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Education

Ph.D. in Geophysics, University of Colorado at Boulder, USA 2011
 B.Sc. in Geophysics, Wuhan University, China 2005

Research Interests

- Cryosphere
- Remote Sensing
- Artificial Intelligence for Earth and Environmental Sciences
- Geodesy and Geophysics
- Planetary Geomorphology

Professional Experience

The Chinese University of Hong Kong (CUHK) 2020–present
 Associate Professor, Department of Earth and Environmental Sciences, Faculty of Science
 Head, Graduate Division of Earth and Atmospheric Sciences
 Research Fellow, Institute of Environment, Energy and Sustainability (since 2014)
 Research Fellow, Institute of Space and Earth Information Science (since 2014)
 Assistant Professor (2014–2019)

Visiting Scholar, University of Utah 2024

Visiting Scholar, Stanford University 2014–2019

George Thompson Postdoctoral Fellow, Stanford University 2011–2013

Research Assistant, University of Colorado 2006–2011

Honors and Awards (selected)

Distinguished Faculty Stay Award, Department of Geology and Geophysics, University of Utah 2024

AGU John Wahr Early Career Award 2021

Exemplary Teaching Award, Faculty of Science, CUHK 2016, 2023

George Thompson Postdoctoral Fellowship, Stanford University 2011–2013

NASA Earth and Space Science Fellowship 2008–2011

Teaching

Exploring the Earth System (ESSC1000), CUHK since Fall 2016

Solid Earth Dynamics (ESSC2010), CUHK 2014–2023

Applied Geophysics (ESSC4110 & EASC5110), CUHK since Fall 2017

Remote Sensing: Principles and Applications (ESSC4540 & EASC5540), CUHK since Fall 2014

Geodesy and Gravity (ESSC4601 & EASC5601), CUHK 2020, 22

Earth System Science (ESGS5001), CUHK since 2021

Engineering Geology and Applied Geophysics (co-taught with Teng-fong Wong), CUHK Spring 2016

Research Frontiers in Earth and Atmospheric Sciences (EASC5001/5002), CUHK 2014–2020

Hydrogeology (ESSC3220, co-taught with Teng-fong Wong), CUHK Fall 2014

Undergraduate Research Mentor, Stanford University 2012–2013

Publications (annotations: graduate students, postdocs[×], undergraduate^{*}, and visiting students[◊])

1. Liu, S., Zhao, L., Wang, L., **Liu, L.**, Zou, D., Hu, G., Sun, Z., Zhang, Y., Chen, W., Wang, X., Wang, M., Zhou, H., Qiao, Y. (2025), Ground surface deformation in permafrost region on the Qinghai-Tibet Plateau: A review, *Earth-Science Reviews*, 105109, <https://doi.org/10.1016/j.earscirev.2025.105109>.
2. Fan, C.[◊], **Liu, L.**, Zhao, Z.[×], Mu, C. (2025), Pronounced underestimation of surface deformation due to unwrapping errors over Tibetan Plateau Permafrost by Sentinel-1 InSAR: Identification and correction, *Journal of Geophysical Research: Earth Surface*, 130, e2024JF007854, <https://doi.org/10.1029/2024JF007854>.
3. Fan, C.[◊], Mu, C., **Liu, L.**, Zhang, T., Jia, S., Wang, S., Sun, W., Zhao, Z.[×] (2025), Time-Series models for ground subsidence and heave over permafrost in InSAR Processing: A comprehensive assessment and new improvement, *ISPRS Journal of Photogrammetry and Remote Sensing*, 222, 167–185, <https://doi.org/10.1016/j.isprsjprs.2025.02.019>.
4. Hu, Y.[×], Arenson, L., Barboux, C., Bodin, X., Cicoira, A., Delaloye, R., Gärtner-Roer, I., Kääb, A., Kellerer-Pirklbauer, A., Lambiel, C., **Liu, L.**, Pellet, C., Rouyet, L., Schoeneich, P., Seier, G., and Strozzi, T. (2025), Rock Glacier Velocity: An Essential Climate Variable quantity for permafrost, *Reviews of Geophysics*, 63, e2024RG000847, <https://doi.org/10.1029/2024RG000847>.
5. Zhang, Z., Jin, Q., **Liu, L.**, Wang, M., Zhang, X. (2025), Improved ALT retrieval in the Yellow River source region using time-series InSAR and multilayer soil moisture modeling, *Journal of Hydrology*, 654, 132847, <https://doi.org/10.1016/j.jhydrol.2025.132847>.
6. Streletskiy, D., Maslakov, A., Grosse, G., Shiklomanov, N., Farquharson, L., Zwieback, S., Iwahana, I., Bartsch, A., **Liu, L.**, Strozzi, T., Lee, H., and Debolskiy, M. (2025), Thawing permafrost is subsiding in the Northern Hemisphere—review and perspectives, *Environmental Research Letters*, 20, 013006, <https://doi.org/10.1088/1748-9326/ada2ff>.
7. Sun, Z., Hu, Y.[×], Racoviteanu, A., **Liu, L.**, Harrison, S., Wang, X., Cai, J., Guo, X., He, Y., and Yuan, H. (2024), TPRoGI: a comprehensive rock glacier inventory for the Tibetan Plateau using deep learning, *Earth System Science Data*, 16, 5703–5721, <https://doi.org/10.5194/essd-16-5703-2024>.
8. Ran, J., Ditmar, P., van den Broeke, M., **Liu, L.**, Klees, R., Khan, S. A., Moon, T., Li, J., Bevis, M., Zhong, M., Fettweis, X., Liu, J., Noël, B., Shum, C.K., Chen, J., Jiang, L., and van Dam, T. (2024), Vertical bedrock shifts reveal summer water storage in Greenland ice sheet, *Nature*, 635, 108–113, <https://doi.org/10.1038/s41586-024-08096-3>.
9. Chen, J., Zhang, J., Wu, T., **Liu, L.**, Zhang, F., Hao, J., Huang, L., Wu, X., Wang, P., Xia, Z., Zhu, X., and Lou P. (2024), Elevation-dependent shift of landslide activity in mountain permafrost regions of the Qilian Mountains, *Advances in Climate Change Research*, 15(6), 1067–1077, doi:10.1016/j.accre.2024.11.003.
10. Xia, Z., **Liu, L.**, Mu, C., Peng, X., Zhao, Z., Huang, L., Luo, J., and Fan, C. (2024), Widespread and rapid activities of retrogressive thaw slumps on the Qinghai-Tibet Plateau from 2016 to 2022, *Geophysical Research Letters*, 51, e2024GL109616, <https://doi.org/10.1029/2024GL109616>.
11. Xu, X.[×], **Liu, L.**, Huang, L., and Hu, Y.[×] (2024), Combined Use of multi-source satellite imagery and deep learning for automated mapping of glacial lakes in the Bhutan Himalaya, *Science of Remote Sensing*, 10, 100157, <https://doi.org/10.1016/j.srs.2024.100157>.
12. Zwieback, S., **Liu, L.**, Rouyet, L., Short, N., and Strozzi, T. (2024), Advances in InSAR analysis of permafrost terrain, *Permafrost and Periglacial Processes*, <https://doi.org/10.1002/ppp.2248>.
13. Tang, Q., Zhang, G., Yao, T., Wieland, M., **Liu, L.**, and Kaushik, S. (2024), Automatic extraction of glacial lakes from Landsat imagery using deep learning across the Third Pole region, *Remote Sensing of Environment*, 315, 114413, <https://doi.org/10.1016/j.rse.2024.114413>.
14. Ye, Q., Wang, Y., **Liu, L.**, Guo, L., Zhang, X., Dai, L., Zhai, L., Hu, Y., Ali, N., Ji, X., Ran, Y., Qiu, Y., Shi, J., Che, T., Wang, N., Li, X., and Zhu, L. (2024), Remote sensing and modeling of the Cryosphere in High Mountain Asia: A multidisciplinary review, *Remote Sensing*, 16, 1709, <https://doi.org/10.3390/rs16101709>.
15. Ran, J., **Liu, L.**, Zhang, G., Shum, C.K., Qiu, J., Hu, R., Li, J., Peng, J., Hwang, C., Luan, Y.,

