary Using Macroscopic Multipoint Voyager Observations in the Context of Microscopic, Multipoint MMS Observations at Earth's Magnetopause*, Turner, D., Eriksson, S., Lavraud, B., Provornikova, E., Michael, A., Mostafavi, P., Opher, M., **Kornbleuth, M.**, Schwadron, N., McComas, D., Hill, M., Brandt, P., Clark, G., Cohen, I., Westlake, J., 44th COSPAR Scientific Assembly, July 2022, Oral Presentation, D1.7-0014-22

58. *A Comparison of Heliotail Configurations Arising from Different Treatments of Non-ideal MHD Effects with ENA Maps at IBEX Energies*, **Kornbleuth, M. Z.**, Opher, M., Baliukin, I., Dayeh, M., Zirnstein, E., Gkioulidou, M., Dialynas, K., Galli, A., Richardson, J. D., Izmodenov, V., Zank, G. P., Fuselier, S. A., Michael, A., Toth, G., Tenishev, V., Alexashov, D., Drake, J. F., AGU Fall Meeting Abstracts, December 2021, Oral Presentation (Solicited), SH21B-02

59. *A Turbulent Heliosheath Driven by Rayleigh-Taylor Instability*, Opher, M., Drake, J. F., Zank, G. P., Toth, G., Powell, E., **Kornbleuth, M. Z.**, Florinski, V. A., Izmodenov, V., Giacalone, J., Fuselier, S., Dialynas, K., Loeb, A., Richardson, J. D., AGU Fall Meeting Abstracts, December 2021, Oral Presentation, SH21B-06

60. *Interplanetary Hydrogen Properties as Probes into the Heliospheric Interface*, Mayyasi, M., Clarke, J. T., Quemerais, E., Katushkina, O. A., Izmodenov, V., Provornikova, E., Sokol, J. M., Brandt, P. C., Galli, M., Opher, M., **Kornbleuth, M. Z.**, Linsky, J. L, Wood, B. E., AGU Fall Meeting Abstracts, December 2021, Poster, SH15F-2069

61. *A Time-Dependent Split Tail Heliosphere*, Powell, E., Opher, M., Toth, G., Tenishev, V., Michael, A., **Kornbleuth, M.**, Richardson, J. D., AGU Fall Meeting Abstracts, December 2021, Poster, SH15F-2075

62. *The Structure of the Heliosphere as Revealed by Modeled ENA Maps at IBEX Energies*, **Kornbleuth, M.**, Opher, M., Toth, G., Tenishev, V., Izmoddenov, V., Baliukin, I., Michael, A., 43rd COSPAR Scientific Assembly, January 2021, Oral Presentation, D1.3-0013-21

63. *Structure of the Heliotail*, Opher, M., Richardson, J., Krimigis, S., Toth, G., Tenishev, V., Zank, G., Drake, J., Izmodenov, V., Fuselier, S., Dialynas, K., Baliukin, I., Dayeh, M., Zieger, B., Michael, A., **Kornbleuth, M.**, Gkioulidou, M., 43rd COSPAR Scientific Assembly, January 2021, Oral Presentation, D1.2-0014-21

64. *The Effect of Changing Solar Magnetic Field Intensity on ENA Maps*, **Kornbleuth, M. Z.**, Opher, M., Michael, A. T., Sokol, J. M., Toth, G., Tenishev, V., AGU Fall Meeting Abstracts, December 2020, Poster, SH023-0008

65. *Heliospheric Ly alpha Absorption in a Split Tail Heliosphere*, Powell, E., Opher, M., Michael, A. T., **Kornbleuth, M. Z.**, Wood, B. E., Izmodenov, V., Toth, G., Tenishev, V., Richardson, J. D., AGU Fall Meeting Abstracts, December 2020, Poster, SH017-0013

66. *The Confinement of the Heliosheath Plasma by the Solar Magnetic Field as Revealed by ENAs*, **Kornbleuth, M.**, Opher, M., Michael, A.T., & Sokół. J.M., AGU Fall Meeting Abstracts, December 2019, Poster, SH51C-3335

67. *Energetic Neutral Atom Maps from the 'Croissant-like' Heliosphere*, **Kornbleuth, M.**, Opher, M., Michael, A.T., & Drake, J.F., AGU Fall Meeting Abstracts, December 2018, Poster, SH33C-3664

68. *The Energetic Neutral Atom Maps of the 'Croissant-like' Heliosphere with Jets*, **Kornbleuth, M.**, Opher, M., & Michael, A.T., AGU Fall Meeting Abstracts, December 2017, Poster, SH51D-2535

69. *The Structure of the Heliosphere with Solar Cycle and Its Effect on the Conditions in the Local ISM*, Opher, M., Drake, J.F., Toth, G., Swisdak, M., Michael, A., **Kornbleuth, M.Z.**, & Zieger, B., AGU Fall Meeting Abstracts, December 2017, Oral Presentation, SH54B-04

70. *Understanding the Heliosphere with Jets Using Energetic Neutral Atoms*, **Kornbleuth, M.**, Opher, M., & Michael, A.T., Solar Heliospheric and Interplanetary Environment (SHINE) Workshop, July 2017, Poster, 167

71. *Investigating the Effect of the Heliosphere with Jets on ENAs*, **Kornbleuth, M.**, Opher, M., Michael, A.T., & Zieger, B., AGU Fall Meeting Abstracts, December 2016, Poster, SH31A-2535

72. *Probing the Nature of Pick-up Ions (and Kappa Distribution) in the Heliosheath through Global ENA Measurements and In-site Measurements*, Opher, M., Zieger, B., Drake, J.F., **Kornbleuth, M.Z.**, & Toth, G., AGU Fall Meeting Abstracts, December 2016, Oral Presentation, SH13D-01

