

# Ruohan Li

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## EDUCATION

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- Ph.D., Geographical Sciences, University of Maryland, College Park, Sept. 2019 - Expected May. 2024
- B.S., Honours Geomatics with Math Minor, University of Waterloo, Canada, Sept. 2017 - Jun. 2019
- B.E., Remote Sensing Science and Technology, Wuhan University, China, Sept. 2015 – Jun. 2019

## RESEARCH INTERESTS

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- Deep learning in physical-informed machine learning and spatiotemporal forecasting.
- Quantitative remote sensing based on the radiative transfer models.
- Atmosphere-surface interactions within the context of climate change.

## PUBLICATIONS

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- **Li, R.** & Wang, D. (in press). Remote sensed products of land surface downward shortwave radiation from polar-orbit and geostationary satellite data. In S. Liang (Ed.), *Comprehensive Remote Sensing*, Second Edition (Vol. 5, Remote sensing of Earth energy budget, Chapter 50006). Elsevier Inc.
- Cheng, F., Yang, Z., **Li, R.**, Wang, D., Jia, A., Li, K., Zhao, B., Wang, S., Yin, D., Li, S., Xue, W., Cribb, M., Wei J. (2023). First retrieval of 24-hourly 1-km-resolution gapless surface ozone (O<sub>3</sub>) from space in China using artificial intelligence: diurnal variations and implications for air quality and phytotoxicity. *Submitted to Remote Sensing of Environment*.
- **Li, R.**, Wang, D., Wang, Z., Liang, S., & He, J. (2023). A transformer-based approach to nowcasting solar radiation from satellite images. *In preparation*.
- **Li, R.**, Wang, D., & Liang, S. (2023). Comparison between deep learning architectures for the 1 km, 10/15-min estimation of downward shortwave radiation from AHI and ABI. *Remote Sensing of Environment*, 295, 113697. <https://doi.org/10.1016/j.rse.2023.113697>
- **Li, R.**, Wang, D., Wang, W., and Nemani, R. (2023). A GeoNEX-based high-spatiotemporal-resolution product of land surface downward shortwave radiation and photosynthetically active radiation, *Earth Syst. Sci. Data*, 15, 1419–1436, <https://doi.org/10.5194/essd-15-1419-2023>
- **Li, R.**, Wang, D., Liang, S., Jia, A., & Wang, Z. (2022). Estimating global downward shortwave radiation from VIIRS data using a transfer-learning neural network. *Remote Sensing of Environment*, 274, 112999.
- **Li, R.**, Wang, D., & Liang, S. (2021). Comprehensive assessment of five global daily downward shortwave radiation satellite products. *Science of Remote Sensing*, 4, 100028. <https://doi.org/10.1016/j.srs.2021.100028>
- Wang, D., Liang, S., **Li, R.**, & Jia, A. (2021). A synergic study on estimating surface downward shortwave radiation from satellite data. *Remote Sensing of Environment*, 264, 112639. <https://doi.org/10.1016/j.rse.2021.112639>
- Farrell, S. L., Duncan, K., Buckley, E. M., Richter-Menge, J., & **Li, R.** (2020). Mapping sea ice surface topography in high fidelity with ICESat-2. *Geophysical Research Letters*, 47(21), e2020GL090708.

## DATA PRODUCT CONTRIBUTIONS

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- MODIS/Terra+Aqua Surface Radiation Daily/3-Hour (MCD18)  
<https://lpdaac.usgs.gov/products/mcd18c2v061/>
- AHI/ABI Surface Radiation Hourly (GeoNEX DSR/PAR)  
<https://data.nas.nasa.gov/geonex/geonexdata/GOES16/GEONEX-L2/DSR-PAR/>  
<https://data.nas.nasa.gov/geonex/geonexdata/HIMAWARI8/GEONEX-L2/DSR-PAR/>
- Suomi-NPP VIIRS Surface Radiation Daily/3-Hour (VNP18A1)  
*In process*

## RESEARCH ASSISTANT EXPERIENCE

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- Graduate Research Assistant, with Dr. Dongdong Wang, UMD, Sep 2020 – now
  - Conducted research in collaboration with NASA on generating and maintaining several global downward shortwave radiation and photosynthetically active radiation products.
  - Collected and cleaned in-situ data for product assessment.
  - Analyzed spatial heterogeneity and diurnal variation of shortwave radiation at global scale.
  - Drafted user guides and addressed user questions to assist with product utilization.
- Graduate Research Assistant, with Dr. Sinead Louise Farrell, UMD, June 2020 – Sep 2020
  - Combined ICESat-2 transect with the Sentinel-2 images to indicate arctic floe size distribution and lead frequency.
  - Visualized sea ice surface topography with high fidelity to study changes in polar ice features.
- Research Assistant Internship, with Dr. Chunxiang Cao, Chinese Academy of Sciences, Aug - Oct 2018
  - Developed an innovative method to continuously detect dust extension and intensity with infrared bands using Himawari-8/AHI data during both day and night.
  - Discovered dust origin and path during the dust events in spring 2018 in China, enhancing understanding of regional atmospheric phenomena.

## TEACHING EXPERIENCE

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- Teaching Assistant
  - GEOG 330: "As the World Turns: Society and Sustainability in a Time of Great Change", UMD Winter 2021, Winter 2020, Fall 2019
  - GEOG 301: "Advanced Geographical Environmental Systems", UMD Spring 2020
  - GEOG 472: "Remote Sensing: Digital Processing and Analysis", UMD Guest lecture, Spring 2021
- Instructor
  - GEOG 276: "Principles of Python Programming and Geocomputing", UMD Expected Winter 2024

## CONFERENCES

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- Li, R., & Wang, D. Comparison between deep learning architectures for the 1 km, 10/15-min estimation of downward shortwave radiation from AHI and ABI. Poster presented at the MODIS Science Team Meeting, College Park, MD, May 2023
- Li, R., Wang, D., & Liang, S. Comprehensive assessment of five global daily downward shortwave radiation satellite products. Poster presented at American Geophysical Union Fall Meeting, New Orleans, LA, December 2021
- Attended Google Geo For Good Summit in Mountain View, CA, October 2022

## SKILLS

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- Programming languages: Linux, Python, C/C++, MATLAB, R, JavaScript
- Data analysis and model constructions: Tensorflow, PyTorch, SQL
- Spatial analysis: ArcGIS, QGIS, ENVI

## HONORS AND AWARDS

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- Ann G. Wylie Dissertation Fellowships for AY 2023-24, UMD, 2023
- Graduate School's Outstanding Graduate Assistant (OGA) Awards, UMD, 2023
- Excellence in Graduate Research Award, Department of Geographical Sciences, UMD, 2022 & 2023
- Jacob K. Goldhaber Travel Grant, UMD, 2021
- Distinguished Academic Achievement Award, University of Waterloo, 2019
- The Department of Geography and Environmental Management Scholarship, University of Waterloo, 2018
- National Scholarship (top %2), China, 2017