



Text and Textbook Resources for CEDAR Science

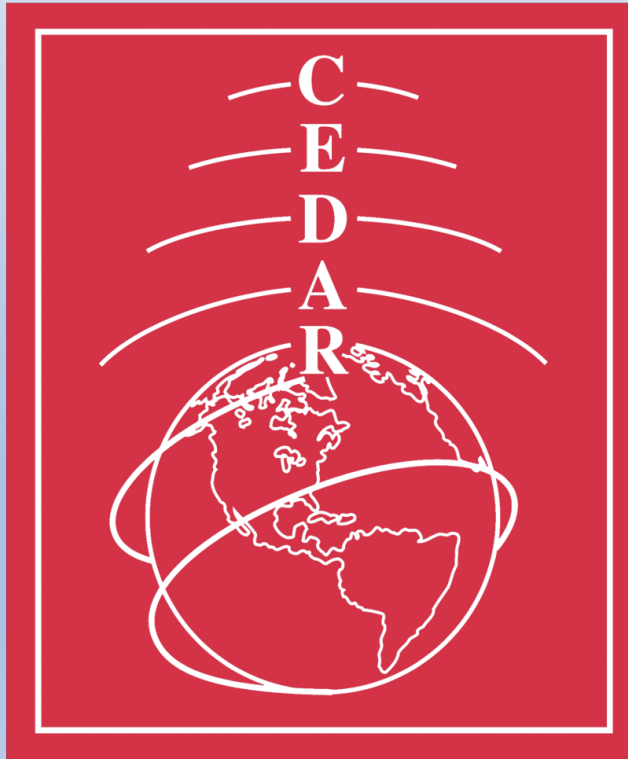


Delores Knipp, University of Colorado Boulder

Smead Aerospace Engineering Sciences Department
Space Weather Technology Research and Education Center
Colorado Center for Astrodynamics Research
Chair, CEDAR Science Steering Committee

and Dynamics of

Coupling, Energetics



Atmospheric Regions

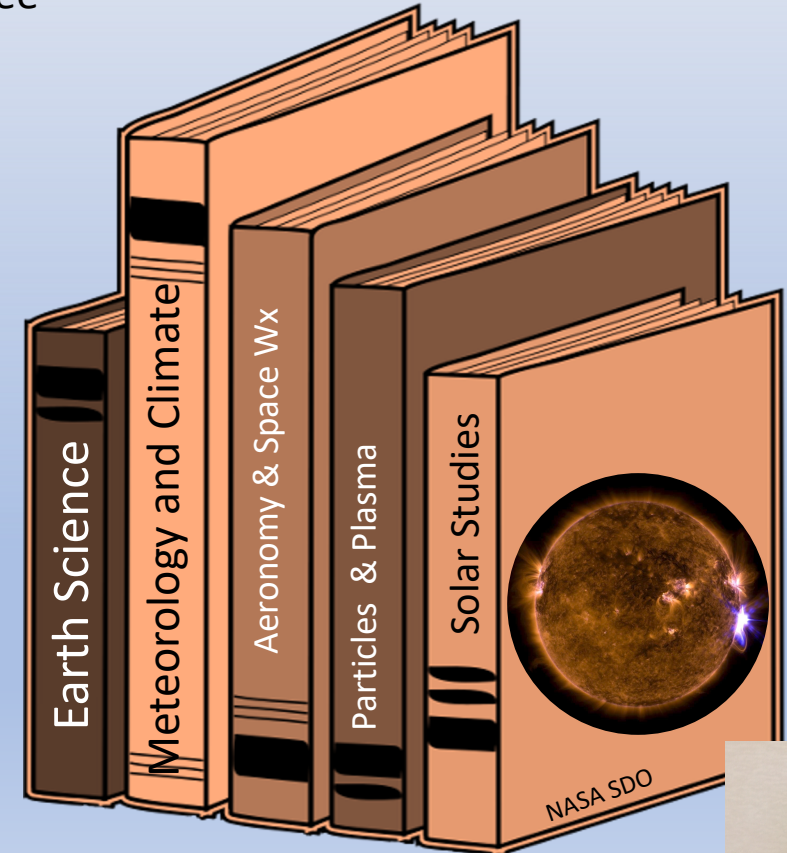
Contributions from

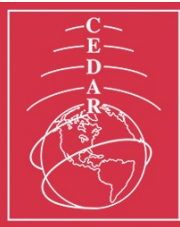
William B. (Trey) Cade, III
Baylor University

