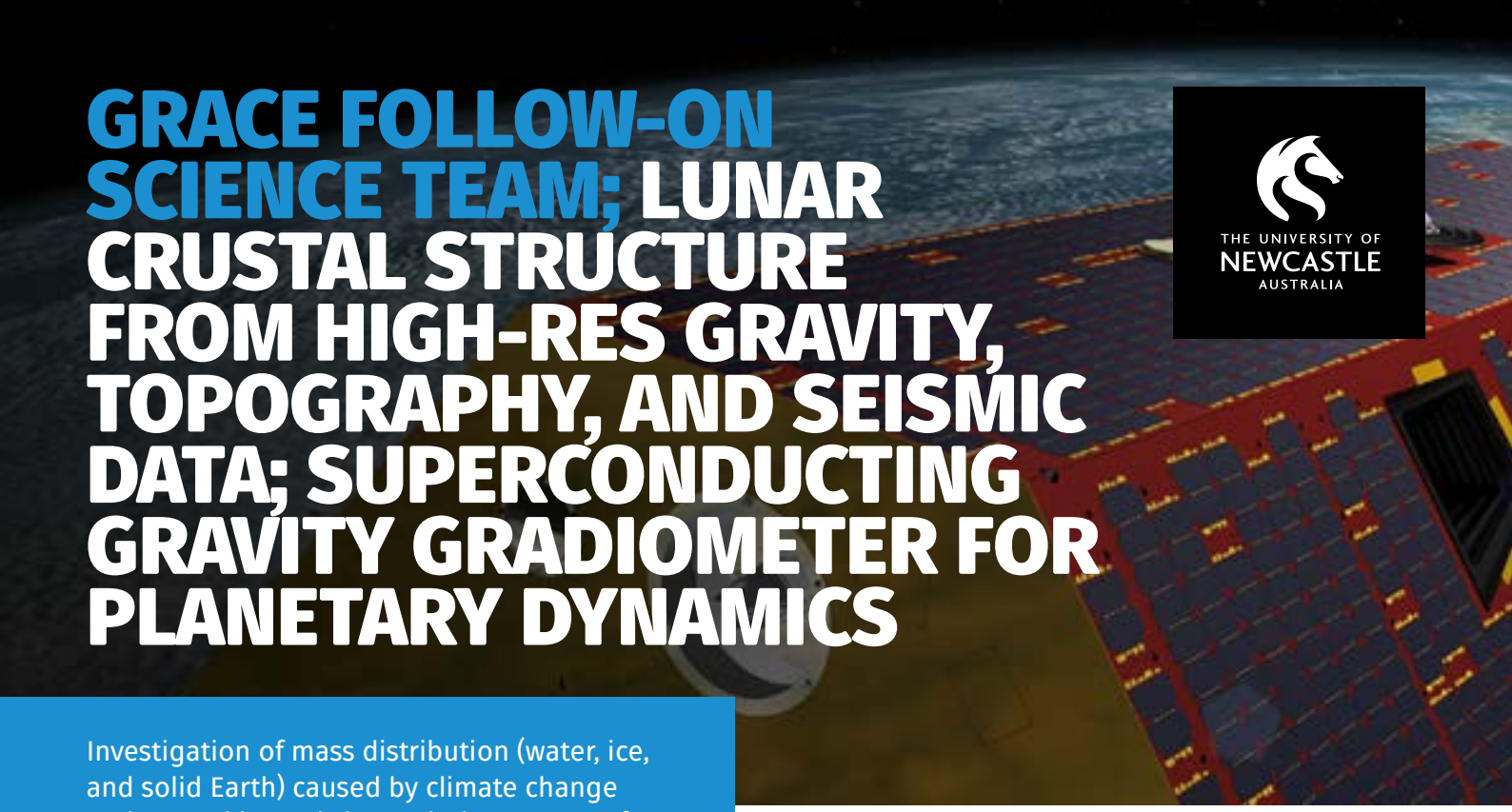
GRACE FOLLOW-ON SCIENCE TEAM; LUNAR CRUSTAL STRUCTURE FROM HIGH-RES GRAVITY, TOPOGRAPHY, AND SEISMIC DATA; SUPERCONDUCTING GRAVITY GRADIOMETER FOR PLANETARY DYNAMICS



THE UNIVERSITY OF NEWCASTLE AUSTRALIA

Investigation of mass distribution (water, ice, and solid Earth) caused by climate change and natural hazards by analysing spacecraft radar and laser ranging, accelerometer, and GNSS instruments. Development of the high-precision cryogenic gravimetric sensor. Detection of the Earth's gravity has implication to satellite trajectory, positioning, guidance and navigation.

COMPETITIVE ADVANTAGE

By precisely tracking the spacecraft trajectory changes, the satellite system can measure:

- amount of terrestrial water
- ocean tides, currents, gyres, and tsunami waves
- solid Earth deformation like earthquake and land subsidence
- polar region ice melts

SUCCESSFUL APPLICATIONS OF RESEARCH

- Quantification of global and regional sea level rise
- Determination of polar region icesheet and glacier melts
- Solid Earth deformation by earthquakes
- Measurement of water resource changes over large river basins
- Detection of significant density change of the lunar crust laterally and vertically

PARTNERS

- NASA Goddard Space Flight Center
- US Geological Survey
- Jet Propulsion Laboratory
- California Institute of Technology, University of Maryland

IMPACT

- Develop the Australian capability of precision orbit and gravity determination
- Develop the experience on the state-of-the-art satellite payload technology of GNSS, radar and laser tracking, accelerometer and star camera (attitude sensor)

CAPABILITIES AND FACILITIES

- Precision orbit determination of spacecrafts
- Processing GNSS and radar/laser ranging measurements
- Determination of gravity field and its spatial and temporal change
- Applications to remote sensing
- Detection of ionospheric disturbance to spacecraft trajectory and radio communication
- GNSS and IMU integration for airborne gravimetry and navigation

MORE INFORMATION

PROFESSOR SHIN-CHAN HAN
School of Engineering
T: +61 2 4921 5432
E: shin-chan.han@newcastle.edu.au

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