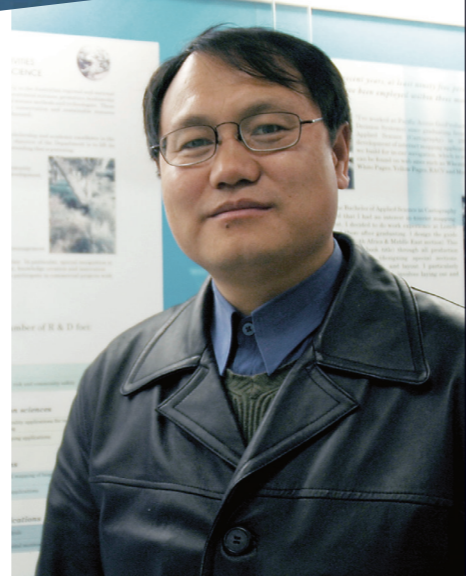


# INTERNATIONAL SPACE TECHNOLOGY CONSORTIUM



“ We expect it will lead to a significant global competitive advantage for Australian companies involved in the use of advanced space technologies for positioning, tracking and environmental monitoring. ”

Professor Kefei Zhang,  
RMIT University School of Mathematical and Geospatial Sciences  
and Director of the Centre of Surveying, Positioning and Navigation



An RMIT-led research team has received significant funding from the Australian Government in support of a new \$7 million international space technology consortium.

A grant of \$2.85 million from the Australian Space Research Program, in addition to funding from partner organisations, will allow a team of national and international researchers to develop advanced platform technologies for space, atmosphere and climate research.

Professor Kefei Zhang of RMIT's School of Mathematical and Geospatial Sciences, who is also Director of the Centre of Surveying, Positioning and Navigation, is leading the expert team (listed below right).

The 'Platform Technologies for Space, Atmosphere and Climate' project will develop a suite of satellite-based technology platforms for the purposes of in-space tracking and navigation, precise positioning, space weather, atmospheric modelling and climate monitoring.

Professor Zhang said: "This is a significant step forward to position us into the space-related future. The consortium brings together key researchers to address important and challenging scientific and technical issues."

Real-time orbit determination, precise satellite positioning and atmospheric studies are critical for space situational awareness, as well as for the maintenance and operation of satellites. This research will make a major contribution to the space industry in efficient and effective space tracking, PNT (positioning, navigation and timing), debris surveillance and collision avoidance, and in the design, launch and operation of future Australian micro and nano satellite missions.

"We are intending to develop new algorithms and enhanced atmospheric models in the context of the latest Global Satellite Navigation Systems (GNSS), which will enhance Australia's capability in space research and meteorology," Professor Zhang said.

"For example, we aim to achieve an order of magnitude improvement in atmospheric mass density modelling, which will lead to a significant breakthrough in space tracking and orbit prediction."

Climate change and hazards such as tropical cyclones, drought, extreme heat and bushfires are serious problems faced by Australia. The insufficient density of ground-based meteorological observation stations – particularly in the Southern Hemisphere – and the lack of accurate data over the world's oceans and polar regions, significantly limits the accuracy and reliability of the current climate models. There is a need for new observational techniques to be developed and evaluated to gain an improved understanding of climate change in the Australian region.

Satellite-based remote sensing provides a low-cost, powerful means of precise measurement of characteristics of the earth environment on a global scale. This project will explore the acquisition, data processing and models that the new-generation GNSS and geo-environmental satellite programs offer for space, atmosphere and climate research, particularly in the Australian context.

Success of this research will put Australia in a leading position world-wide in the study of atmospheric mass density and innovative applications of satellite technologies in PNT, climate and space weather.

"Geo-environmental satellite programs such as the Constellation Observing System for Meteorology, Ionosphere and Climate (COSMIC) will allow high-accuracy monitoring of climatic hazards," Professor Zhang said. "This will represent a vital step in improving understanding of the impact of climate change on Australia."

"The platforms developed will enhance our capacity and play a critical role in supporting the Australian space industry for technological innovation and future Australian satellite missions."

"We expect it will lead to a significant global competitive advantage for Australian companies involved in the use of advanced space technologies for positioning, tracking and environmental monitoring."

The project is being funded as part of the Federal Government's Super Science Initiative with the goal of promoting new opportunities, linkages and investment in Australian space science and innovation.

Innovation Minister Senator Kim Carr said: "The projects we are funding will promote new opportunities and investment in Australian space science."

"Australia can be a serious player in the global space industry if we focus on niche areas that match our special capabilities. That is what these projects do."

## AN EXPERT TEAM

The key collaborators in the 'Platform Technologies for Space, Atmosphere and Climate' project include:

- » Professor Kefei Zhang, Dr Robert Norman and Dr Chuan-sheng Wang, RMIT University
- » Professor Peter Teunissen, Curtin University of Technology
- » Professor Chris Rizos, University of NSW
- » Professor John Le Marshall and Professor Yuriy Kuleshov, Bureau of Meteorology
- » Dr Jizhang Sang and Dr Craig Smith, Electro Optic Systems
- » Mr Graeme Hooper, GPSat Systems Australia
- » Professor Yuei-an Liou, National Central University, Taiwan

In conjunction with:

- » World Data Centre for Meteorology
- » Taiwan National Space Organisation