

Major research focus areas 主要研究領域

1. Land Reclamation 填海

The key objective of the research theme is to develop cutting edge concepts and technologies for land reclamation. The main research topics include innovative methods for fast land reclamation, new materials and structures for land reclamation, use of construction wastes in land reclamation, cost and economic returns of land reclamation, hydrological challenges, e.g., coastal circulations, environmental impacts and mitigation, water quality modification in coastal areas due to land reclamation, and management of reclaimed land, e.g., land settlement.

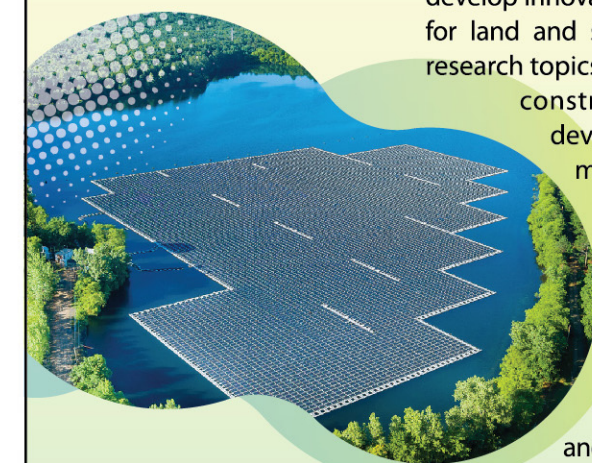
主要目標是研發填海的最前沿概念和技術。主要研究方向包括快速填海的創新方法、填海新材料和結構、利用建築廢物填海、填海的成本和經濟回報、水文相關的範疇包括海岸環流、填海對環境的影響和緩解措施及填海沿岸水質管理，以及填海所得土地的管理，例如土地沉降。



2. Innovative Land and Space Solutions 土地和空間發展創新方案

The key objective of the research theme is to develop innovative concepts and technologies for land and space development. The main research topics include innovative design and construction of floating structures, development of high-performance materials and innovative structural systems for floating structures, wave-structure-soil interaction analysis, innovative methods for creation and use of rock caverns, underground space and multi-layered urban space, utilization of brownfield sites, and ocean modelling and sediment transport analysis.

主要目標是研發土地和空間發展的創新概念和技術。主要研究方向包括浮動結構體的創新設計和建造、浮動結構體的高性能材料和創新結構系統、海浪-結構-土壤相互作用分析、岩洞、地下空間和多層城市空間的開發和使用、棕地使用、海洋建模，以及沉積物運輸分析。



3. Environmental Treatment and Impacts 環境處理和影響

The key objective of the research theme is to cover the broad topics of environmental changes and pollution associated with land and space developments, including the types and sources of pollution and ecological changes, impacts of environmental changes on human life and ecosystems, treatments of pollution and contamination, and optimization of land and space developments with positive environmental impacts.

主要目標是研究涵蓋土地和空間發展所引致的環境變化和污染，包括污染和生態變化的種類和源頭、環境變化對人類生活和生態系統的影響、污染處理，以及具環保效益的土地和空間發展。



4. Land Economics and Planning 土地經濟和規劃

The key objective of the research theme is to study the costs and economic returns, and societal impacts of land and space development in Hong Kong, the Greater Bay Area and beyond. The main research topics will include economic and societal impacts of land shortage and development, forecast of future land demand, costs associated with different development options, and optimization of land and space development based on land economics.

主要目標是探討香港、大灣區及其他地區的土地和空間發展成本和經濟效益及對社會的影響。主要研究方向包括土地短缺及發展帶來的經濟和社會影響、未來土地需求預測、不同發展方案的成本，以及基於土地經濟原則的土地和空間發展。



5. Land Analytics and Management 土地分析和管理的創新技術

The key objective of the research theme is to develop innovative new technologies for land analytics and management. The main research topics include developing techniques for collecting highly detailed land use, land cover, and land legal information, methods for detecting changes in the information, study of land settlement and landslides, safety of rock caverns and underground space, and analyzing land and space development options based on multivariate optimization.

主要目標是研發土地分析和管理的創新技術，包括收集土地的使用、覆蓋和法律信息等詳細資料的技術、檢測資料變化的方法、土地沉降和山泥傾瀉研究、岩洞和地下空間的安全，以及運用多元優化法分析土地和空間發展方案。



Opportunities in RILS 把握機遇

Collaboration

The Research Institute welcomes opportunities of collaboration with other researchers and the industry in Hong Kong and beyond in development and optimal use of land and space.

PhD Studentship

RILS provides excellent opportunities for outstanding students to pursue PhD research in fields related to major research focuses. Please contact the RILS members for further information.

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Research Institute for Land and Space 土地及空間研究院



Message from Director 院長的話



Research Institute for Land and Space (RILS) was established by The Hong Kong Polytechnic University (PolyU) in May 2021 to carry out research into major issues surrounding land and space development in Hong Kong, the Greater Bay Area and beyond.

