



QuakeCoRE

*supporting the development of an
Earthquake Resilient NZ*

Ken Elwood

QuakeCoRE Director

MBIE Chair in Earthquake Engineering

University of Auckland

QuakeCoRE Leadership Team



Ken Elwood

(Director)
University of Auckland



Brendon Bradley

(Deputy Director)
University of Canterbury



Misko Cubrinovski

University of Canterbury



Nick Horspool

GNS Science



Jason Ingham

University of Auckland



David Johnston

Massey University/GNS Science



Erica Seville

Resilient Organisations



Liam Wotherspoon

University of Auckland



Tim Sullivan

University of Canterbury

QuakeCoRE Board



Dean Kimpton (Chair)

COO, Auckland Council



Mary Comerio

Professor of the Graduate School,
University of California, Berkeley



Rod Carr

VC, University of Canterbury



John Hare

CEO, Holmes Consulting Group



Margaret Hyland

Chief Scientist, MBIE
Professor, University of Auckland



Nick Miller

Managing Director, Fulton Hogan



John Reid

Ngāi Tahu Research Centre,
University of Canterbury



Sulo Shanmuganathan

Independent Consultant – Civil &
Structural Engineer

QuakeCoRE Support Team



Susie Meade
(Centre Manager)
University of Canterbury



Brandy Alger
(Outreach Coordinator)
University of Canterbury



Ruth Hartshorn
(Research Coordinator)
University of Canterbury



Danica Nel
(Administrator)
University of Canterbury



Rushaina Variava – UA Supported
(UA Engineering Office Coordinator)
University of Auckland

QuakeCoRE is transforming the earthquake resilience of communities and societies through...

Innovative world-class **research**

Education of the next generation

Deep national & international **collaborations**

1

Improved Earthquake Resilience

Research-informed policies and practices for step-change in earthquake resilience

2

Improved Economic and Commercial Outcomes

Reduced losses in future earthquakes, rapid recovery, and growth of NZ earthquake resilience innovation driving international competitiveness

3

Improved Societal Outcomes

Enable communities to recover rapidly through mitigation and pre-disaster preparation

4

Highly Skilled and Diverse Workforce

Work-ready graduates taught in national and international multi-disciplinary environment. Support under-represented groups to promote equity in engineering

5

International Recognition

Focal point for international earthquake resilience, attracting the best talent and developing research collaborations

6

Growing Mātauranga Māori

Building close engagement with Māori leaders, developing opportunities for capacity building and learning from indigenous knowledge

