

WU Yue, Sophy

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Aerospace Engineering Building
2617 Wichita Street, C0600
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EDUCATION

University of Texas at Austin, Sept 2017 – May 2023 (expected)

Ph.D. candidate in Aerospace Engineering

Thesis title: Monitoring soil water and soil organic carbon storage patterns at the Arctic Foothills, Alaska, using InSAR

Advisor: Jingyi “Ann” Chen

The Chinese University of Hong Kong, Sept 2013 – June 2017

B.S. with honors in Earth System Science (First class, Major GPA: 3.8/4.0, CGPA: 3.6/4.0)

RESEARCH EXPERIENCES

Monitoring Soil Water and Organic Carbon Storage Patterns at the Arctic Foothills, Alaska, Using InSAR, Sept 2018 – now

Department of Aerospace Engineering, University of Texas at Austin, United States

- Developed an InSAR processing strategy to estimate the surface deformation related to the seasonal freezing and thawing of the surface soil.
- Demonstrated that the InSAR maximum seasonal thaw subsidence is proportional to the active layer soil water content using a large number of soil measurements collected at hard-to-access sites.
- Mapped the active layer water storage over 6500 km² region around the Toolik Field Station using InSAR and quantified the uncertainties.
- Produced a large and methodologically consistent dataset on the amounts of carbon in Arctic surface soils.

Final Year Project (City Subsidence and Groundwater Extraction), Sept 2016 – May 2017

Department of Earth System Science, the Chinese University of Hong Kong, Hong Kong, China

- Investigated the feasibility of building a hydrogeological model to better explain the relationship between city subsidence and underground water extraction.

FIELD EXPERIENCES

2018, 2019, 2022: Toolik Field Station, AK, *Monitoring Soil Water and Organic Carbon Storage Patterns at the Arctic Foothills, Alaska, Using InSAR*

- Led the 2022 field campaign.
- Developed soil sampling protocols for quantifying water holding capability and carbon storage of active layer soils.
- Collected more than 200 soil core samples within 100 km distance of the Toolik Field Station at recently burned and undisturbed field sites on foot or by helicopter.
- Installed 30 piezometers along the Imnavait Watershed and Tussock Watershed as long-term water level monitoring sites of the Arctic Long-Term Ecological Research (LTER) Program.

2016: Zhoushan, Zhejiang Province, China, *Geology Fieldwork on Zhairuoshan Island*

2015: Wutai, Shanxi Province, China, *Geology Fieldwork in Hengshan-Wutai-Fuping Complexes*

PUBLICATIONS

Journal Publications

Wu, Y., J. Chen, M. Cardenas, and G. Kling (in preparation). Catotelm thickness strongly influences the magnitude of freeze-thaw deformation observed at the Arctic Foothills.

Wu, Y., J. Chen, M. O'Connor, S. Ferencz, M. Cardenas and G. Kling (manuscript in preparation). InSAR-based active layer soil water storage estimates over the Arctic Foothills and its uncertainty.

Wu, Y., J. Chen, M. O'Connor, G. Kling and M. Cardenas (in revision). Substantial stocks of seasonally-thawed soil organic carbon may determine near-term responses of the Arctic to climate change.

Chen, J., **Y. Wu**, M. O'Connor, M. Cardenas, K. Schaefer, R. Michaelides and G. Kling (2020). Active layer freeze-thaw and water storage dynamics in permafrost environments inferred from InSAR. *Remote Sensing of Environment*, 248, 112007. doi: 10.1016/j.rse.2020.112007.

O'Connor, M. T., M. B. Cardenas, S. B. Ferencz, **Y. Wu**, B. T. Neilson, J. Chen and G. W. Kling (2020). Empirical Models for Predicting Water and Heat Flow Properties of Permafrost Soils. *Geophysical Research Letters*, 47(11). doi:10.1029/2020gl087646

Refereed Conference Proceedings

Wu, Y., J. Chen, M. O'Connor, S. Ferencz, M. Cardenas and G. Kling. The uncertainty in InSAR-based active layer soil water storage estimates over the Arctic Foothills. *IGARSS 2022*.

Wu, Y., J. Chen, M. O'Connor, S. Ferencz, G. Kling and M. Cardenas. Monitoring Soil water and organic carbon storage patterns at the Arctic Foothills, Alaska, using InSAR. *IGARSS 2020*.