It is well-known that there is a shortage of land and space for accommodation and economic development in many parts of the world, especially in the densely populated Asian cities like Hong Kong. The above has resulted in very poor living conditions for a large proportion of the population, affecting the wellbeing of the under privileged both physically and psychologically. It has also limited a lot of industrial, educational, and economic activities. To create more land and space economically and environmentally friendly and to optimize the use of existing resources are keys for long-term sustainable development of many cities in the world.

A strong multi-disciplinary research team has been formed under the RILS with the over 30 team members coming from about ten academic departments of the University. We aim to become a world leader in developing innovative solutions for creating economical and environmentally friendly land and space. In addition, we would like to work closely with the industry, especially relevant government departments, local and international consulting firms, and researchers around the world.

Prof. Xiaoli Ding 丁曉利 教授
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The Hong Kong Polytechnic University 香港理工大學

香港理工大學（理大）於二零二一年五月成立了土地及空間研究院，旨在研究香港、粵港澳大灣區及其他地區的土地和空間發展議題。

眾所周知，全球很多地方均缺乏用作住屋和經濟發展的土地和空間，特別是像香港這樣人口密集的亞洲城市。以上情況除了導致很多人生活在惡劣的居住環境，影響弱勢群體的身心健康，亦限制了不少工業、教育和經濟活動。因此，善用現有的資源，並運用符合經濟和環保效益的方法創造新的土地和空間，是很多城市達致長期可持續發展的關鍵。

土地及空間研究院擁有一支三十多名來自多個學系的理大學者組成的跨學科研究團隊，共同探討兼具經濟及環保效益的土地和空間發展方案，銳意成為這一領域的全球典範。此外，我們熱切期待與業界、相關政府部門、本地與國際顧問公司，以及世界各地的研究人員緊密合作。

Vision and mission 願景和使命

Vision

To be a world leader in creating innovative solutions for developing affordable and environmentally friendly land and space.

Mission

1. To optimize land and space development strategies for dense cities like Hong Kong through cutting edge, multi-disciplinary and collaborative research;
2. To transfer knowledge from the research by collaborating closely with industry and governments; and
3. To make lasting positive impacts on the long-term development of Hong Kong and many similar cities in the world by helping shape the future land supply strategies.

PolyU's strengths and expertise in the area 理大的優勢和專長

A strong multi-disciplinary team consisting of over 30 core members has been formed. The expertise of the members covers well all the key disciplines related to land and space research, including land surveying, land economics, land law, planning, environment, soil and sediment contamination, marine biology, ecotoxicology, aquaculture, aquatic toxicology, structural engineering, geotechnical engineering, hydraulics, remote sensing, geographical information system, and public policy. The research team has a strong track record of securing external research grants. For example, the members have received as PI or Co-PI 43 major external research grants (each equal to or larger than HK\$2M) in total. The RILS should help accelerate the momentum of winning major external research grants.

The Research Institute has already established strong collaborations with researchers around the world. A sample of the current academic collaborators includes Harvard University, Massachusetts Institute of Technology, New York University, Northwestern University, KTH Royal Institute of Technology, Singapore-MIT Alliance for Research and Technology, Stanford University, Université de Toulon, University of California, Berkeley, University of California, Irvine, University of Cambridge, University of Genova, University of Tokyo, University of Toronto, and Yonsei University. Moreover, the team is also cooperating well with relevant Hong Kong government departments and industrial partners.

願景

成為提供經濟及環保的土地與空間開發方案的世界級研究院。

使命

1. 通過開展前沿、多學科和協作研究，優化類似香港這樣的人口密集城市的土地和空間發展策略；
2. 與業界和政府緊密合作，實踐知識轉移；及
3. 協助制定未來土地供應策略，為香港和其他類似城市的長遠發展帶來持續的正面影響。



理大土地及空間研究院擁有一支由三十多名核心成員組成的跨學科研究團隊。成員的專長涵蓋土地和空間研究的所有重點學科，包括土地測量、土地經濟學、土地法、規劃、環境、土壤和沉積物污染、海洋生物學、生態毒理學、水產養殖、水生毒理學、結構工程、土力工程、水力學、遙感、地理信息系統和公共政策。團隊屢獲校外研究資助，過去由團隊成員擔任首席研究員或共同首席研究員的大型項目（每項資助不少於港幣二百萬元），已有四十餘項主要研究資助。

本院與世界各地的研究人員建立了強大的合作網絡。目前的學界合作夥伴包括哈佛大學、麻省理工學院、紐約大學、西北大學、瑞典皇家理工學院、新加坡-麻省理工學院聯盟科研中心、史丹福大學、土倫大學、加州大學柏克萊分校、加州大學爾灣分校、劍橋大學、熱那亞大學、東京大學、多倫多大學和延世大學。此外，研究團隊更與本港相關政府部門和業界維持良好的合作關係。

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