Growing Mātauranga Māori

Research is not
specifically
relevant to
Māori

Research is
specifically
relevant to
Māori

Research
involves Māori

Māori-centred
research

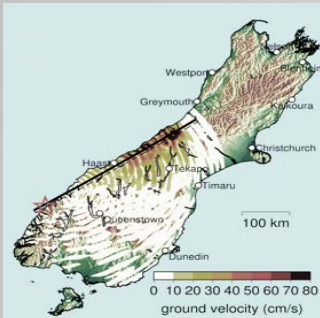
Kaupapa Māori
research



Orongomai marae, QuakeCoRE VM Consultation

Tā Mark Solomon Keynote – Tomorrow 10:30am

Research: Flagship Programmes



Ground motion simulation and validation

*Leader: Brendon Bradley
Deputy: Didier Pettinga*



Liquefaction impacts on infrastructure

*Leader: Misko Cubrinovski
Deputy: Sjoerd van Ballegooy*



Addressing Earthquake-Vulnerable Buildings

*Leader: Ken Elwood
Deputy: Ilan Noy*



Next-generation infrastructure

*Leader: Tim Sullivan
Deputy: Rick Henry*



Pathways to resilience

*Leader: David Johnston
Deputies: Caroline Orchiston
and Wendy Saunders*



SPECIAL PROJECT: Distributed infrastructure

*Leader: Liam Wotherspoon
Deputy: Roger Fairclough*

Research: Technology Platforms



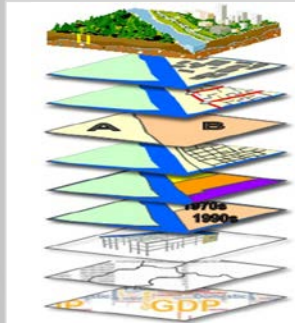
Large-scale laboratory facilities

Leader: Rick Henry
Deputy: Alessandro Palermo



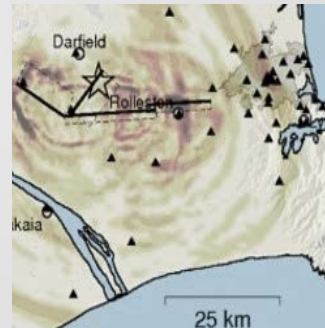
Field testing and monitoring equipment

Leader: Liam Wotherspoon
Deputy: Quincy Ma



Multi-disciplinary community datasets

Leader: Nick Horspool
Deputy: Matthew Hughes



Computational simulation and data visualisation

Leader: Brendon Bradley
Deputy: Chris McGann

Technology Platform staff and Postdoctoral Fellows



QuakeCoRE
NZ Centre for Earthquake Resilience



Sung Bae
(IT Architect)
University of Canterbury



Seokho Jeong
(Field Research Engineer)
University of Canterbury



Yiqiu Lu
(Research Engineer)
University of Auckland



Viktor Polak – UC Supported
(Software Engineer)
University of Canterbury



Sharmila Savarimuthu
(Software Engineer)
University of Canterbury



Jonney Huang – Aligned
(Software Engineer)
University of Canterbury



Daniel Lagrava – Aligned
(Software Engineer)
University of Canterbury



Jason Motha – Aligned
(Software Engineer)
University of Canterbury



Sarah Bastin
(FP2 Postdoctoral Fellow)
University of Canterbury



Dmytro Dizhur
(FP3 Postdoctoral Fellow)
University of Auckland



Tracy Hatton
(FP5 Postdoctoral Fellow)
Resilient Organisations



Saree Lawler
(FP5 Postdoctoral Fellow)
Resilient Organisations



Trevor Yeow
(FP4 Postdoctoral Fellow)
University of Canterbury

Research Excellence Recognition

Research excellence of our investigators recognised through numerous personal and research paper awards

International

Brendon Bradley, EERI Shah Family Innovation Prize for creativity, innovation and entrepreneurial spirit in earthquake risk mitigation and management. *Earthquake Engineering Research Institute (EERI)*, April 2016.

Jason Ingham, Stan Shaw Best Paper Award. *24th Australasian Conference on the Mechanics of Structures and Materials, Curtin University*, 2016

Roberto Leon, Wen Yuen Kam and **Stefano Pampanin**, ACI Design Award, recognising a paper that contributes advanced concepts and techniques applied to a specific design project. *American Concrete Institute (ACI)*, 2016

Misko Cubrinovski and **Brendon Bradley**, Norman Medal. *American Society of Civil Engineers (ASCE)*, 2016

National

D Johnston, Ministerial CDEM Silver Award, *Ministry of Civil Defense and Emergency Management*

Ivano Giongo, Aaron Wilson, **Dmytro Dizhur**, Hossein Derakhshan, Roberto Tomasi, Michael Griffith, Pierre Quenneville and **Jason Ingham**, Otto Glogau Award, for the best paper in NZSEE Bulletin in the previous three years. *New Zealand Society for Earthquake Engineering (NZSEE)*, 2016.

Greg MacRae and Ben Westenberg, Best student presentation, a NZSEE Conference, *New Zealand Society for Earthquake Engineering (NZSEE)*, 2016

Geoff Rodgers, Early and Emerging Career Researcher Award, awarded annually by the University of Canterbury - recognising emerging researchers and their contributions to research. *University of Canterbury*, 2016