Jens Oberheide
Clemson University

CEDAR Student Day Presenters

Updated June 2021





CEDAR Virtual Meeting June 22-26

Places

Measurements

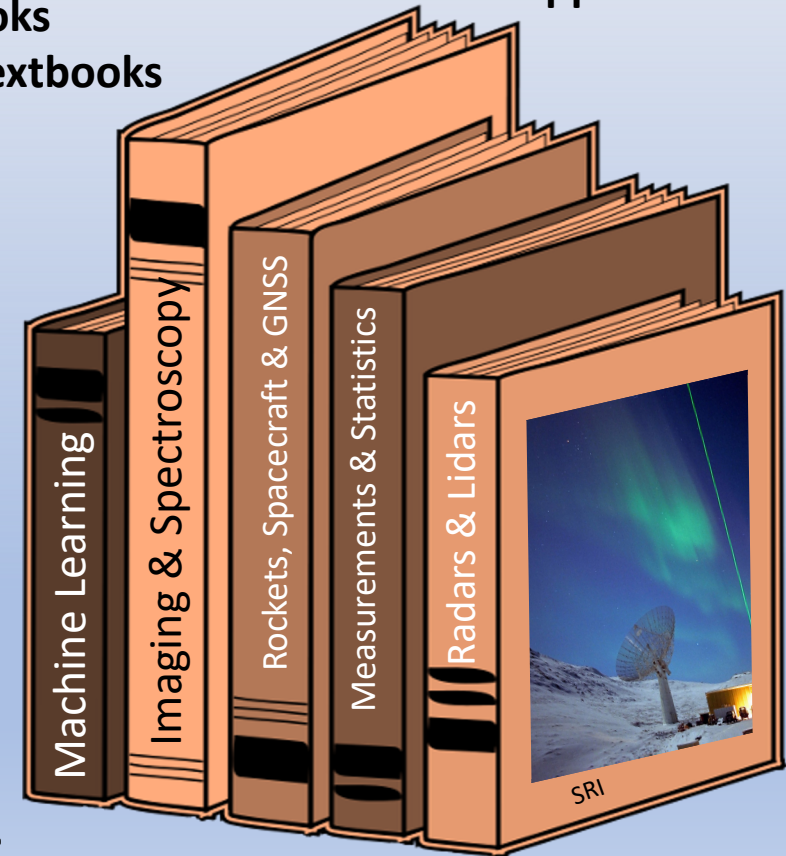
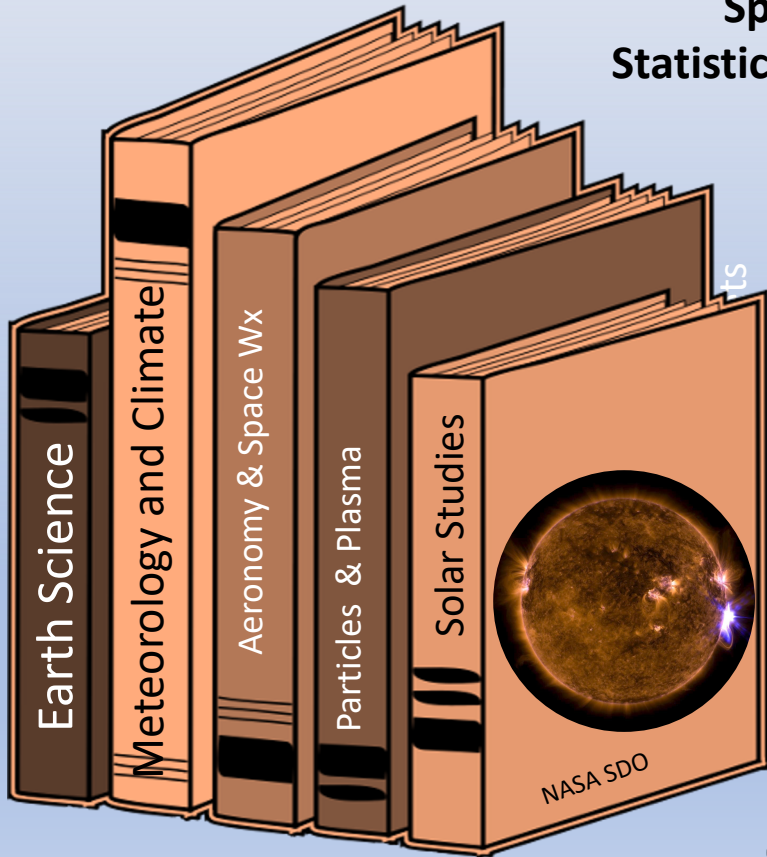
Processes

Data Science

Connections/Coupling

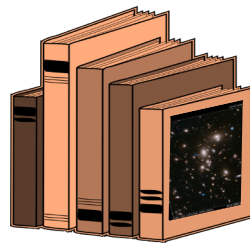
Applications

Low-Mid Atmosphere Textbooks
Tides, Waves, Chemistry Textbooks
Ionosphere, Plasma & Field Textbooks
Space Environment/Weather Textbooks
Statistics, Applications & Measurements Textbooks
Additional References



Virtual Cross-Discipline Bookshelf





Low-Mid Atmosphere Textbooks

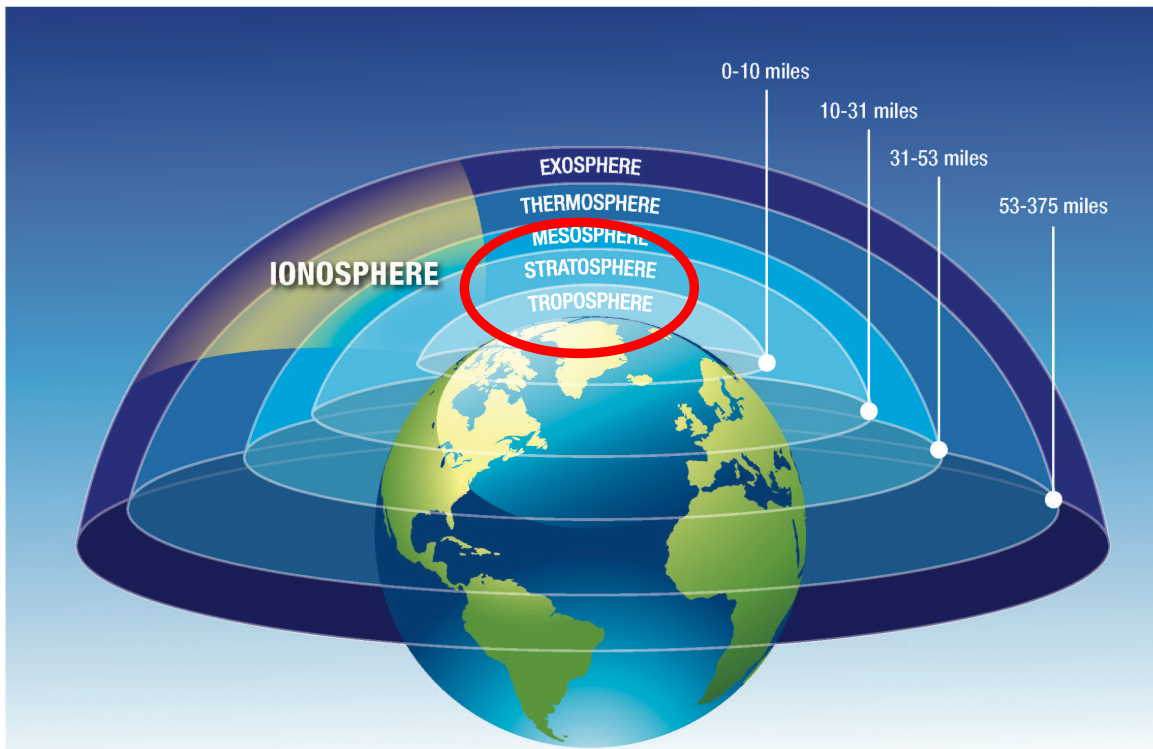
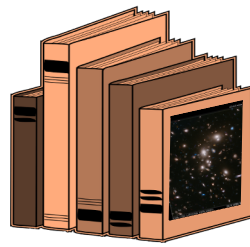


