

LIN LIU

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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 and Polar Science	Geodesy and Geophysics	Remote Sensing
Planetary Geomorphology	Artificial Intelligence for Earth and Environmental Sciences	

PROFESSIONAL EXPERIENCE

Faculty Member , The Chinese University of Hong Kong (CUHK)	2020–present
<ul style="list-style-type: none">• Associate Professor, Department of Earth and Environmental Sciences, Faculty of Science• Head, Graduate Division of Earth and Environmental 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)	
Invited Professorship , Université Grenoble Alpes	2025
Scientific Team Member , China's 41st Expedition to Antarctica	2024–2025
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 at Boulder	2006–2011

HONORS AND AWARDS (SELECTED)

Invited Professor , Grenoble INP–Université Grenoble Alpes	2025
Distinguished Faculty Stay Award , Department of Geology and Geophysics, University of Utah	2024
Exemplary Teaching Award , Faculty of Science, CUHK	2023
John Wahr Early Career Award , American Geophysical Union	2021
Exemplary Teaching Award , Faculty of Science, CUHK	2016
George Thompson Postdoctoral Fellowship , Department of Geophysics, Stanford University	2011
NASA Earth and Space Science Fellowship , National Aeronautics and Space Administration	2008
CIRES Graduate Research Assistant Fellowship , University of Colorado	2006
First Prize, Outstanding Bachelor's Thesis of Hubei Province	2005
Xia Jianbai Scholarship in Geophysics and Geodesy , Wuhan University	2003

TEACHING EXPERIENCE

Course Instructor , CUHK	
<ul style="list-style-type: none">• Applied Geophysics (ESSC4110 & EASC5110)• Remote Sensing: Principles and Applications (ESSC4540 & EASC5540)• Geomorphology (EESC4130)• Earth System Science (ESGS5001)• Exploring the Earth System (ESSC1000)• Solid Earth Dynamics (ESSC2010)• Geodesy and Gravity (ESSC4601 & EASC5601)• Research Frontiers in Earth and Atmospheric Sciences (EASC5002)• Engineering Geology and Applied Geophysics (co-taught with Teng-fong Wong)• Hydrogeology (ESSC3220, co-taught with Teng-fong Wong)	<div>2017–present</div> <div>2014–present</div> <div>2025</div> <div>2021–present</div> <div>2016–2023</div> <div>2014–2023</div> <div>2020, 2022</div> <div>2014–2020</div> <div>2016</div> <div>2014</div>
Teaching Assistant , Department of Physics, University of Colorado	2005–2006

RESEARCH PROJECTS

Ongoing 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–present
2. **A Comparative Study on the Evolution of Habitability Between Earth and Mars**
Co-Investigator, Ministry of Science and Technology of China–Key Technologies R&D Program 2024–present
3. **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–present
4. **Characterization of ancient lake basins on Mars using advanced topographic modeling and innovative spectroscopic techniques** *Co-PI*, Hong Kong RGC Collaborative Research Fund 2022–present

Completed Projects

1. **Deep-learning-based mapping of rock glaciers on the Qinghai-Tibet Plateau**
PI, RGC General Research Fund (GRF) 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-Investigator, NRSCC/ESA Dragon 4 Programme 2016–2020
8. **Investigation of characteristics and mechanism of earthquakes associated with the Hutubi gas reservoir**
Co-Investigator (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 American Arctic regions** *Co-Investigator*, 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-Investigator*, NSF Arctic Natural Science Program 2012–2015

Annotations: graduate students[×], postdocs[×], undergraduate^{*}, and visiting students[◇]

1. Xu, X.[×], **Liu, L.**, Huang, L., Hu, Y.[×], Zhang, G., Racoviteanu, A., Liu, E., and Chan, Y. (2025), Contrasting short-term dynamics of supraglacial ponds along the Hindu Kush-Himalaya revealed by PlanetScope imagery and deep learning, *Global and Planetary Change*, 253, 104949, <https://doi.org/10.1016/j.gloplacha.2025.104949>.
2. Chen, M.[◇], Xu, G., and **Liu, L.** (2025), Estimation of 3D complex deformation of surface-rupture earthquake with automated fault trace identification, *IEEE Transactions on Geoscience and Remote Sensing*, 63, 5213013, <https://doi.org/10.1109/TGRS.2025.3573809>.
3. 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>.
4. Fan, C.[◇], **Liu, L.**, Zhao, Z.[×], and 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>.
5. Fan, C.[◇], Mu, C., **Liu, L.**, Zhang, T., Jia, S., Wang, S., Sun, W., and 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>.
6. 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>.
7. Zhang, Z., Jin, Q., **Liu, L.**, Wang, M., and 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>.
8. 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>.
9. 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>.
10. 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>.
11. 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, <https://doi.org/10.1016/j.accre.2024.11.003>.
12. 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>.
13. 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>.
14. Zwieback, S., **Liu, L.**, Rouyet, L., Short, N., and Strozzi, T. (2024), Advances in InSAR analysis of permafrost terrain, *Permafrost and Periglacial Processes*, 35, 544–556, <https://doi.org/10.1002/ppp.2248>.