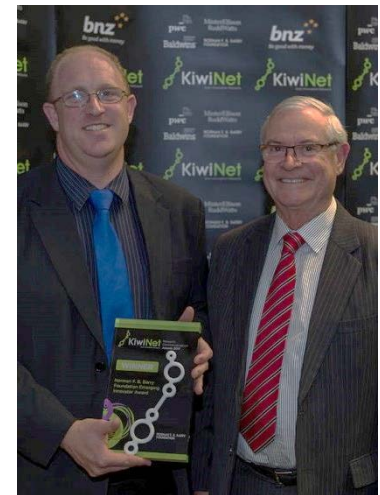
Masoud Sajoudi, Suzanne Wilkinson and **Seosamh Costello**, The Urban Research Network - Highly Commended Paper Award, *International Conference on Building Resilience*, 2016

Alex Shegay, **Rick Henry**, **Chris Motter** and **Ken Elwood**, Sandy Cormack Award; Best paper, for the best paper at the 2016 NZSC conference. *New Zealand Concrete Society (NZCS)*, 2016

Dmytro Dizhur, Ivan Skinner Award for the Advancement of Earthquake Engineering Research in New Zealand, *New Zealand Society for Earthquake Engineering*, 2017.

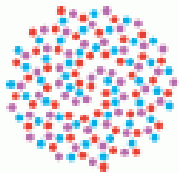
Geoff Rodgers, KiwiNet Awards, Norman F.B. Barry Foundation Emerging Innovator Award

Brendon Bradley, Prime Minister's MacDiarmid Emerging Scientist Prize. 2017



Centres of Research Excellence (CoRE)

“To encourage the development of excellent tertiary education-based research that is collaborative, strategically focused and creates significant knowledge transfer activities.” – Tertiary Education Commission



MAURICE WILKINS CENTRE
FOR MOLECULAR BIODISCOVERY



The MacDiarmid Institute
for Advanced Materials and Nanotechnology



Riddet Institute
FOOD | INNOVATION | HEALTH



NGĀ PAE O TE
MĀRAMATANGA



Brain Research
NEW ZEALAND
Rangahau Roro Aotearoa



DODD-WALLS CENTRE



Bio-Protection
Bioprotection science for New Zealand

MedTech CoRE



Te Pūnaha Matatini
Data • Knowledge • Insight

Research funding landscape



National Research

Provides a focal point for research excellence in NZ earthquake resilience and connections with an ecosystem of stakeholders and funders.



Universities

Iwi Engineering Practitioners

Natural Hazards Research Platform

MCDEM EQC GNS

QuakeCoRE

Local government GeoNet

Resilience to Nature's Challenges

MBIE – Building Performance BRANZ

CoREs UC Quake Centre

Who are we – CoRE model

- ✓ CoRE Principal Investigators
 - Lead the direction of QuakeCoRE Research
- ✓ CoRE Associate Investigators
 - Actively involved in QuakeCoRE Research
- ✓ Industry Affiliates
 - End-users and stakeholders engaged with QuakeCoRE
- ✓ Collaborating Organizations
 - Domestic and international organisations collaborating with QuakeCoRE

Apply online!

www.quakecore.nz/opportunities/

International Networks



International Joint Research Laboratory of Earthquake Engineering



- MOU signed between QuakeCoRE and ILEE (Tongji, China) May 2016
- Assess to large scale testing facilities not available in NZ
- Joint funded project “Shake-table testing of a low-damage concrete wall building”, led by Rick Henry, Geoff Rogers, Ying Zhou, Tony Yang