- Sun, Y., Xu, M., Chen, D., Ding, J., and Zhong, Y. (2024), Contrasting lake changes in Tibet revealed by recent multi-modal satellite observations, *Science of The Total Environment*, 908, 168342, <https://doi.org/10.1016/j.scitotenv.2023.168342>.
16. Hu, Y.[×], **Liu, L.**, Huang, L., Zhao, L., Wu, T., Wang, X., and Cai, J. (2023), Mapping and characterizing rock glaciers in the arid Western Kunlun Mountains supported by InSAR and deep learning, *Journal of Geophysical Research: Earth Surface*, 128, e2023JF007206, <https://doi.org/10.1029/2023JF007206>.
 17. Hu, Y.[×], Harrison, S., **Liu, L.**, and Wood, J. L. (2023), Modelling rock glacier ice content based on InSAR-derived velocity, Khumbu and Lhotse valleys, Nepal, *The Cryosphere*, 17, 2305–2321, <https://doi.org/10.5194/tc-17-2305-2023>.
 18. Luo, X., Hu, Z., and **Liu, L.** (2023), Investigating the seasonal dynamics of surface water over the Qinghai-Tibet Plateau using Sentinel-1 imagery and a novel gated multiscale ConvNet, *International Journal of Digital Earth*, 16(1), 1373–1395, <https://doi.org/10.1080/17538947.2023.2198266>.
 19. Wu, Z., Ma, P., Zheng, Y., Gu, F., **Liu, L.**, and Lin, H. (2023), Automatic detection and classification of land subsidence in deltaic metropolitan areas using distributed scatterer InSAR and Oriented R-CNN, *Remote Sensing of Environment*, 290, 113545, <https://doi.org/10.1016/j.rse.2023.113545>.
 20. Xia, Z., Huang, L.[×], Fan, C., Jia, S., Lin, Z., **Liu, L.**, Luo, J., Niu, F., and Zhang, T. (2022), Retrogressive thaw slumps along the Qinghai-Tibet Engineering Corridor: A comprehensive inventory and their distribution characteristics, *Earth System Science Data*, 14, 3875–3887, <https://doi.org/10.5194/essd-14-3875-2022>.
 21. Chen, J., Wu, T., **Liu, L.**, Gong, W., Zwieback, S., Zou, D., Zhu, X., Hu, G., Du, E., Wu, X., Li, R., and Yang S. (2022), Increased water content in the active layer revealed by regional-scale InSAR and independent component analysis on the central Qinghai-Tibet Plateau, *Geophysical Research Letters*, 49, e2021GL097586, <https://doi.org/10.1029/2021GL097586>.
 22. Bolch, T., Yao, T., Bhattacharya, A., Hu, Y., King, O., **Liu, L.**, Pronk, J. B., Rastner, P., and Zhang, G. (2022), Earth observation to investigate occurrence, characteristics and changes of glaciers, glacial lakes and rock glaciers in the Poiqu River Basin (Central Himalaya), *Remote Sensing*, 14, 1927, <https://doi.org/10.3390/rs14081927>.
 23. Lai, Y., Zhang, B., Yao, Y., **Liu, L.**, Yan, X., He, Y., and Ou, S. (2022), Reconstructing the data gap between GRACE and GRACE Follow-On at the basin scale using artificial neural network, *Science of The Total Environment*, 153770, <https://doi.org/10.1016/j.scitotenv.2022.153770>.
 24. Chen, J., Wu, T., Zou, D., **Liu, L.**, Wu, X., Gong, W., Zhu, X., Li, R., Hao, J., Hu, G., Pang, Q., Zhang, J., and Yang, S. (2022), Magnitudes and patterns of large-scale permafrost ground deformation revealed by Sentinel-1 InSAR on the central Qinghai-Tibet Plateau, *Remote Sensing of Environment*, 268, 112778, <https://doi.org/10.1016/j.rse.2021.112778>.
 25. Wang, X., **Liu, L.**, Hu, Y., Wu, T., Zhao, L., Liu, Q., Zhang, R., Zhang, B., and Liu, G. (2021), Multi-decadal geomorphic changes of a low-angle valley glacier in East Kunlun Mountains: remote sensing observations and detachment hazard assessment, *Natural Hazards and Earth System Sciences*, 21, 2791–2810, <https://doi.org/10.5194/nhess-21-2791-2021>.
 26. Jia, S., Zhang, T., Fan, C., **Liu, L.**, and Shao, W. (2021), Research Progress of InSAR Technology in Permafrost, *Advances in Earth Science* (in Chinese), 36(7), 694–711, <https://doi.org/10.11867/j.issn.1001-8166.2021.055>.
 27. Rouyet, L., **Liu, L.**, Strand, S. M., Christiansen, H. H., Lauknes, T. R., and Larsen, Y. (2021), Seasonal InSAR displacements documenting the active layer freeze and thaw progression in central-western Spitsbergen, Svalbard, *Remote Sensing*, 13, 2977, <https://doi.org/10.3390/rs13152977>.
 28. Ran, J., Ditmar, P., **Liu, L.**, Xiao, Y., Klees, R., and Tang, X. (2021), Analysis and mitigation of biases in Greenland ice sheet mass balance trend estimates from GRACE mascon products, *Journal of Geophysical Research: Solid Earth*, 126, e2020JB020880, <https://doi.org/10.1029/2020JB020880>.
 29. Zhang, J., **Liu, L.**, Su, L., and Che, T. (2021), Three in one: GPS-IR measurements of ground surface

