

# WU Yue, Sophy

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Aerospace Engineering Building  
2617 Wichita Street, C0600  
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## EDUCATION

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**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

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**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 km<sup>2</sup> 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

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**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

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### ***Journal Publications***

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

**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**

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**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**

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

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## 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

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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

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

## ADDITIONAL INFORMATION

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**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