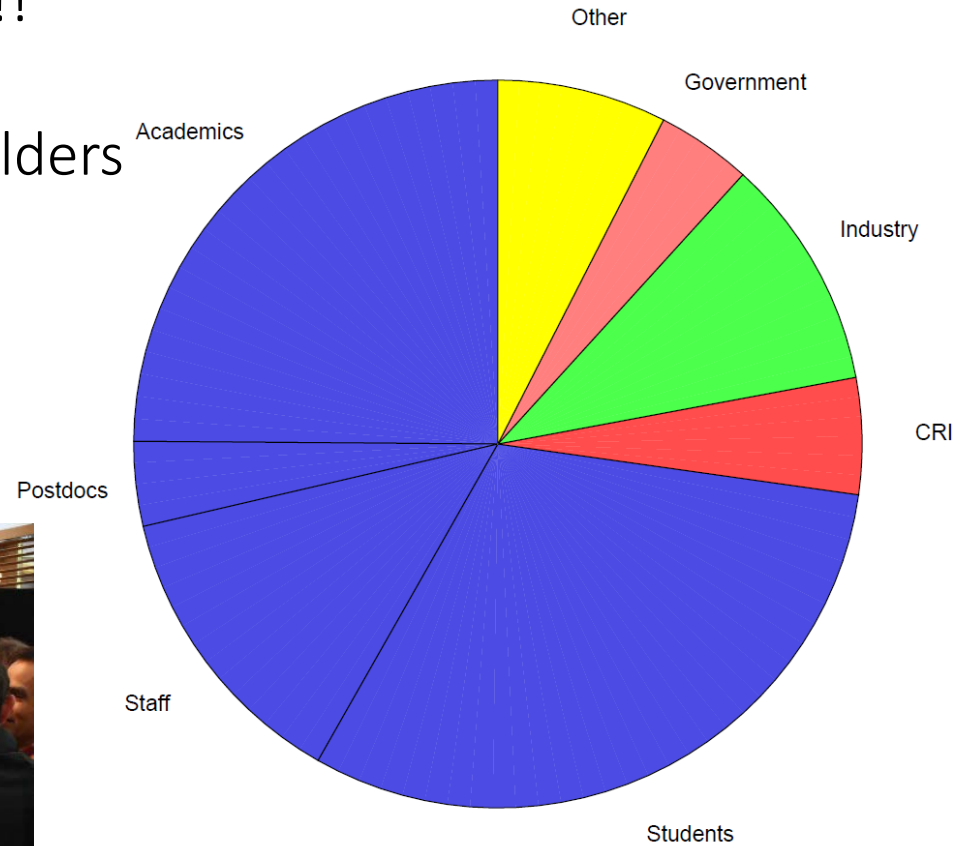
Annual Meeting

A focal point for collaboration.

- ✓ 200+ participants – Full House!!
 - 20+ from overseas
 - 50+ from industry/stakeholders
- ✓ Centred around posters
- ✓ Future focused plenaries
- ✓ Planning for 2018