15. 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>.
16. 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>.
17. 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>.
18. 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>.
19. 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>.
20. 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>.
21. 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>. 🏆 **Highly-cited Paper**
22. 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>.
23. 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>.
24. 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>.
25. 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*, 823, 153770, <https://doi.org/10.1016/j.scitotenv.2022.153770>.
26. 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>.
27. 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>.
28. 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>.
29. 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>.

30. 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>.
31. 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>.
32. 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>.
33. 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>.
34. 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>.
35. 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>.
36. 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>.
37. 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>.
38. 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>.
39. 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>.
40. Liu, W., Chen, X., Ran, J., **Liu, L.**, Wang, Q., Xin, L., and 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>.
41. 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>.
42. Khan, S. A., Bjørk, A., Bamber, J., Morlighem, M., Bevis, M., Kjær, K., Mouginot, J., Løkkegaard, A., Holland, D., Aschwanden, A., Zhang, B., Helm, V., Korsgaard, N., Colgan, W., Larsen, N., **Liu, L.**, Hansen, K., Barletta, V., Dahl-Jensen, T., Søndergaard, A., 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>.
43. 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>.
44. 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>.

45. 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>.
46. 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>.
47. 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>.
48. Zhang, E., **Liu, L.**, and Huang, L. (2019), Automatically delineating the calving front of Jakobshavn Isbræ from multitemporal TerraSAR-X images: a deep learning approach, *The Cryosphere*, 13, 1729–1741, <https://doi.org/10.5194/tc-2019-14>.
49. 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>.
50. Zhang, B.[×], **Liu, L.**, Khan, S.A., van Dam, T., Björk, A.A., Peings, Y., Zhang, E., Bevis, M., Yao, Y., and Noël, B. (2019), Geodetic and model data reveal different spatio-temporal patterns of transient mass changes over Greenland from 2007 to 2017, *Earth and Planetary Science Letters*, 515, 154–163, <https://doi.org/10.1016/j.epsl.2019.03.028>.
51. Chen, X., **Liu, L.**, and Bartsch, A. (2019), Detecting soil freeze/thaw onsets in Alaska using SMAP and ASCAT data, *Remote Sensing of Environment*, 220, 59–70, <https://doi.org/10.1016/j.rse.2018.10.010>.
52. Wang, S., Xu, W., Xu, C., Yin, Z., Bürgmann, R., **Liu, L.**, and Jiang, G.[×] (2019), Changes in groundwater level possibly encourage shallow earthquakes in central Australia: The 2016 Petermann Ranges earthquake, *Geophysical Research Letters*, 46, 3189–3198, <https://doi.org/10.1029/2018GL080510>.
53. Michaelides, R. J., Schaefer, K., Zebker, H.A., Parsekian, A., **Liu, L.**, Chen, J., Natali, S., Ludwig, S., and Schaefer, S.R. (2019), Inference of the impact of wildfire on permafrost and active layer thickness in a discontinuous permafrost region using the remotely sensed active layer thickness (ReSALT) algorithm, *Environmental Research Letters*, 14(3), 035007, <https://doi.org/10.1088/1748-9326/aaf932>.
54. Huang, L., **Liu, L.**, Zhang, T., and Jiang, L. (2018), Automatic mapping of thermokarst landforms from remote sensing images using deep learning: A case study in the Northeastern Tibetan Plateau, *Remote Sensing*, 10(12), 2067, <https://doi.org/10.3390/rs10122067>.