Image Courtesy of NASA

- **Introduction to Dynamic Meteorology** J. Holton (2012) 5th edition, Elsevier, 978-0-12-384866-6
- **Geophysical Fluid Dynamics**, B. Cushman-Roisin and J.-M. Beckers, (2011), Elsevier, 2nd Ed., 978-0-12-088759-0,
- **Dynamics in Atmospheric Physics**, R. Lindzen, (1990) Cambridge University Press, ISBN 9780511608285,
- **Aeronomy of the Middle Atmosphere, Chemistry and Physics of the Stratosphere and Mesosphere**, G. Brasseur and S. Solomon (2005) Springer, ISBN 978-1-4020-3284-4
- **Middle Atmosphere Dynamics**, D. Andrews. J. R. Holton and C. B. Leovy (1987), Academic Press, ISBN 9780120585762,





Tides, Waves, Chemistry & Upper Atmos Textbooks

- **Atmospheric Tides**, S. Chapman and R. Lindzen, (1970), Springer, ISBN 978-90-277-0113-8,
- **Atmospheric Tidal and Planetary Waves**, H. Volland, (1988), Springer, ISBN 978-94-009-2861
- **An Introduction to Atmospheric Gravity Waves**, C. Nappo, Elsevier, (2012) 2nd Ed. ISBN: 9780123852243
- **Physics and Chemistry of the Upper Atmosphere**, M. H. Rees (1989), Cambridge University Press, ISBN 9780511573118 ,
- **Theory of Planetary Atmospheres, An Introduction to Their Physics and Chemistry**, T. Chamberlain and D. Hunten (1989), 2nd Ed. Elsevier, ISBN: 9780080963136,

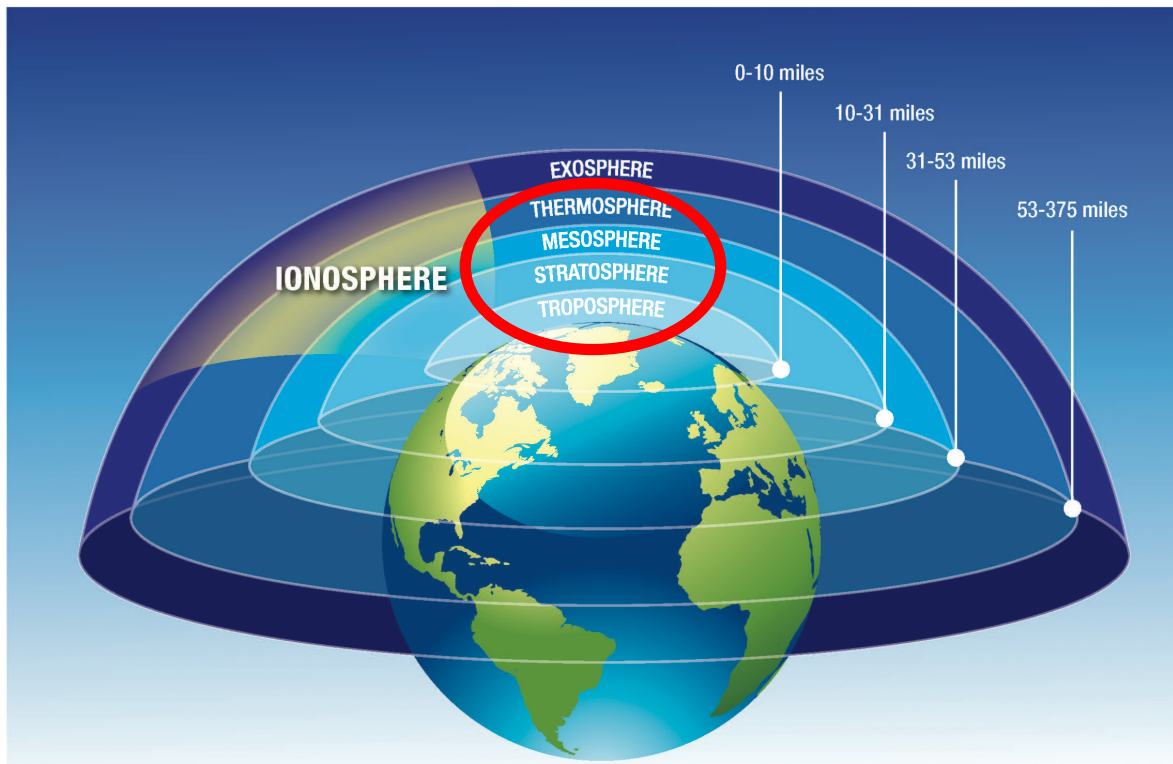
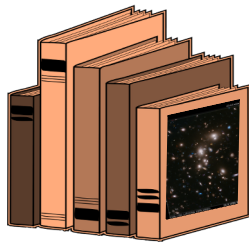