- elevation changes, soil moisture, and snow depth at a permafrost site in the northeastern Qinghai–Tibet Plateau, *The Cryosphere*, 15, 3021–3033, <https://doi.org/10.5194/tc-15-3021-2021>.
30. Huang, L.[×], **Liu, L.**, Luo, J., Lin, Z., and Niu, F. (2021), Automatically quantifying evolution of retrogressive thaw slumps in Beiluhe (Tibetan Plateau) from multi-temporal CubeSat images, *International Journal of Applied Earth Observations and Geoinformation*, 102, 102399, <https://doi.org/10.1016/j.jag.2021.102399>.
 31. Xu, X., **Liu, L.**, Schaefer, K., and Michaelides, R. (2021), Comparison of surface subsidence measured by airborne and satellite InSAR over permafrost areas near Yellowknife Canada, *Earth and Space Science*, 8, e2020EA001631, <https://doi.org/10.1029/2020EA001631>.
 32. Michaelides, R. J., Chen, R. H., Zhao, Y., Schaefer, K., Parsekian, A. D., Sullivan, T., Moghaddam, M., Zebker, H. A., **Liu, L.**, Xu, X., and Chen, J. (2021), Permafrost Dynamics Observatory (PDO) – Part I: Postprocessing and calibration methods of UAVSAR L-band InSAR data for seasonal subsidence estimation, *Earth and Space Science*, 8, e2020EA001630, <https://doi.org/10.1029/2020EA001630>.
 33. Clayton, L. K., Schaefer, K., Battaglia, M. J., Bourgeau-Chavez, L., Chen, J., Chen, R. H., Chen, A., Bakian-Dogaheh, K., Grelik, S., Jafarov, E., **Liu, L.**, Michaelides, R. J., Moghaddam, M., Parsekian, A., Rocha, A. V., Schaefer, S. R., Sullivan, T., Tabatabaenejad, A., Wang, W., Wilson, C., Zebker, H. A., Zhang, T., and Zhao, Y. (2021), Active layer thickness as a function of soil water content, *Environmental Research Letters*, 16, 055028, <https://doi.org/10.1088/1748-9326/abfa4c>.
 34. Jiang, G., **Liu, L.**, Barbour, A., Yang, H., and Lu, R. (2021), Physics-based evaluation of the maximum magnitude of potential earthquakes induced by the Hutubi (China) underground gas storage, *Journal of Geophysical Research: Solid Earth*, 126, e2020JB021379, <https://doi.org/10.1029/2020JB021379>.
 35. Zhang, J. and **Liu, L.** (2021), Mining noise data for monitoring Arctic permafrost by using GNSS interferometric reflectometry, *Polar Science*, 29, 100649, <https://doi.org/10.1016/j.polar.2021.100649>.
 36. Zhang, B., Yao, Y., **Liu, L.**, and Yang, Y. (2021), Interannual ice mass variations over the Antarctic ice sheet from 2003 to 2017 were linked to El Niño–Southern Oscillation, *Earth and Planetary Science Letters*, 560, 116796, <https://doi.org/10.1016/j.epsl.2021.116796>.
 37. Zhang, E., **Liu, L.**, Huang, L.[×], and Ng, K. S.* (2021), An automated, generalized, deep-learning-based method for delineating the calving fronts of Greenland glaciers from multi-sensor remote sensing imagery, *Remote Sensing of Environment*, 254, 112265, <https://doi.org/10.1016/j.rse.2020.112265>.
 38. Liu, W., Chen, X., Ran, J., **Liu, L.**, Wang, Q., Xin, L., Li, G. (2021), LaeNet: A novel lightweight multitask CNN for automatically extracting lake area and shoreline from remote sensing images, *Remote Sensing*, 13, 56, <https://doi.org/10.3390/rs13010056>.
 39. Hu, Y., **Liu, L.**, Wang, X., Zhao, L., Wu, T., Cai, J., Zhu, X. and Hao, J. (2021), Quantification of permafrost creep provides kinematic evidence for classifying a puzzling periglacial landform, *Earth Surface Processes and Landforms*, 46, 465–477, <https://doi.org/10.1002/esp.5039>.
 40. Khan, S. A., Bjørk, A.A., Bamber, J.L., Morlighem, M., Bevis, M., Kjær, K.H., Mouginot, J., Løkkegaard, A., Holland, D.M., Aschwanden, A. and Zhang, B., Helm, V., Korsgaard, N., Colgan, W., Larsen, N., **Liu, L.**, Hansen, K., Barletta, V., Dahl-Jensen, T., Søndergaard, A. S., Csatho, B., Sasgen, I., Box, J., and Schenk, T. (2020), Centennial response of Greenland’s three largest outlet glaciers, *Nature Communications*, 11, 5718, <https://doi.org/10.1038/s41467-020-19580-5>.
 41. Zhang, B., **Liu, L.**, Yao, Y., van Dam, T., and Khan, S. A. (2020), Improving the estimate of the secular variation of Greenland ice mass in the recent decades by incorporating a stochastic process, *Earth and Planetary Science Letters*, 549, 116518, <https://doi.org/10.1016/j.epsl.2020.116518>.
 42. Zhang, J., **Liu, L.**, and Hu, Y. (2020), Global Positioning System interferometric reflectometry (GPS-IR) measurements of ground surface elevation changes in permafrost areas in northern Canada, *The Cryosphere*, 14, 1875–1888, <https://doi.org/10.5194/tc-14-1875-2020>.
 43. Huang, L., Luo, J., Lin, Z., Niu, F., and **Liu, L.** (2020), Using Deep Learning to Map Retrogressive Thaw Slumps in the Beiluhe Region (Tibetan Plateau) from CubeSat Images, *Remote Sensing of Environment*, 237, 111534, <https://doi.org/10.1016/j.rse.2019.111534>.