55. Chen, J., **Liu, L.**, Zhang, T., Cao, B., and Lin, H. (2018), Using Persistent Scatterer Interferometry to map and quantify permafrost thaw subsidence: a case study of Eboiling Mountain on the Qinghai-Tibet Plateau, *Journal of Geophysical Research: Earth Surface*, 123, 2663–2676, <https://doi.org/10.1029/2018JF004618>.
56. Chen, J., Günther, F., Grosse, G., **Liu, L.**, and Lin, H. (2018), Sentinel-1 InSAR measurements of elevation changes over Yedoma uplands on Sobo-Sise Island, Lena Delta, *Remote Sensing*, 10(7), 1152, <https://doi.org/10.3390/rs10071152>.
57. 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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62. Wu, Z.[◇], Zhao, L., Liu, L., Zhu, R., Gao, Z., Qiao, Y., Tian, L., Zhou, H., and Xie, M. (2018), Surface deformation monitoring in the permafrost regions over Tibetan Plateau using Sentinel-1 data, *Sciences in Cold and Arid Regions*, 10(2), 114–125, <https://doi.org/10.3724/SP.J.1226.2018.00114>.
63. Jafarov E. E., Parsekian, A., Schaefer, K., Liu, L., Chen, A.C., Panda, S.K., and Zhang, T. (2018), Estimating active layer thickness and volumetric water content from ground penetrating radar measurements in Barrow, Alaska, *Geoscience Data Journal*, 4, 72–79, <https://doi.org/10.1002/gdj3.49>.
64. Zhang, B.[×], Liu, L., Khan, S. A., van Dam, T., Zhang, E., and Yao, Y. (2017), Transient variations in glacial mass near Upernavik Isstrøm (west Greenland) detected by the combined use of GPS and GRACE data, *Journal of Geophysical Research: Solid Earth*, 122, 10626–10642, <https://doi.org/10.1002/2017JB014529>.
65. Liu, L., Khan, S. A., van Dam, T., Ma, J. H. Y., and Bevis, M. (2017), Annual variations in GPS-measured vertical displacements near Upernavik Isstrøm (Greenland) and contributions from surface mass loading, *Journal of Geophysical Research: Solid Earth*, 122, 677–691, <https://doi.org/10.1002/2016JB013494>.
66. Wang, X.[◇], Liu, L., Zhao, L., Wu, T., Li, Z., and Liu, G., (2017), Mapping and inventorying active rock glaciers in the northern Tien Shan of China using satellite SAR interferometry, *The Cryosphere*, 11, 997–1014, <https://doi.org/10.5194/tc-11-997-2017>.
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87. **Liu, L.** (2021), A review of deep learning for cryospheric studies, in *Deep Learning for the Earth Sciences*, G. Camps-Valls, D. Tuia, X. Zhu, and M. Reichstein, Eds., Wiley & Sons. <https://doi.org/10.1002/9781119646181.ch17>.

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88. Sun, Z., **Liu, L.**, Fan, C., Hu, Y.[×], Baldacchino, F., Bhattacharya, A., Wood, E., and Bolch, T., Unveiling large-scale velocity characteristics of rock glaciers in the Tibet-Pamir-Karakoram region using a streamlined InSAR framework, submitted to *International Journal of Applied Earth Observation and Geoinformation*.
89. Maier, K., Xia, Z., **Liu, L.**, Lara, M., van der Sluijs, J., Bernhard, P., and Hajnsek, I., Quantifying Retrogressive Thaw Slump Mass Wasting and Carbon Mobilisation on the Qinghai-Tibet Plateau Using Multi-Modal Remote Sensing, *The Cryosphere Discussion*, <https://doi.org/10.5194/egusphere-2025-2187>.
90. Mu, C., Du, X., Zhang, C., Jia, Y., Wei, Y., Song, J., Mu, M., Peng, X., **Liu, L.**, Xia, Z., Huang, L., Zhang, P., Liu, R., Wangchuk, S., Hjort, J., and Zhang, X., Permafrost thaw threatens infrastructure and sustainable development of mountain regions, submitted to *Nature Cities*.

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93. 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>.
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99. 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>.
100. 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>.
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102. 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/ORNLDAAAC/1676>.
103. 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>.
104. 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>.
105. 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/ORNLDAAAC/1355>.
106. 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. ORNL DAAC, Oak Ridge, Tennessee, USA. <http://dx.doi.org/10.3334/ORNLDAAAC/1265>.
107. 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. ORNL DAAC, Oak Ridge, Tennessee, USA. <http://dx.doi.org/10.3334/ORNLDAAAC/1266>.