Image Courtesy of NASA





Ionosphere, Plasma & Field Textbooks

- **The Earth's Ionosphere: Plasma Physics and Electrodynamics**, M. Kelley, (2009), Academic Press ISBN: 9780120884254,
- **Ionospheres: physics, plasma physics, and chemistry** R. Schunk and A. Nagy (2018) 2nd Ed, Cambridge University Press, ISBN 978 1108462105,
- **Physics of Space Plasmas An Introduction**, G. Parks, (1991, 2019-Ebook), CRC Press, ISBN 9780429301674
- **The Solar-Terrestrial Environment: An Introduction to Geospace - the Science of the Terrestrial Upper Atmosphere, Ionosphere, and Magnetosphere** , J. K. Hargreaves (1992) , Cambridge University Press , ISBN 978-0-521427371
- **The Earth's Electric Field**, M. Kelley (2013), Elsevier Science, ISBN: 9780123978837,
- **Basic Space Plasma Physics**, W. Baumjohann and R. Treumann, (2012) 2nd Ed , Imperial College Press, ISBN 978-1-84816-895-4

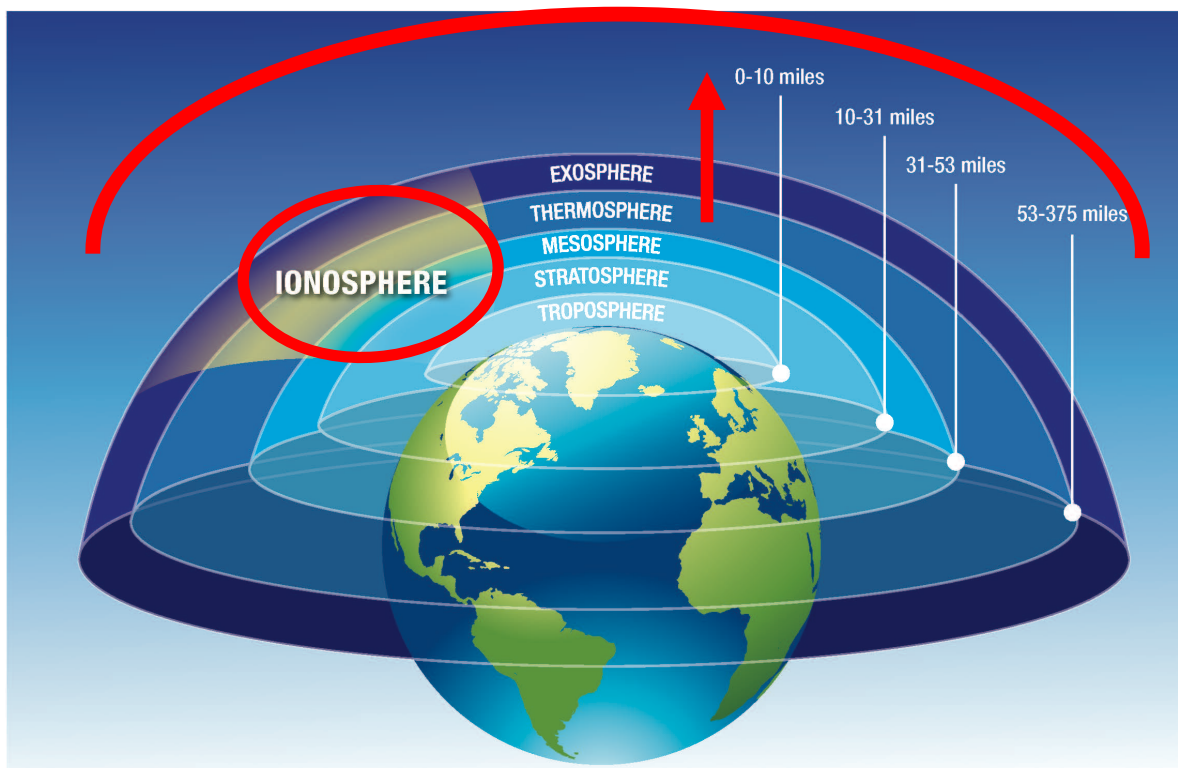
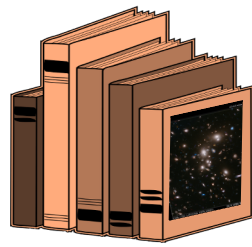


Image Courtesy of NASA





Space Environment/ Weather Textbooks

- **An Introduction to Space Weather.** M. Moldwin, (2008), Cambridge University Press, ISBN: 978-0-521-71112-8
- **Introduction to the Space Environment,** T. Tascione, (2010) 2nd Ed. Krieger Publishing, ISBN 0894640712
- **Space Weather and the Physics Behind It,** D. J. Knipp (2011), McGraw Hill, ISBN 9780073408903,
- **Space Physics: An Introduction,** C. T. Russell, J. G. Luhmann, and R. J. Strangeway, (2016), 2nd Ed, Cambridge University Press, ISBN 9781107098823,
- **Space Physics: An Introduction to Plasmas and Particles in the Heliosphere,** M.-B. Kallenrode (2004), Springer-Verlag, ISBN 978-3-642-05829-5