44. Jiang, G.[×], Qiao, X., Wang, X., Lu, R., **Liu, L.**, Yang, H., Su, Y., Song, L., Wang, B., and Wong, T-f. (2020), GPS observed horizontal ground extension at the Hutubi (China) underground gas storage facility and its application to geomechanical modeling for induced seismicity, *Earth and Planetary Science Letters*, 530, 115943, <https://doi.org/10.1016/j.epsl.2019.115943>.
45. Huang, L., Baud, P., Cordonnier, B., Renard, F., **Liu, L.**, and Wong, T-f. (2019), Synchrotron X-ray imaging in 4D: Multiscale failure and compaction localization in triaxially compressed porous limestone, *Earth and Planetary Science Letters*, 528, 115831, <https://doi.org/10.1016/j.epsl.2019.115831>.
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47. Zhou, Z.[×], **Liu, L.**, Jiang, L., Feng, W., and Samsonov, S.V. (2019), Using long-term SAR backscatter data to monitor post-fire vegetation recovery in tundra environment, *Remote Sensing*, 11(19), 2230, <https://doi.org/10.3390/rs11192230>.
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55. Ran, J.[×], Vizcaino, M., Ditmar, P., van den Broeke, M. R., Moon, T., Steger, C. R., Enderlin, E. M., Wouters, B., Noël, B., Reijmer, C. H., Klees, R., Zhong, M., **Liu, L.**, and Fettweis, X. (2018) Seasonal mass variations show timing and magnitude of meltwater storage in the Greenland ice sheet, *The Cryosphere*, 12, 2981–2999, <https://doi.org/10.5194/tc-12-2981-2018>.
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Book Chapters:

84. van Dam, T., Whitehouse, P., and **Liu, L.** (2024), GNSS and the Cryosphere, in *GNSS Monitoring of the Terrestrial Environment: Earthquakes, Volcanoes, and Climate Changes*, C. Kreemer and Y. Aoki, Elsevier.
85. **Liu, L.** (2021), A review of Deep Learning for Cryospheric Studies, in *Deep Learning for the Earth Sciences*, G. Camps-Valls, D. Tuia, X. X. Zhu, and M. Reichstein, Eds., Wiley & Sons. <https://doi.org/10.1002/9781119646181.ch17>.

Published Codes and Data Products (selected):

86. Fan, C., and **Liu, L.** (2024). FanInSAR: A Fancy InSAR time series library, in a Pythonic, fast, and flexible way (0.0.1). Zenodo. <https://doi.org/10.5281/zenodo.11398347>
87. Sun, Z., Hu, Y., Racoviteanu, A., **Liu, L.**, Harrison, S., Wang, X., Cai, J., Guo, X., He, Y., and Yuan, H. (2024), TPRoGI: a comprehensive rock glacier inventory for the Tibetan Plateau using deep learning (1.0). Zenodo, <https://doi.org/10.5281/zenodo.10732042>.
88. Xia, Z., **Liu, L.**, Mu, C., Peng, X., Zhao, Z., Huang, L., Luo, J., and Fan, C. (2024), Annual inventories of retrogressive thaw slumps across the Qinghai-Tibet Plateau from 2016 to 2022. Zenodo, <https://doi.org/10.5281/zenodo.10928346>.
89. Zhao, Z., Fan, C., **Liu, L.** (2023), Geo SAM: A QGIS plugin using Segment Anything Model (SAM) to accelerate geospatial image segmentation (1.1.0). Zenodo, <https://doi.org/10.5281/zenodo.8191039>.