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Other Publications (non-peer-reviewed)

109. Feng, W., Xiong, Y., Yi, S., Zhong, B., Chen, X., Zhong, Y., Pan, Y., **Liu, L.**, Wang, W., and Zhong, M. (2023), Recent Progress on Hydrogeodesy in China, *Journal of Geodesy and Geoinformation Science*, 6(3), 124–134, <https://doi.org/10.11947/j.JGGS.2023.0312>.
110. Panda, S., K. Schaefer, **Liu, L.**, E. Jafarov, A. Parsekian, and 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.
111. **Liu, L.** (2015) Melting Glaciers in High Asia and their Impacts on Water Sustainability, *CUHK Sustainable Campus*, No 10, October 2015.
112. 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.
113. **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.
114. **Liu, L.** (2011), Studying changes in the cryosphere using radar interferometry: permafrost surface subsidence and glacial unloading deformation, *PhD thesis*, University of Colorado.
115. **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.

RECENT INVITED TALKS

• Tracking Greenland meltwater storage through mass loading deformation, ISTerre	2024
• Monitoring permafrost degradation using InSAR, Southern University of Science and Technology	2025
• Deep learning for Cryospheric Studies, Lanzhou University of Technology	2025
• Tracking Greenland's meltwater storage through mass loading deformation, Wuhan University	2025
• Monitoring permafrost degradation using space geodesy, China University of Geosciences (Wuhan)	2025
• Spatial-temporal evolution of thaw slumps on the Qinghai-Tibetan Plateau, Innovation Academy for Precision Measurement Science and Technology, Chinese Academy of Sciences	2025
• Investigating frozen ground dynamics using GNSS Interferometric Reflectometry, GNSS-IR Webinar Series	2025
• GNSS for Ice: Tracking Greenland's meltwater storage through mass loading deformation, University of Utah	2024
• Geodetic studies of frozen ground, Michigan State University	2024
• Geophysical investigations of thawing permafrost, University of Utah	2024
• Geodesy for permafrost Essential Climate Variable, Sun Yat-sen University	2024
• Remote sensing of frozen ground, University of Hong Kong	2023
• Deep learning for Cryospheric Studies, Lanzhou University	2023
• Environmental, socioeconomic, and health risks of thawing permafrost in Tibet, Tongji University	2023
• Geophysical investigations of thawing permafrost, University of Texas at Austin	2022
• Geodetic and remote sensing observations of thawing permafrost, Hong Kong Polytechnic University	2022
• Geodetic studies of frozen ground, Peking University	2022
• Deep learning for earth sciences, Geological Society of London Hong Kong Regional Group	2021

- *Geodetic studies of frozen ground*, AGU Geodesy webinar 2021
- *AI for Cryosphere*, University of Science and Technology of China 2021

RESEARCH STUDENTS SUPERVISED

CUHK Postgraduates

- **Joseph H.Y. Ma** MPhil, 2016
Understanding temporal changes of glacial dynamics with numerical modeling: A case study of Upernavik Isstrøm, Greenland
After CUHK: PhD at National University of Singapore, Now: Research Scientist at Halliburton
- **Lingcao Huang** PhD, 2019
Mapping non-lake thermokarst landforms on the Tibetan Plateau using remote sensing and deep learning
Now: Research Assistant Professor at CUHK
- **Jie Chen** PhD, 2019
Studying permafrost and active layer dynamics in Tibet and Arctic by multi-temporal radar interferometry
Now: Postdoc at University of Alaska Fairbanks
- **Enze Zhang** PhD, 2020
Investigating front variations of Greenland glaciers using multi-temporal remote sensing images & deep learning
Now: Postdoc at Hong Kong University of Science and Technology
- **Xiyu Chen** PhD, 2021
Detecting landscape freeze/thaw onsets and states using active and passive microwave remote sensing data
Now: Chongqing Forestry Research Institute
- **Yan Hu** PhD, 2021
Rock glacier kinematics: A proxy for assessing periglacial dynamics & ground ice content on the Tibetan Plateau
Now: Postdoc at University of Fribourg
- **Jiahua Zhang** PhD, 2021
Investigating frozen ground dynamics by using Global Navigation Satellite System interferometric reflectometry
Now: Project Scientist at University Corporation for Atmospheric Research (UCAR)
- **Billy Ho Ming Tsang** MPhil, 2022
Landslide mapping from remote sensing images using deep learning: a case study in Lantau Island, Hong Kong
Now: PhD student at University of Hong Kong
- **Xingyu (Carol) Xu** PhD, 2023
Investigating Glacial Lakes in the Hindu Kush Karakoram Himalaya Region Using Multi-Source Remote Sensing & Deep Learning
Now: Postdoc at Wuhan University
- **Zhuoxuan (Summer) Xia** PhD, 2025
Investigating the spatial distribution, dynamics, & vegetation recovery of retrogressive thaw slumps on the Qinghai-Tibetan Plateau
- **Zhangyu (Joe) Sun** PhD, 2025
A Comprehensive Study of Rock Glacier Distribution, Velocities, & Water Storage in High Mountain Asia
- **Jianlong (Herbert) He** PhD, 2022–present
- **Wensong (Bill) Zhang** PhD, 2023–present
- **Mengze Li** PhD, 2024–present
- **Luming (Louis) Yang** PhD, 2025–present
- **Yifan Bu** PhD, 2025–present