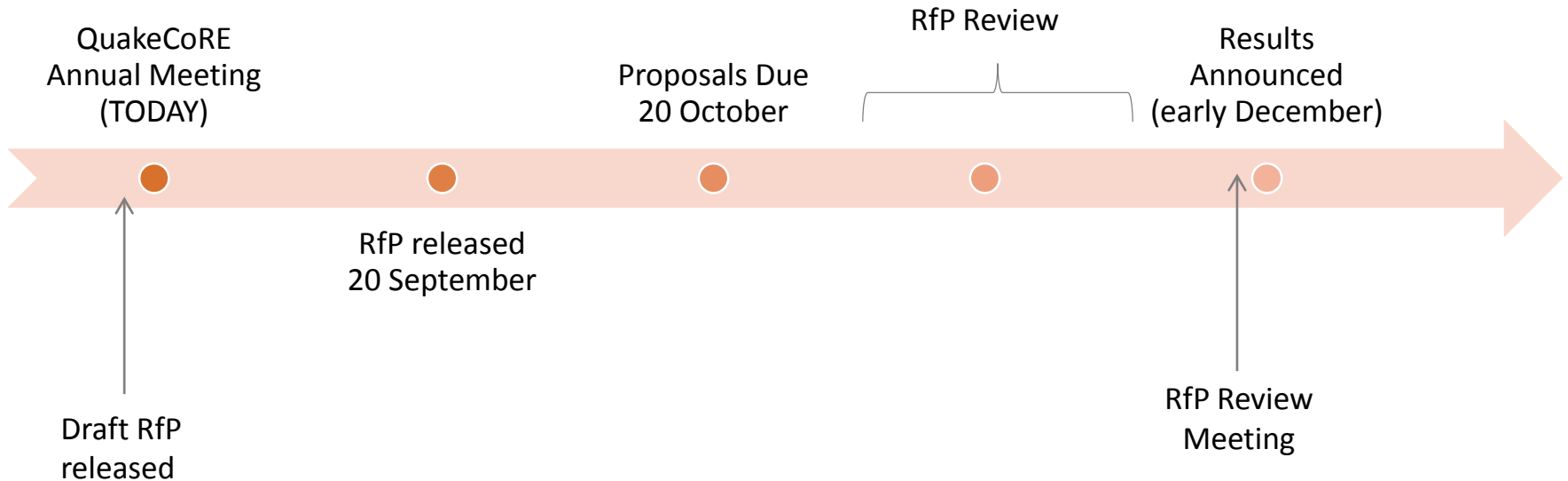


2017 Participants



Annual Request for Proposal (RfP)

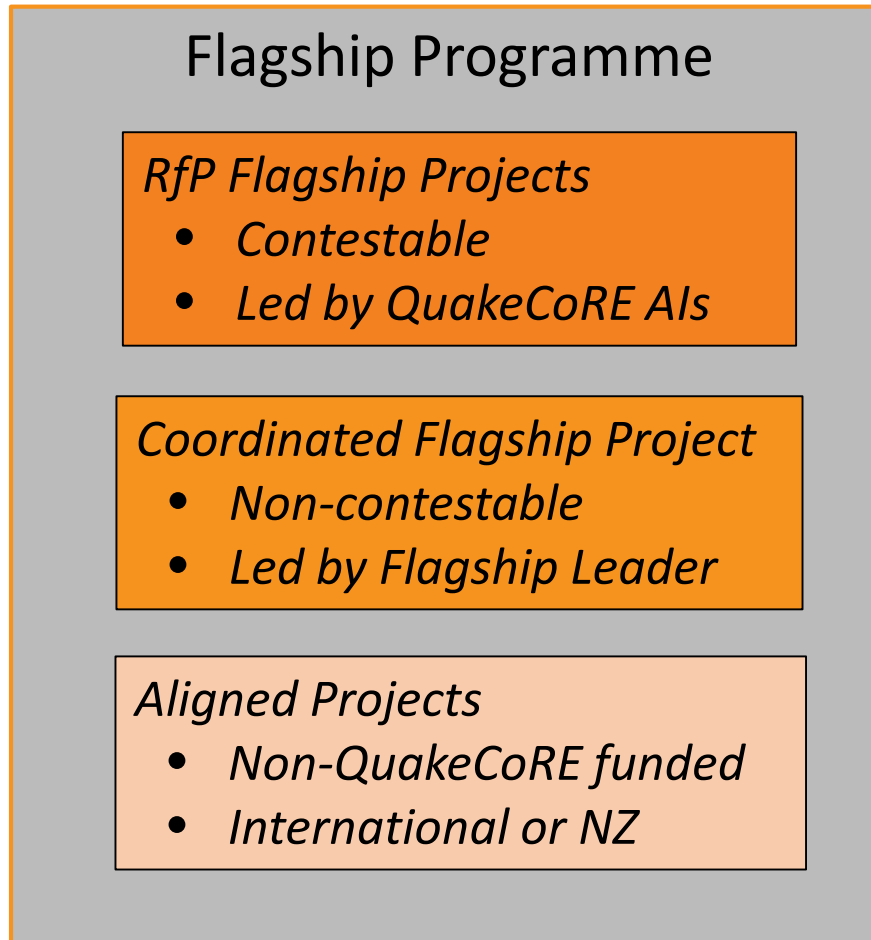
Key mechanism for funding research in QuakeCoRE



- ✓ Review draft RfP
- ✓ Discuss ideas with colleagues and Flagship Leaders

NEW for 2018

Coordinated Flagship Projects



Monthly
Zoom
Calls

How to get involved

QuakeCoRE is more than a funding source



QuakeCoRE
NZ Centre for Earthquake Resilience

Apply for our PhD Scholarships

If you are a prospective PhD student, contact a QuakeCoRE research supervisor about opportunities for joining QuakeCoRE.

Apply to our RfP

Our annual request for proposals is released in the third quarter of each year

Collaborate with us

If you have a significant research activity which aligns with that of QuakeCoRE please get in touch. We welcome you to join any of our monthly Flagship video conference calls.