90. Xia, Z., Huang, L., **Liu, L.** (2021), An Updated Inventory of Retrogressive Thaw Slumps Along the Vulnerable Qinghai-Tibet Engineering Corridor. Zenodo, <https://doi.org/10.5281/zenodo.6397029>.
91. Schaefer, K., R.J. Michaelides, R.H. Chen, T.D. Sullivan, A.D. Parsekian, Y. Zhao, K. Bakian-Dogaheh, A. Tabatabaenejad, M. Moghaddam, J. Chen, A.C. Chen, **L. Liu**, and H.A. Zebker (2021), ABoVE: Active Layer Thickness Derived from Airborne L- and P-band SAR, Alaska, 2017. ORNL DAAC, Oak Ridge, Tennessee, USA. <https://doi.org/10.3334/ORNLDAAC/1796>.
92. Zhang, J. and **Liu, L.** (2020), Reflector heights in the Arctic permafrost areas measured by GNSS interferometric reflectometry. Zenodo, <https://doi.org/10.5281/zenodo.4319372>.
93. Zhang, J., **Liu, L.**, Y. Hu (2019), Reflector heights measured by GPS-IR at Alert, Resolute Bay, Repulse Bay, Baker Lake, and Iqaluit in northern Canada. PANGAEA, <https://doi.org/10.1594/PANGAEA.904347>.
94. **Liu, L.**, K. M. Larson (2018), Surface elevation changes near Barrow (Alaska) measured using reflected GPS signals. PANGAEA, <https://doi.pangaea.de/10.1594/PANGAEA.885935>.
95. Hu, Y., **Liu, L.**, K. M. Larson (2018), The decadal reflector heights for SG27 in Barrow, Alaska (2007-2016). PANGAEA, <https://doi.pangaea.de/10.1594/PANGAEA.884941>.
96. Schaefer, K., R.J. Michaelides, R.H. Chen, T. Sullivan, A.D. Parsekian, K. Bakian-dogaheh, A. Tabatabaenejad, M. Moghaddam, J. Chen, A.C. Chen, **Liu, L.** and H.A. Zebker (2019), ABoVE: Active Layer Thickness Derived from Airborne L- and P-band SAR, Alaska, 2017. ORNL DAAC, Oak Ridge, Tennessee, USA. <https://doi.org/10.3334/ORNLDAAC/1676>.
97. Zhang, B., **Liu, L.**, S. A. Khan, T. van Dam, E. Zhang, and Y. Yao (2017), GPS and GRACE inferred uplifts and extracted transient and seasonal signals due to glacial mass change near Upernavik Isstrm, PANGAEA, <https://doi.org/10.1594/PANGAEA.880159>.
98. Wang, X., **Liu, L.**, L. Zhao, T. Wu, Z. Li, and G. Liu (2017), An inventory of active rock glaciers in the northern Tien Shan of China compiled using satellite SAR interferometry, PANGAEA, <https://doi.pangaea.de/10.1594/PANGAEA.874616>.
99. Jafarov, E., A. Parsekian, K. Schaefer, **Liu, L.**, A. Chen, S.K. Panda, and T. Zhang (2016), Pre-ABoVE: Active Layer Thickness and Soil Water Content, Barrow, Alaska, 2013. ORNL DAAC, Oak Ridge, Tennessee, USA. <http://dx.doi.org/10.3334/ORNLDAAC/1355>.
100. Chen, A., A. Parsekian, K. Schaefer, E. Jafarov, S.K. Panda, **Liu, L.**, T. Zhang, and H.A. Zebker. 2015. Pre-ABoVE: Ground-penetrating Radar Measurements of ALT on the Alaska North Slope. Data set. Available on-line [<http://daac.ornl.gov>] from Oak Ridge National Laboratory Distributed Active Archive Center, Oak Ridge, Tennessee, USA. <http://dx.doi.org/10.3334/ORNLDAAC/1265>.
101. **Liu, L.**, K. Schaefer, A. Chen, A. Gusmeroli, E. Jafarov, S. Panda, A. Parsekian, T. Schaefer, H. A. Zebker, T. Zhang. 2015. Pre-ABoVE: Remotely Sensed Active Layer Thickness, Barrow, Alaska, 2006-2011. Data set. Available on-line [<http://daac.ornl.gov>] from Oak Ridge National Laboratory Distributed Active Archive Center, Oak Ridge, Tennessee, USA. <http://dx.doi.org/10.3334/ORNLDAAC/1266>.
102. **Liu, L.**, K. Schaefer, A. Chen, A. Gusmeroli, E. Jafarov, S. Panda, A. Parsekian, T. Schaefer, H. A. Zebker, T. Zhang. 2015. Pre-ABoVE: Remotely Sensed Active Layer Thickness, Prudhoe Bay, Alaska, 1992-2000. Data set. Available on-line [<http://daac.ornl.gov>] from Oak Ridge National Laboratory Distributed Active Archive Center, Oak Ridge, Tennessee, USA. <http://dx.doi.org/10.3334/ORNLDAAC/1267>.