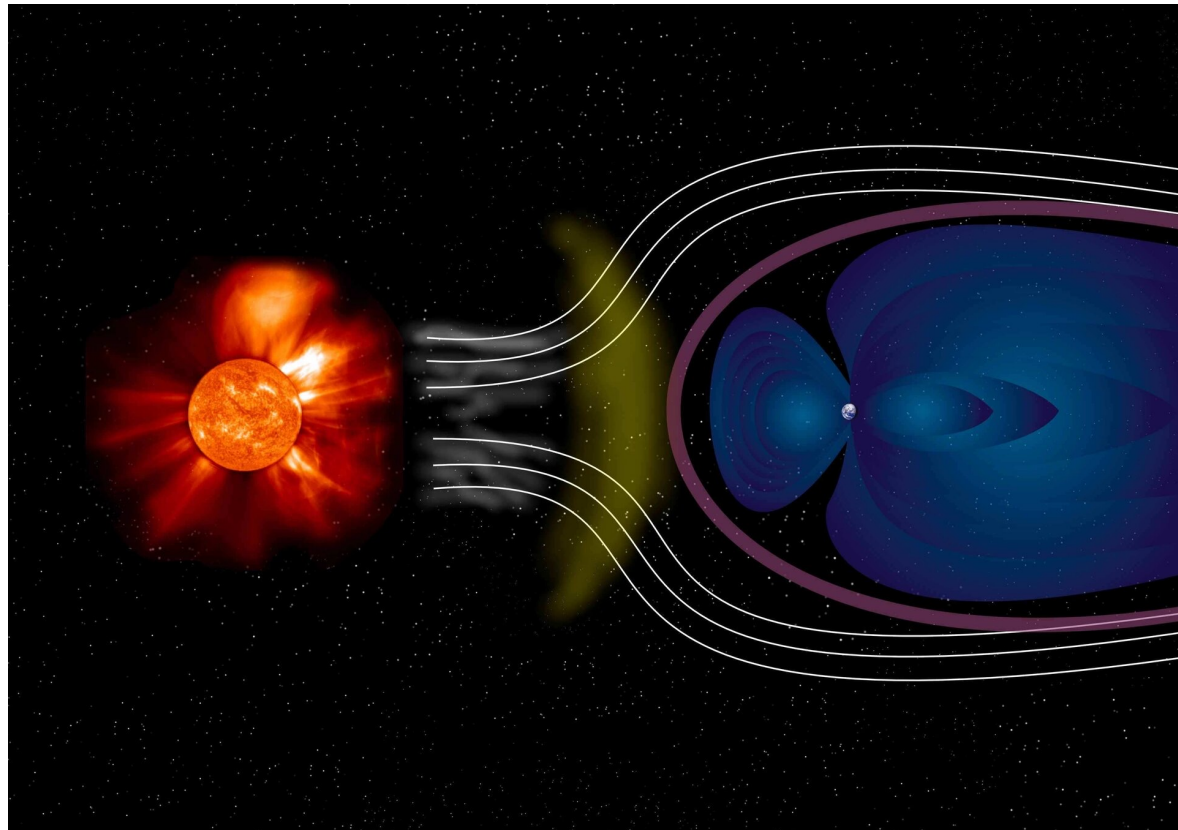
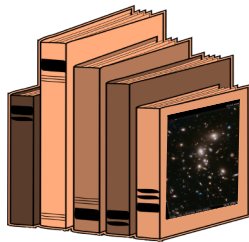
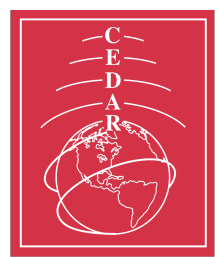


Image Courtesy of ESA





Space Environment/ Weather Textbooks

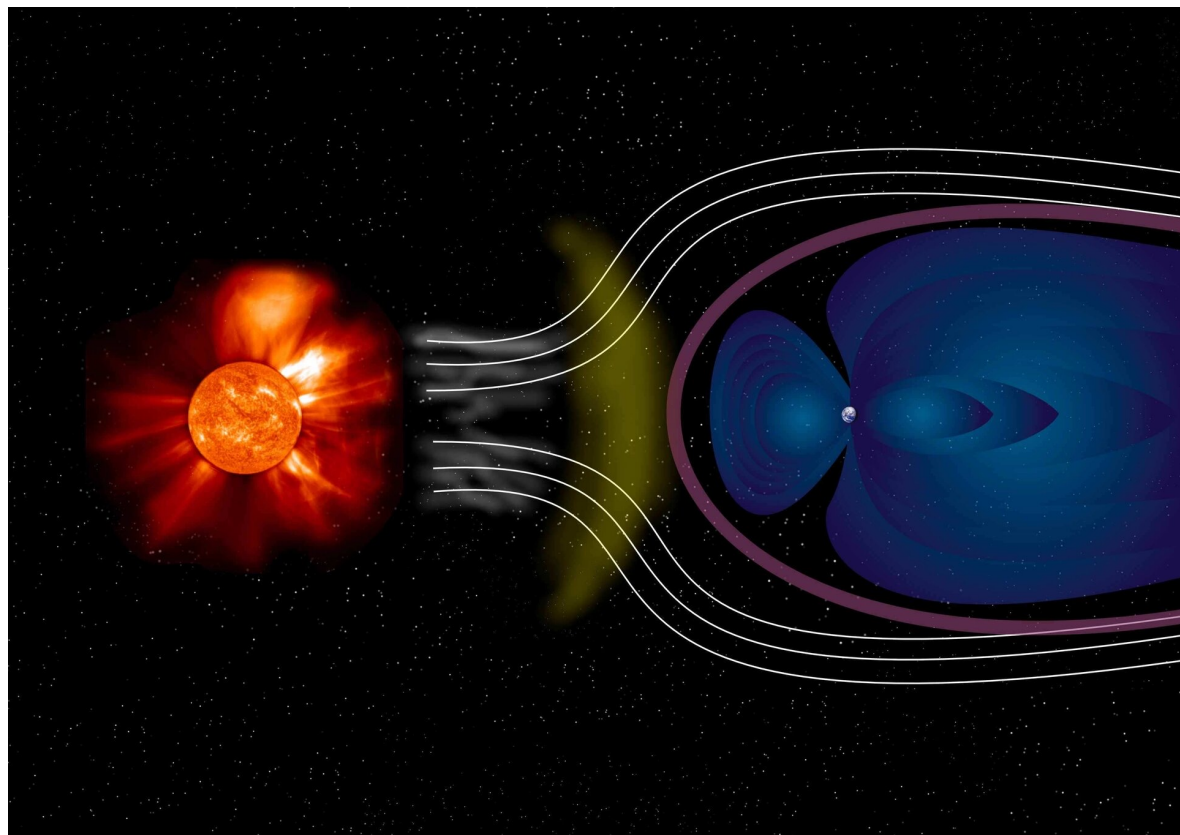
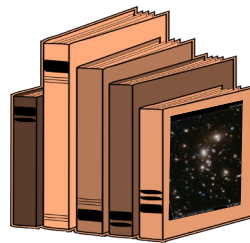