- **Wei Wu** PhD, 2025–present

Postdoctoral Fellows: Bo Hu (2015), Zhiwei Zhou (2016–2017), Bao Zhang (2017–2018), Guoyan Jiang (2016–2019, co-supervised with T-f. Wong), Jiangjun Ran (2018), Lingcao Huang (2020), Yan Hu (2021–2024), Xiaofan Zhu (2022), Zhuoyi (Joey) Zhao (2022–2023), Xingyu Xu (2023–2025)

Visting Students: Enze Zhang (USTC, 2015), Weiyu Zheng (USTC, 2016), Xiaowen Wang (SWJTU, 2016–2017), Wanwan Shao (Lanzhou U, 2016), Zhenming Wu (CAS, 2017), Jiahui Wang (USTC, 2017), Yongxin Liu (Wuhan U, 2017), Yufeng Hu (Wuhan U, 2017–2018), Weifan Zhou (Jilin U, 2018), Linyang Xin (Wuhan U, 2019), Yidan Ding (Jilin U, 2019), Haoran Wang (Jilin U, 2019), Chengyan Fan (Lanzhou U, 2021–2022)

Stanford SURGE 2012: Elena Baluyut (Saint Louis U), Manuel Pichardo (Utah State U), Chris Cumberbatch (Morehouse College)

SERVICE

University, College, and Department Services at CUHK

- Member, Executive committee, Department of Earth and Environmental Sciences 2022–present
- Head, Graduate Division of Earth and Environmental Sciences 2020–present
- Department coordinator, Chung Chi College 2015–present
- Member, Expert Committee of the Jockey Club Museum of Climate Change 2019–present
- 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 Programme 2021
- Member, Graduate committee, Graduate Division of Earth and Atmospheric Sciences 2014–2024
- Institutional representative, UNAVCO and WInSAR 2015–2023
- 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

Editorship

- Science Advisor, *Eos* (AGU's science news magazine) 2024–present
- Member, Editorial Board, *Geodesy and Geodynamics* 2022–present
- Member, Editorial Board, *Journal of Cold Regions Engineering* 2023–present
- Guest Editor, *Remote Sensing* 2022–2023

Member of International Committees or Groups

- AGU Geodesy Committee 2024–present
- AGU Geodesy Awards Committee 2023–present
- Advisory board, International Permafrost Association (IPA) Standing Committee for Rock Glacier Inventories and Kinematics Executive Committee 2023–present
- 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
- Director for Students, IEEE Geoscience and Remote Sensing Society (GRSS) Hong Kong Chapter 2024–present
- Treasurer, IEEE GRSS Hong Kong Chapter 2022–2024
- Vulnerability of Permafrost Carbon Research Coordination Network 2012–present
- IPA Action Group 'Retrospective thaw slump inventory' 2022–2024
- IPA Action Group 'Rock Glacier Inventories and Kinematics' 2018–2023
- IPA Action Group 'Towards a Permafrost Thaw Subsidence Product within the GTN-P database' 2018–2020

Reviewer: *Earth and Planetary Science Letters*, *Earth Surface Processes and Landforms*, *Earth System Science Data*, *Frontiers in Earth Science*, *Geomorphology*, *Geophysical Research Letters*, *GPS Solutions*, *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, *IEEE Transactions on Geoscience and Remote Sensing*, *ISPRS Journal of Photogrammetry and Remote Sensing*, *Journal of Geodesy*, *Journal of Geophysical Research*, *Journal of Hydrology*, *Permafrost and Periglacial Processes*, *Pure and Applied Geophysics*, *Remote Sensing of Environment*, *Scientific Reports*, *Soil Science Society of America Journal*, *The Cryosphere*.