73. *The Heliosphere with Jets and its implications for the global Energetic Neutral Atoms Maps throughout the Solar Cycle and its impact on the large-scale draping of the interstellar magnetic field*, Opher, M., Drake, J.F., **Kornbleuth, M.Z.**, Michael, A., Zieger, B., Swisdak, M., & Toth, G., AGU Fall Meeting Abstracts, December 2016, Oral Presentation, SH23A-05

74. *Investigating the Effect of the Heliosphere with Jets on ENAs*, **Kornbleuth, M.**, Opher, M., Michael, A.T., & Zieger, B., Solar Heliospheric and Interplanetary Environment (SHINE) Workshop, July 2016, Poster, 124

75. *The Effect of the Heating and Acceleration of Winds on the Conditions Ahead of Hot Jupiters: Solar and V374 Peg Cases*, **Kornbleuth, M.**, Opher, & Evans, R.M., Solar Heliospheric and Interplanetary Environment (SHINE) Workshop, July 2015, Poster, 88

76. *Chandra Observations and Modeling of Geocoronal Charge Exchange X-Ray Emission During Solar Wind Gusts*, **Kornbleuth, M.**, Wargelin, B.J., & Juda, M., Geospace Environment Modeling (GEM) Workshop, June 2014, Poster

77. *Chandra Observations and Modeling of Geocoronal Charge Exchange X-Ray Emission During Solar Wind Gusts*, **Kornbleuth, M.**, Wargelin, B.J., & Juda, M., American Astronomical Society, AAS Meeting #224, June 2014, Poster, 321.03

Seminars and Contributed Talks

1. Magnetic Reconnection in the Heliotail and the Effect on Energetic Neutral Atoms, New Horizons Science Team Meeting #60, Lowell Observatory, Flagstaff, AZ (Remote talk)

2. *Understanding the Past and Present Heliosphere with SHIELD*, May 2025, Astronomy & Physics Seminar, Universidade Federal de Itajuba (UNIFEI), Itajuba, MG, Brazil

3. *New Horizons Modeling Review: Voyager Termination Shock Crossings*, January 2024, New Horizons Science Team Meeting #55, Johns Hopkins Applied Physics Laboratory, Laurel, MD (Remote talk)

4. *Inferring the Interstellar Magnetic Field Direction from Energetic Neutral Atom Observations of the Heliotail*, Voyager SSG Meeting, September 2023, NASA Goddard, Greenbelt, MD (Remote talk)

5. *Probing the Length of the Heliospheric Tail with Energetic Neutral Atoms (ENAs) from 0.52 to 80 keV*, May 2023, New Horizons Science Team Meeting #53, Johns Hopkins Applied Physics Laboratory, Laurel, MD (Remote talk)

6. *Probing the Length of the Heliospheric Tail with Energetic Neutral Atoms (ENAs) from 0.52 to 80 keV*, April 2023, Solar and Space Physics Seminar, Johns Hopkins Applied Physics Laboratory, Laurel, MD

7. *An Anomalous Cosmic Ray Mediated Termination Shock: Implications for Energetic Neutral Atoms*, March 2023, Voyager SSG Meeting, Caltech, Pasadena, CA (Remote talk)

8. *Using SHIELD to Study our Heliospheric Shield*, November 2020, Space Physics Seminar Series, Boston University, Boston, MA

9. *Predicting the ENAs from the Croissant Heliosphere*, November 2018, New England Space Science Consortium Meeting #27, Lowell, MA

10. *CCMC Modeling*, GEM Student Tutorial Presentation, June 2014, Geospace Environment Modeling Summer Workshop 2014, Portsmouth, VA, Invited Talk

Panels

1. High Energy ENA Facilitator, Session 6: Outer Heliosphere and Interstellar, May 5 2021, Helio 2050 Workshop

Press

1. Une Étoile Qui Nous Couve, Ciel & Espace, 16 April 2026, https://www.cieletespace.fr/article/une-etoile-qui-nous-couve

2. Scientists Reveal the Best Possible Route to Exit our Solar System, Interesting Engineering, 31 March 2024, https://interestingengineering.com/innovation/scientists-reveal-the-best-possible-route-to-exit-our-solar-system

3. How Space Probes Could Safely Leave the Comfort of our Heliosphere, Earth.com, 31 March 2024, https://www.earth.com/news/heliosphere-best-path-space-probes-beyond-solar-system/

4. Want to Leave the Solar System? Here's a Route to Take, Universe Today, 2 April 2024, https://www.universetoday.com/166453/want-to-leave-the-solar-system-heres-a-route-to-take/

5. Mapping the Best Route for a Spacecraft Traveling Beyond the Sun's Sphere of Influence, Phys.org, 29 March 2024, https://phys.org/news/2024-03-route-spacecraft-sun-sphere.html

6. 10 Holiday Gift Ideas for Kids, from BU Experts, BU Today, 13 December 2023, https://www.bu.edu/articles/2023/10-holiday-gift-ideas-for-kids-from-bu-experts/

7. Want to See Five Planets with Your Naked Eye This Week?, BU Today, 22 June 2022, https://www.bu.edu/articles/2022/see-five-planets-with-your-naked-eye-this-week/

8. Office Artifacts: Marc Kornbleuth, BU Today, 27 April 2022, https://www.bu.edu/articles/2022/office-artifacts-marc-kornbleuth/

9. NSF Program Brings Budding Astronomers to BU, BU Today, 21 July 2017, https://www.bu.edu/articles/2017/nsf-program-astronomy-mentorship

10. Under Pressure: Extreme Atmosphere Stripping May Limit Exoplanets' Habitability, Phys.org, 3 July 2017, https://phys.org/news/2017-07-pressure-extremeatmosphere-limit-exoplanets.html