Image Courtesy of ESA

- **Physics of Space Storms: From the Solar Surface to the Earth**, H. E. J. Koskinen (2011), Springer, Heidelberg , ISBN 978-3-642-00319-6 ,
- **Space Weather**, M. Hapgood, (2017) IOP Publishing, An introduction to space weather and associated critical research topics, ISBN 978-0-7503-1372-8, FREE ACCESS,
- **Physics of the Earth's Space Environment**, G. Prolss (2003), Springer, ISBN 3-540-21426-7,
- **Physics of Solar System Plasma**, T. E. Cravens, (1997) , Cambridge University Press, ISBN 978-0521611947,
- **Physics of the Space Environment**, T. I. Gombosi (2008), Cambridge University Press, ISBN 9780511529474,





Space Environment/ Weather Textbooks

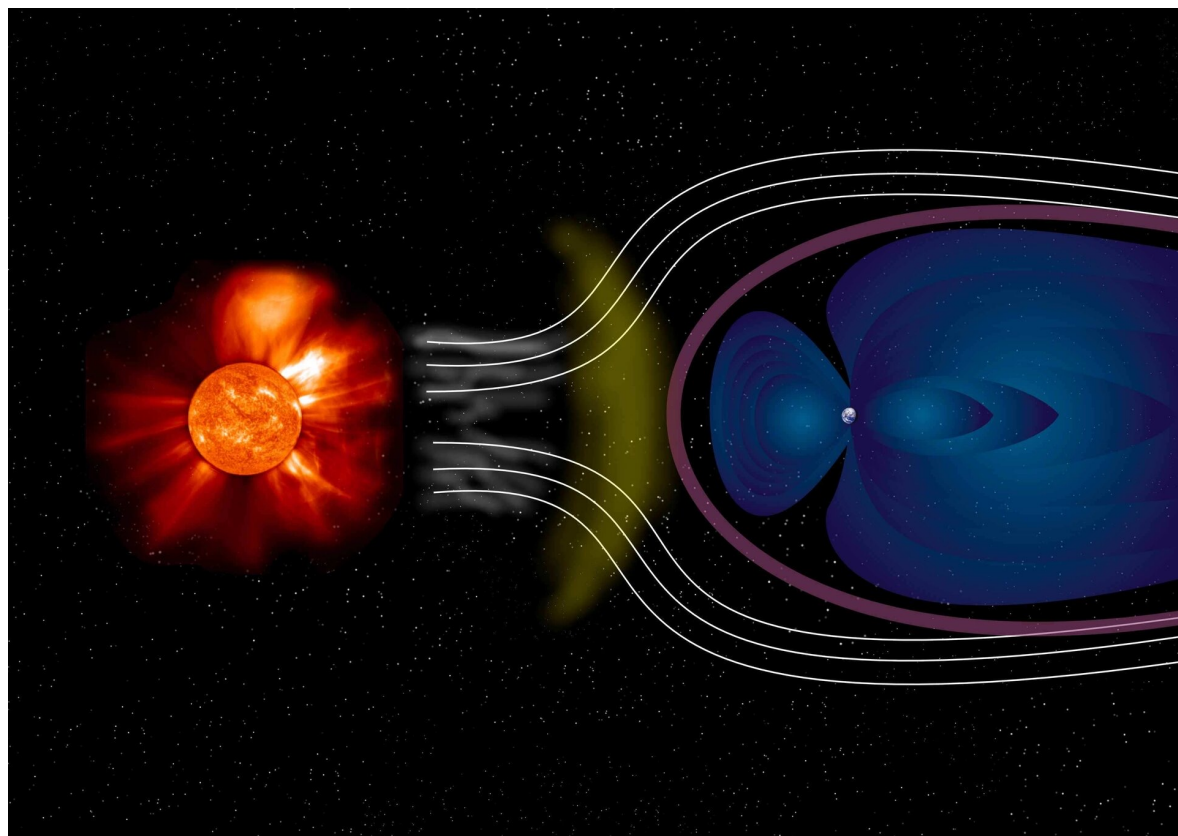
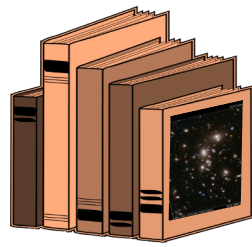