IPCC's Special Report on Ocean and Cryosphere in a Changing Climate, US National Science Foundation, Netherlands Space Office, Hong Kong Research Grants Council, etc.

Conference Chair or Session Convener

- International Symposium on Polar Sciences – The 40th Anniversary of CHINARE 2024
- 1st Chinese Symposium on InSAR 2024
- Co-Chair, International Conference on Earth, Energy and Environmental Sciences for Carbon Neutrality 2023
- Co-Chair, The 2nd EAGE/SEG Workshop on Geophysical Aspects of Smart Cities 2022
- 5th International Workshop on Rock Physics 2019
- 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
- 3rd International Conference on Sensors and Models in Photogrammetry and Remote Sensing 2015
- 8th World Chinese Geosciences Congress 2015
- 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

Member of Thesis Committee

2025

Donger Lai, PhD, CUHK (Chair)
Feier Yan, PhD, HKUST
HO Chung Yan Joanne, MPhil, CUHK (Chair)
LAW Chak Hay Hayden, MPhil, CUHK (Chair)
Yukai Hu, MPhil, CUHK (Chair)
Zilin Song, PhD, CUHK (Chair)

2023

Chenxi Hu, PhD, CUHK (Chair)
Cong Liu, PhD, University of Hong Kong
Dingrui Cao, PhD, CUHK (Chair)
Hemraj Bhattarai, PhD, CUHK (Chair)

2021

NG Tsin Hung, MPhil, CUHK (Chair)
Rui Zhao, PhD, CUHK (Chair)
TAO Ka Chuen, MPhil, CUHK (Chair)
TAM Hiu Fai, MPhil, CUHK (Chair)
Wei Lun Alan LIM, PhD, CUHK (Chair)
Xiang Chen, PhD, CUHK (Chair)
Yi Luan, PhD, CUHK
Zhouyi Zhao, PhD, CUHK

2019

FUNG Ka Ming, PhD, CUHK (Chair)
LEE Hing Bun, Martin, MPhil, CUHK

2024

Adnan Barkat, PhD, CUHK (Chair)
CHU Wai Ching, MPhil, CUHK (Chair)
Jinping Zi, PhD, CUHK (Chair)
Junhao Song, PhD, CUHK (Chair)
LAU Tsz Lam, MPhil, CUHK (Chair)
NG Sze In Madeleine, PhD, CUHK (Chair)
Tiangang Yuan, PhD, CUHK (Chair)
Yiling Zheng, PhD, CUHK (Chair)
Zherong Wu, PhD, CUHK

2022

CHOW Tsun Ngai, PhD, CUHK (Chair)
Han Chen, PhD, CUHK (Chair)
Suli Yao, PhD, CUHK (Chair)
Xiaolu Jiang, PhD, CUHK (Chair)

2020

Gaohua Zhu, PhD, CUHK
LAM Hoi Ki, MPhil, CUHK (Chair)
Pengcheng Zhou, PhD, CUHK
Shihan Sun, PhD, CUHK (Chair)
WONG Yat Chun, MPhil, CUHK (Chair)
Xingfu Li, MPhil, CUHK
Xueying Liu, PhD, CUHK (Chair)

2018–2017

Bing He, MPhil, CUHK (2017)
Keren Dai, PhD, Southwest Jiaotong University (2017)
Tanghua Li, PhD, University of Hong Kong (2018)
Xiaowen Wang, PhD, Southwest Jiaotong University (2017)

Outreach

- Interviews with local and national media on polar studies: *Headline Daily*, *Hong Kong Economic Journal*,

Radio and Television Hong Kong, Wen Wei Po

2014–present

- Public talks on polar sciences and climate change

2014–present

Malvern College Hong Kong

Hong Kong Regional Group of The Geological Society London

Geological Society of Hong Kong

CUHK Sustainable Development Goals Forum

Hong Kong Jockey Club Museum of Climate Change

13th Lau Oi Wah Memorial Science Lecture Series, CUHK

CUHK Knowledge Enrichment Programme for Secondary School Students

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