Other Publications (non-peer-reviewed):

103. Feng, W., Xiong, Y., Yi, S., Zhong, B., Chen, X., Zhong, Y., Pan, Y., **Liu, L.**, Wang, W., Zhong, M. (2023), Recent Progress on Hydrogeodesy in China, *Journal of Geodesy and Geoinformation Science*, 6(3), 124–134, doi:10.11947/j.JGGS.2023.0312.
104. Panda, S., K. Schaefer, **Liu, L.**, E. Jafarov, A. Parsekian, A. Chen (2015), Connecting lake area change, ground subsidence and permafrost carbon dynamics in Prudhoe Bay, *Changing Ice: A Newsletter of Cryosphere Research in Alaska*, December 2015.
105. **Liu, L.** (2015) Melting Glaciers in High Asia and their Impacts on Water Sustainability, *CUHK Sustain-*

able Campus, No 10, October 2015.

106. Contributing author to Bartsch et al. (2014) Requirements for Monitoring of Permafrost in Polar Regions: A community white paper in response to the WMO Polar Space Task Group.
107. **Liu, L.**, C. Millar, R. Westfall, and H. Zebker (2013), Taking a Census of California Rock Glaciers from Space, *Mountain Views*, Volume 7, No 2, November 2013.
108. **Liu, L.** (2011), Studying changes in the cryosphere using radar interferometry: permafrost surface subsidence and glacial unloading deformation, *PhD thesis*, University of Colorado.
109. **Liu, L.**, T. Zhang, K. Schaefer, and J. Wahr, InSAR Observations Revealed Surface Subsidence Over Permafrost in Northern Alaska, *Alaska Satellite Facility News and Notes*, 2011 Spring Volume.

Active Research Projects

1. Multi-sensor monitoring, geophysical interpretation and prediction of sea level rise in Hong Kong (Co-PI, Hong Kong Research Grants Council (RGC) Collaborative Research Fund) 2024–
2. Thermokarst Landforms on the Qinghai-Tibet Plateau: Spatio-temporal Evolution and Future Changes (Co-PI, National Natural Science Foundation of China (NSFC)/RGC Joint Research Scheme) 2022–
3. Characterization of ancient lake basins on Mars using advanced topographic modelling and innovative spectroscopic techniques (Co-PI, RGC Collaborative Research Fund) 2022–

Completed Research Projects

1. Deep-learning-based mapping of rock glaciers on the Qinghai-Tibet Plateau (PI, RGC General Research Fund) 2022–2024
2. Rock glacier distribution across the Hindu Kush Himalaya and the French Alps based on remote sensing and deep learning (Co-PI, PROCORE-France/Hong Kong Joint Research Scheme) 2023–2025
3. Hydrological significance of rock glaciers: potential water resources in a warming climate (Co-PI, CUHK–University of Exeter Joint Centre for Environmental Sustainability & Resilience) 2021–2024
4. DeepThaw: Deep-learning-based mapping of thermokarst landforms on the Tibetan Plateau (PI, RGC GRF) 2020–2023
5. GNSS-RECIPE: Global Navigation Satellite System Reflectometry Studies of Elevation Changes in Permafrost Areas (PI, RGC GRF) 2019–2021
6. Kinematics and dynamics of active rock glaciers in western China (PI, RGC GRF) 2018–2021
7. Earth observation to investigate the characteristics and changes of the cryosphere in High Mountain Asia (Co-I, NRSCC/ESA Dragon 4 Programme) 2016–2020
8. Investigation of characteristics and mechanism of earthquakes associated with the Hutubi gas reservoir (Co-I with T-f Wong as PI, NSFC/RGC Joint Research Scheme) 2016–2019
9. Radar remote sensing investigations on thermokarst dynamics on the Qinghai-Tibet Plateau, China (PI, RGC GRF) 2016–2019
10. Mass Balance of Greenland Outlet Glaciers: Non-secular Variations From Space Geodetic Measurements (PI, RGC Early Career Scheme Grant) 2015–2018
11. The combined use of L- and P-band radar to retrieve active layer thickness over Arctic permafrost (PI, CUHK Direct Grant for Research) 2017–2018
12. Synergistic investigations of surface deformation in permafrost areas using field and remote sensing observations (Co-PI, Hong Kong RGC Germany/Hong Kong Joint Research Scheme) 2016–2017
13. Radar Remote Sensing and Field Investigation of Permafrost Changes in Svalbard (PI, CUHK Direct Grant for Research) 2014–2015
14. Remotely-Sensed Active Layer Thickness (ReSALT) product derived from InSAR data over North Amer-

- ican Arctic regions (Co-I, NASA Terrestrial Ecology Program) 2013–2016
15. Collaborative Research: Exploring the Dynamics of the Active Layer and Near-surface Permafrost across the North Slope of Alaska (Co-I, NSF Arctic Natural Science Program) 2012–2015