Image Courtesy of ESA

- **Heliophysics Series**, Edited by K. Schrijver, G. Sisco, F. Bagenal, and J. Sojka,, (2009-2017), Cambridge University Press,
- **Heliophysics I: plasma physics of the local cosmos**, ISBN 9780521110617
- **Heliophysics II: space storms and radiation: causes and effects** ISBN 9780521760515
- **Heliophysics III: evolving solar activity and the climates of space and earth** ISBN 9780521130202
- **Heliophysics IV: active stars, their astrospheres, and impacts on planetary environments** ISBN 9781107090477
- **Heliophysics V: space weather and society** (online only, currently FREE ACCESS, <https://cpaess.ucar.edu/sites/default/files/heliophysics/documents/HSS5.pdf>)





Statistics, Applications & Measurements Textbooks

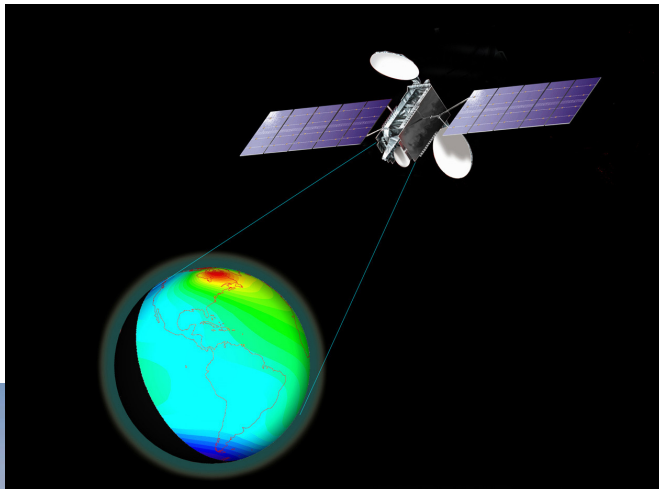
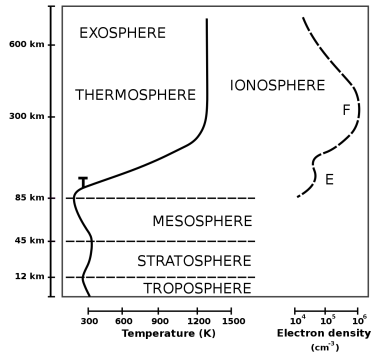


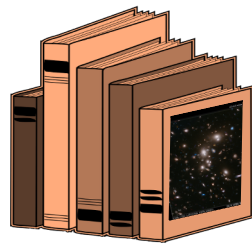
Image Courtesy of NASA/GOLD



Image Courtesy of MIT Haystack



- **Statistical Methods in the Atmospheric Sciences**, D. Wilks (2011), 3rd Ed, Elsevier, ISBN 978-0-12-385022-5
- **The High-Latitude Ionosphere and its Effects on Radio Propagation**, R. Hunsucker and J. Hargreaves, (2002) Cambridge University Press,
- **Spacecraft-Environment Interactions**, D. Hastings and H. Garrett, (1996), Cambridge: Cambridge University Press, doi:10.1017/CBO9780511525032,
- **Spectral Imaging of the Atmosphere**, G. Shepherd (2002) Elsevier, 978-0-12-639481-8
- **Introduction to Plasma Physics With Space and Laboratory Applications**, D. A. Gurnett and A. Bhattacharjee, (2005), Cambridge University Press, ISBN 9780511809125,



Statistics, Applications & Measurements Textbooks

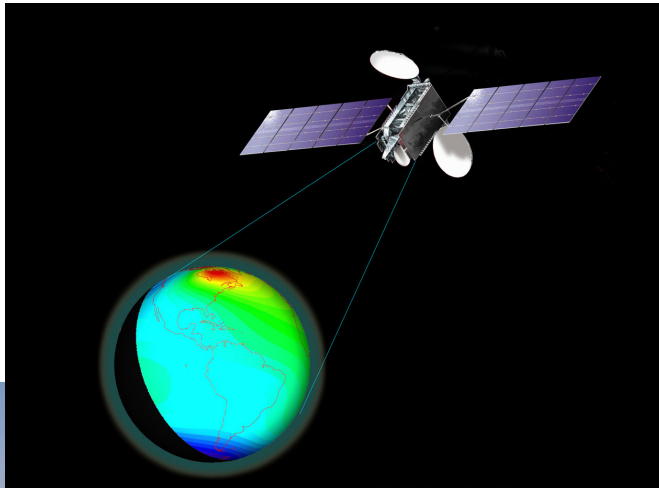
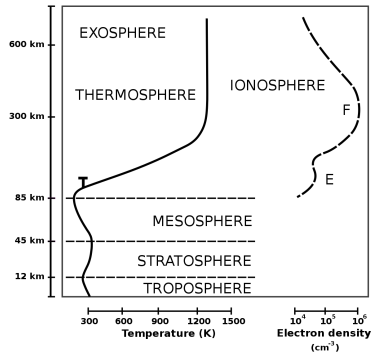


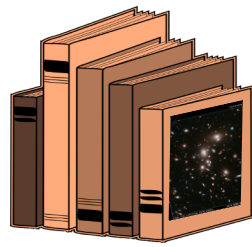
Image Courtesy of NASA/GOLD



Image Courtesy of MIT Haystack



- **The Space Environment and Its Effects on Space Systems**, V. L. Pisacane, (2018) 2nd Ed, AIAA Education Series, ISBN-10: 1624103537 T
- **Space Weather and Telecommunications**, J. M. Goodman (2005, Springer-Verlag US, ISBN 978-1-4419-3651-6,
- **Ionospheric Prediction and Forecasting**, B. Zolesi and L. R. Cander, (2014), Springer-Verlag, DOI: 10.1007/978-3-642-38430-1_3,
- **GNSS Remote Sensing: Theory, Methods and Applications**, S. Jin, E. Cardellach and F. Xie (2014), ISBN 978-94-007-7482-7,
- **Machine Learning Techniques for Space Weather**, Edited by E. Camporeale, S. Wing and J. Johnson (2018), Elsevier, ISBN: 9780128117880,