AWARDED GRANTS

Future Investigators in NASA Earth and Space Science and Technology, June 2020

National Aeronautics and Space Administration

Future Investigators in NASA Earth and Space Science and Technology: NNH19ZDA001N-FINESST within the NASA Research Announcement (NRA): Research Opportunities in Space and Earth Sciences (ROSES-2019)

Chen, J. (PI), Cardenas, M. B. (Co-I), **Wu, Y. (FI)**, \$135,000 total for 3 years.

AWARDS AND FELLOWSHIPS

Warren A. and Alice L. Meyer Endowed Scholarship in Engineering <i>University of Texas at Austin, United States</i>	2022
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Raynor L. Duncombe Endowed Fellowship in Aerospace Engineering <i>University of Texas at Austin, United States</i>	2021
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Graduate Dean's Prestigious Fellowship Supplement <i>University of Texas at Austin, United States</i>	2020
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Graduate School Fellowship <i>University of Texas at Austin, United States</i>	2017
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Dean's List, 2016-2017 <i>Science faculty, the Chinese University of Hong Kong, Hong Kong, China</i>	2017
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Asia-Pacific Economic Cooperation Scholarship by the Education Bureau <i>Hong Kong, China</i>	2016
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HKSAR Government Scholarships 2016/17 <i>Hong Kong, China</i>	2016
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Dean's List, 2015-2016 <i>Science faculty, the Chinese University of Hong Kong, Hong Kong, China</i>	2016
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TEACHING EXPERIENCE

Graduate Teaching Assistant 2019 – 2021

Department of Aerospace Engineering, University of Texas at Austin, United States

- COE 301: Introduction to Computer Programming (Fall 2020).
Ran office hours, developed problem sets, and graded coursework.
- COE 379L/GEO 325K/GEO 383D/ASE 389: Computational Methods (Fall 2021).
Ran office hours, developed problem sets, and graded coursework.

INVITED TALKS

Quantifying water and organic carbon storage patterns in the active layer soils in the Arctic Foothills using InSAR, <i>NASA Jet Propulsion Laboratory (JPL) Carbon Club</i>	2020
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PRESENTATIONS

InSAR-based active layer soil water storage estimates over the Arctic Foothills, <i>2022 The NASA ISRO Synthetic Aperture Radar (NISAR) Science Workshop</i>	2022
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Monitoring soil water and organic carbon storage patterns in the active layer of the Arctic Foothills using spaceborne InSAR surface deformation data, <i>16th International Circumpolar Remote Sensing Symposium</i>	2022
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Monitoring soil water and organic carbon storage patterns of the Arctic Foothills using spaceborne InSAR surface deformation data, <i>8th ABoVE Science Team Meeting</i>	2022
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The uncertainty in InSAR-based active layer soil water storage estimates over the Arctic Foothills, <i>2021 AGU Fall Meeting</i>	2021
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The uncertainty in InSAR-based active layer soil water storage estimates over the Arctic Foothills, <i>2021 Regional Conference on Permafrost and 19th International Conference on Cold Regions Engineering</i>	2021
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Estimating soil water content in the active layer of the Arctic Foothills using spaceborne InSAR surface deformation data, <i>7th ABoVE Science Team Meeting (ASTM7)</i>	2021
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Estimating soil moisture in the active layer of the Arctic Foothills using spaceborne InSAR surface deformation data, <i>2020 AGU Fall Meeting</i>	2020
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Estimating soil organic carbon in the active layer of the Arctic Foothills using spaceborne InSAR surface deformation data, <i>Arctic LTER Winter Meeting</i>	2020
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Estimating soil organic carbon in the active layer of the Arctic Foothills using spaceborne InSAR surface deformation data, <i>2019 AGU Fall Meeting</i>	2019
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Determining the link between hydraulic properties of arctic tundra soils and Interferometric Synthetic Aperture Radar deformation measurements, <i>Arctic LTER Winter Meeting</i>	2019
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Determining the link between hydraulic properties of arctic tundra soils and Interferometric Synthetic Aperture Radar deformation measurements, <i>2018 AGU Fall Meeting</i>	2018
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ADDITIONAL INFORMATION

Languages: Mandarin (Native), English (Fluent), Cantonese (Basic), Japanese (Basic)

Programming: Matlab, Python, Fortran, C++

Computer skills: Microsoft Office Suite, ArcGIS, QGIS, Google Earth, Inkscape, VideoPad