Research Students Supervised

CUHK Postgraduates

- Joseph H.Y. Ma, *Understanding temporal changes of glacial dynamics with numerical modeling: A case study of Upernavik Isstrøm, Greenland*, MPhil, 2016, PhD at National University of Singapore, now research scientist at Halliburton
- Lingcao Huang, *Mapping non-lake thermokarst landforms on the Tibetan Plateau using remote sensing and deep learning*, PhD, 2019, now Research Assistant Professor at CUHK
- Jie Chen, *Studying permafrost and active layer dynamics in Tibet and Arctic by multi-temporal radar interferometry*, PhD, co-supervised with Hui Lin, 2019, now postdoc at University of Alaska Fairbanks
- Enze Zhang, *Investigating front variations of Greenland glaciers using multi-temporal remote sensing images and deep learning*, PhD, 2020, now postdoc at Hong Kong University of Science and Technology
- Xiyu Chen, *Detecting landscape freeze/thaw onsets and states using active and passive microwave remote sensing data*, PhD, 2021, now at Chongqing Forestry Research Institute
- Yan Hu, *Rock glacier kinematics: A proxy for assessing periglacial dynamics and ground ice content on the Tibetan Plateau*, PhD, 2021, now postdoc at University of Fribourg
- Jiahua Zhang, *Investigating frozen ground dynamics by using Global Navigation Satellite System interferometric reflectometry*, PhD, 2021, now Project Scientist at UCAR
- Billy Ho Ming Tsang, MPhil, 2022, now PhD student at University of Hong Kong
- Xingyu (Carol) Xu, *Investigating Glacial Lakes in the Hindu Kush Karakoram Himalaya Region Using Multi-Source Remote Sensing and Deep Learning*, PhD, 2023, now postdoc at CUHK
- Zhuoxuan (Summer) Xia, PhD, 2020–
- Zhangyu (Joe) Sun, PhD, 2021–
- Jianlong (Herbert) He, PhD, 2022–
- Wensong (Bill) Zhang, PhD, 2023–
- Mengze Li, PhD, 2024–

Postdocs: Bo Hu (2015), Zhiwei Zhou (2016–17), Bao Zhang (2017–18), Guoyan Jiang (2016–19, co-supervised with T-f. Wong), Jiangjun Ran (2018), Lingcao Huang (2020), Yan Hu (2021–24), Xiaofan Zhu (2022), Zhuoyi (Joey) Zhao (2022–23)

Visting Students: Enze Zhang (USTC, 2015), Weiyu Zheng (USTC, 2016), Xiaowen Wang (SWJTU, 2016–17), Wanwan Shao (Lanzhou U, 2016), Zhenming Wu (CAS, 2017), Jiahui Wang (USTC, 2017), Yongxin Liu (Wuhan U, 2017), Yufeng Hu (Wuhan U, 2017–18), Weifan Zhou (Jilin U, 2018), Linyang Xin (Wuhan U, 2019), Yidan Ding (Jilin U, 2019), Haoran Wang (Jilin U, 2019), Chengyan Fan (Lanzhou U, 2021–22)

Services

University, College, and Department Services at CUHK

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|---|--------------|
| Member, Executive committee, Department of Earth and Environmental Sciences | 2022–present |
| Head, Graduate Division of Earth and Atmospheric Sciences | 2020–2025 |
| Member, Search committee of Research Assistant Professor, Dept. of Earth & Environmental Sciences | 2024 |
| Member, Faculty of Science Working Group for Earth & Environmental Sciences Programme | 2021–2022 |
| Chair, Search committee of Ng Yin Ying Assistant Professor, Earth System Science | 2021 |
| Member, Graduate committee, Graduate Division of Earth and Atmospheric Sciences | 2014–2024 |
| Department coordinator, Chung Chi College | 2015–present |
| Institutional representative for CUHK, UNAVCO and WInSAR | 2015–2023 |
| Member, Expert Committee of the Jockey Club Museum of Climate Change | 2019–present |

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| Member, Search committee of assistant and associate professors, Earth System Science Programme | 2018 |
| Member, Review panel of Master of Science in GeoInformation Science | 2017 |
| Member, Lecturer Search committee, Earth System Science Programme | 2015 |
| Library committee, Earth System Science Programme | 2014 |
| Science Advisor | |
| • Eos (AGU’s science news magazine) | 2024–present |
| Editorship | |
| • Member, Editorial Board, <i>Geodesy and Geodynamics</i> | 2022–present |
| • Member, Editorial Board, <i>Journal of Cold Regions Engineering</i> | 2023–present |
| • Guest Editor, <i>Remote Sensing</i> | 2022–23 |
| Member of international committees | |
| • AGU Geodesy Committee | 2024– |
| • AGU Geodesy Awards Committee | 2023–24 |
| • Advisory board for International Permafrost Association Standing Committee for Rock Glacier Inventories and Kinematics Interim Executive Committee | 2023–24 |
| Reviewer for <i>Earth Surface Processes and Landforms</i> , <i>Earth System Science Data</i> , <i>Journal of Geodesy</i> , <i>Journal of Geophysical Research</i> , <i>Geophysical Research Letters</i> , <i>Earth and Planetary Science Letters</i> , <i>Remote Sensing of Environment</i> , <i>The Cryosphere</i> , <i>Geomorphology</i> , <i>Permafrost and Periglacial Processes</i> , <i>ISPRS Journal of Photogrammetry and Remote Sensing</i> , <i>IEEE Transactions on Geoscience and Remote Sensing</i> , <i>IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing</i> , <i>GPS Solutions</i> , <i>Journal of Hydrology</i> , <i>Soil Science Society of America Journal</i> , <i>Pure and Applied Geophysics</i> , <i>Scientific Reports</i> , <i>Frontiers in Earth Science</i> , <i>IPCC’s Special Report on Ocean and Cryosphere in a Changing Climate</i> , US National Science Foundation, Netherlands Space Office, Hong Kong Research Grants Council, etc. | |
| Co-chair or session convener for international conferences | |
| • International Symposium on Polar Sciences – The 40th Anniversary of CHINARE | 2024 |
| • The 1st Chinese Symposium on InSAR | 2024 |
| • International Conference on Earth, Energy and Environmental Sciences for Carbon Neutrality | 2023 |
| • The 2nd EAGE/SEG Workshop on Geophysical Aspects of Smart Cities | 2022 |
| • Recent Advances in SAR Technology for Earth Observation | AGU Meeting 2016 |
| • Scientific Exploration of the Earth with Multi-modal Remote Sensing Mission | AGU Meeting 2015 |
| • Advances in InSAR Data Processing for Earth System Applications | AGU Meeting 2014 |
| • Advances in Geophysical Characterization of Permafrost Systems | AGU Meeting 2013 |
| Scientific committee member for international conferences | |
| • 5th International Workshop on Rock Physics | 2019 |
| • The 2nd international conference of Digital Belt and Road (DBAR 2017) & The 3rd international conference on remote sensing applications in tropical and subtropical areas (RSATSA 2017) | 2017 |
| • The 3rd International Conference on Sensors and Models in Photogrammetry and Remote Sensing | 2015 |
| • The 8th World Chinese Geosciences Congress | 2015 |
| Team member | |
| • Joint work group ‘Geodesy for the Cryosphere: advancing the use of geodetic data in polar climate modelling’, IAG Inter-Commission Committee on Geodesy for Climate Research | 2020–present |
| • International Permafrost Association (IPA) Action Group ‘Retrospective thaw slump inventory and machine learning training-data development’ | 2022–24 |
| • IPA Action Group ‘Rock Glacier Inventories and Kinematics’ | 2018–23 |
| • IPA Action Group ‘Towards a Permafrost Thaw Subsidence Product within the GTN-P database’ | 2018–20 |
| • Vulnerability of Permafrost Carbon Research Coordination Network | 2012–present |
| Member of thesis committee | |
| • Feier Yan, PhD, Hong Kong University of Science and Technology | 2025 |