Statistics, Applications & Measurements Textbooks

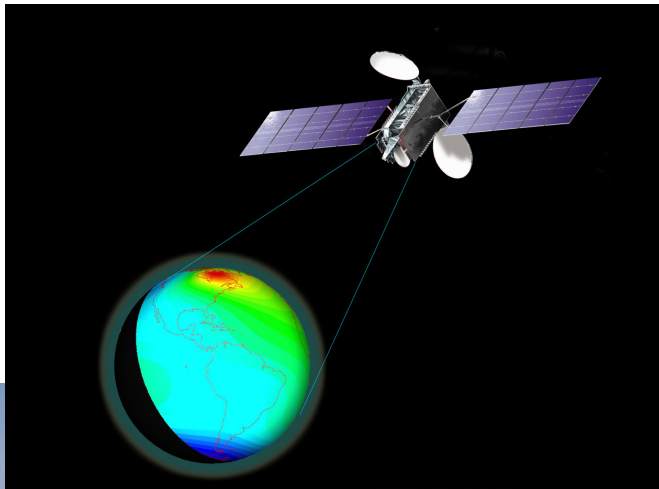
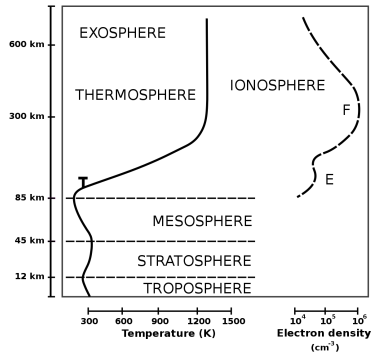


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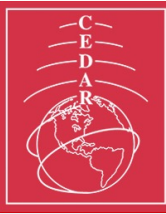
- **Global Positioning System: Signals, Measurements and Performance**, Pratap Misra & Per Enge (2006) Ganga-Jamuna, ISBN 978-0970954428
- **Space mission engineering the new SMAD**, James Wertz, Jeffrey Puschell & David Everett, (2011) Microcosm Press ISBN 9781881883166
- **Ionospheric Multi-Spacecraft Analysis Tools Approaches for Deriving Ionospheric Parameters**, Edited by M. W. Dunlop, and H. Lühr, (2020) Springer, ISBN 978-3-030-26731-5



Additional References

- **Compendium of Aeronomy**, T. Tohmatsu, Translator: T. Ogawa, (1990), Springer, ISBN 978-0-7923-0748-8
 - **Auroral Physics**, Ed. C. I. Meng, M. J. Rycroft, L. A. Frank, (1991), Cambridge University Press, ISBN: 9780521157414, re-issue softcover (2012)
 - **Wave Propagation in the Ionosphere**, K. Rawer, (1993) Springer, ISBN 978-94-017-3665-7, TOC:
 - **Solar Activity and Earth's Climate**, R. Benestad, (2002), Springer-Praxis, ISBN 3-54043-302-3
 - **Introduction to Geomagnetic Fields**, W. Campbell, (2003) Cambridge University Press, doi:10.1017/CBO9781139165136
 - **Aeronomy of the Earth's Atmosphere and Ionosphere**, Edited by M. A. Abdu, D. Pancheva, and A. Bhattacharyya (2011) Springer, ISBN 978-94-007-0325-4
 - **Atmospheric Effects in Space Geodesy**, Edited by J. Böhm, and H. Schuh, (2013), Springer ISBN 978-3-642-36931-5, TOC: <https://link.springer.com/book/10.1007%2F978-3-642-36932-2#toc>
 - **50 Years of Research at the Belgian Institute for Space Aeronomy**, Edited by Belgisch instituut voor ruimte-aeronomie -institut d'aéronomie spatiale de Belgique, (2014), ISBN: 9789090289311, <http://50.aeronomie.be/index.php/2-uncategorised/140-50-years-book>, **FREE ACCESS**
 - **Radio Wave Propagation in Ionosphere**, K. Merriman, (2016) Willford Press, ISBN 9781682850572
 - **The Dynamical Ionosphere**, M. Materassi, B. Forte, A. Coster, S. Skone, (2019) Elsevier, ISBN: 9780128147825
 - **The Dynamic Loss of Earth's Radiation Belts**, Edited by A. Jaynes and M Usanova **(2019)**, Elsevier, ISBN: 9780128133996
 - **Geomagnetism, Aeronomy and Space Weather**, Edited by M. Manda, M. Korte, A. Yau and E. Petrovsky, (2020) A special publication to mark the centenary of IUGG, Cambridge University Press, ISBN 978-1-108-41848-5 and DOI: 10.1017/978110829013
 - **Space Physics and Aeronomy, 5 Volumes, Set** , Edited by Y. Zhang and L. J Paxton, (2021) ISBN: 978-1-119-50748-2 American Geophysical Union
- **Resource List of Textbooks and Monographs Related to Space Weather and Space Weather Science**, D Knipp & W. B. Cade, III. (2020, May 25), <https://zenodo.org/record/3974720>





Summary

- CEDAR and CEDAR cross-discipline science textbooks
 - Most published since 1985
 - Representative, but likely not comprehensive
 - Table of Contents and weblink provided where possible
 - In secondary pdf
 - **Low-Mid Atmosphere Textbooks**
 - **Tides, Waves, Chemistry Textbooks**
 - **Ionosphere, Plasma & Field Textbooks**
 - **Space Environment/Weather Textbooks**
 - **Statistics, Applications & Measurements Textbooks**
 - **Additional References**
- Point of Contact to make additional recommendations: delores.knipp@Colorado.edu