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| • HO Chung Yan Joanne, MPhil, CUHK (Chair) | 2025 |
| • Junhao Song, PhD, CUHK (Chair) | 2024 |
| • CHU Wai Ching, MPhil, CUHK (Chair) | 2024 |
| • Adnan Barkat, PhD, CUHK (Chair) | 2024 |
| • Jinping Zi, PhD, CUHK (Chair) | 2024 |
| • Zherong Wu, PhD, CUHK | 2024 |
| • LAU Tsz Lam, MPhil, CUHK (Chair) | 2024 |
| • Yiling Zheng, PhD, CUHK (Chair) | 2024 |
| • Tiangang Yuan, PhD, CUHK (Chair) | 2024 |
| • NG Sze In Madeleine, PhD, CUHK (Chair) | 2024 |
| • Cong Liu, PhD, University of Hong Kong | 2023 |
| • Hemraj Bhattarai, PhD, CUHK (Chair) | 2023 |
| • Chenxi Hu, PhD, CUHK (Chair) | 2023 |
| • Dingrui Cao, PhD, CUHK (Chair) | 2023 |
| • Han Chen, PhD, CUHK (Chair) | 2022 |
| • CHOW Tsun Ngai, PhD, CUHK (Chair) | 2022 |
| • Xiaolu Jiang, PhD, CUHK (Chair) | 2022 |
| • Suli Yao, PhD, CUHK (Chair) | 2022 |
| • Rui Zhao, PhD, CUHK (Chair) | 2021 |
| • Xiang Chen, PhD, CUHK (Chair) | 2021 |
| • Yi Luan, PhD, CUHK | 2021 |
| • NG Tsin Hung, MPhil, CUHK (Chair) | 2021 |
| • TAO Ka Chuen, MPhil, CUHK (Chair) | 2021 |
| • TAM Hiu Fai, MPhil, CUHK (Chair) | 2021 |
| • Zhouyi Zhao, PhD, CUHK | 2021 |
| • Wei Lun Alan LIM, PhD, CUHK (Chair) | 2021 |
| • Shihan Sun, PhD, CUHK (Chair) | 2020 |
| • LAM Hoi Ki, MPhil, CUHK (Chair) | 2020 |
| • WONG Yat Chun, MPhil, CUHK (Chair) | 2020 |
| • Xueying Liu, PhD, CUHK (Chair) | 2020 |
| • Pengcheng Zhou, PhD, CUHK | 2020 |
| • Gaohua Zhu, PhD, CUHK | 2020 |
| • Xingfu Li, MPhil, CUHK | 2020 |
| • LEE Hing Bun, Martin, MPhil, CUHK | 2019 |
| • FUNG Ka Ming, PhD, CUHK (Chair) | 2019 |
| • Tanghua Li, PhD, University of Hong Kong | 2018 |
| • Bing He, MPhil, CUHK | 2017 |
| • Xiaowen Wang, PhD, Southwest Jiaotong University | 2017 |
| • Keren Dai, PhD, Southwest Jiaotong University | 2017 |

Other

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| Treasurer, IEEE Geoscience and Remote Sensing Society (GRSS) Hong Kong Chapter | 2022–24 |
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Outreach Activities

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|---|--------------|
| Exhibition on permafrost carbon feedbacks, Jockey Club Museum of Climate Change | 2017–present |
| Discussion panelist, public screening of ‘Ice and the sky’ | 2015 |
| Public talk on the Arctic, cryosphere, and climate change | 2014–present |
| • CUHK Sustainable Development Goals (SDGs) Forum | |
| • Hong Kong Jockey Club Museum of Climate Change | |
| • 13th Lau Oi Wah Memorial Science Lecture Series | |
| • CUHK Knowledge Enrichment Programme for Secondary School Students | |
| Interview with <i>Hong Kong Economic Journal</i> on Greenland and cryospheric studies | 2020 |

Interview with *Radio and Television Hong Kong* on global climate change
Interview with *Headline Daily* on Greenland and sea level change

2014
2014

Last updated: April 5, 2025