Apply to be an Associate Investigator

NZ-based researchers who are committed to advancing the goals of QuakeCoRE and contributing to the QuakeCoRE mission.

Apply to be an Industry Affiliate

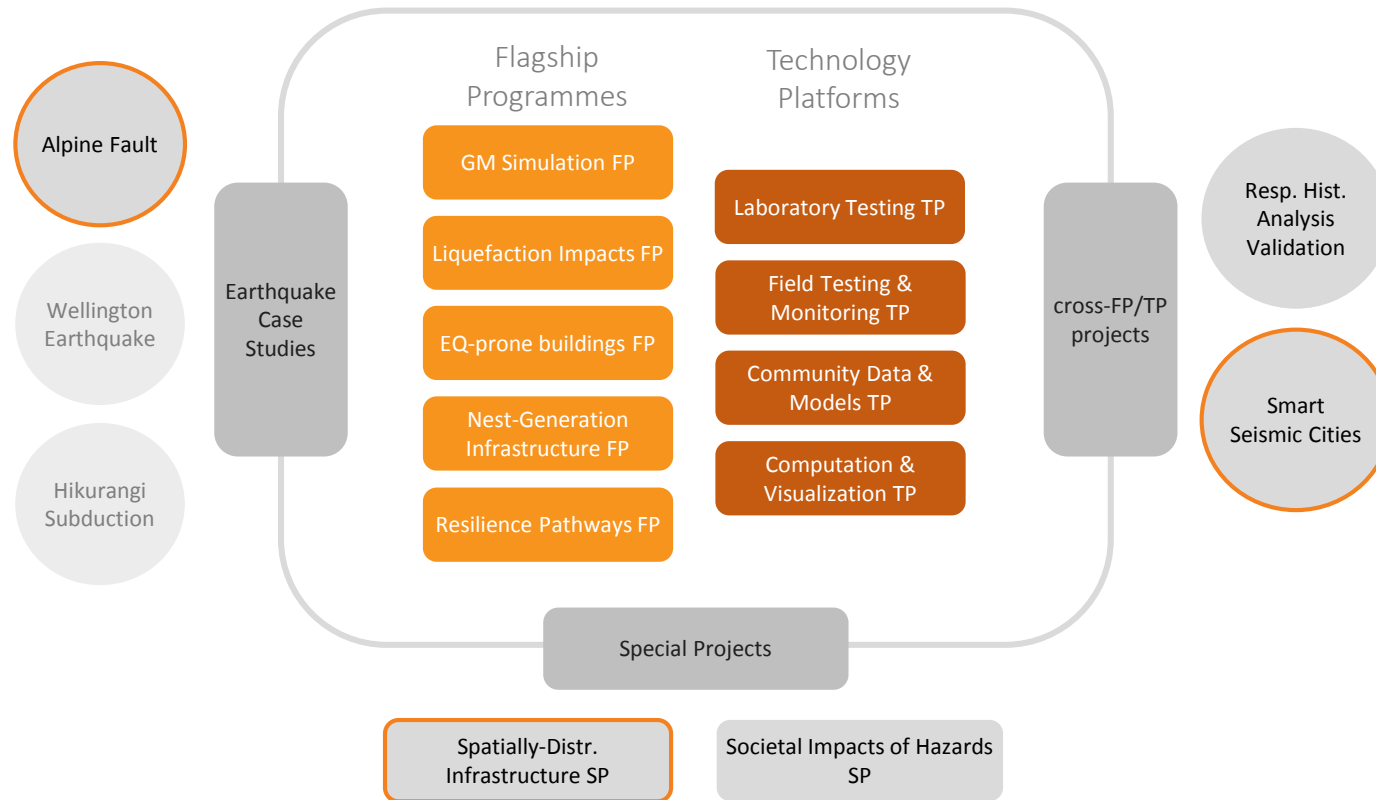
Any stakeholder or industry practitioner who is engaged with QuakeCoRE and would like to acknowledge this relationship by being named as an Industry Affiliate.

www.quakecore.nz/opportunities/

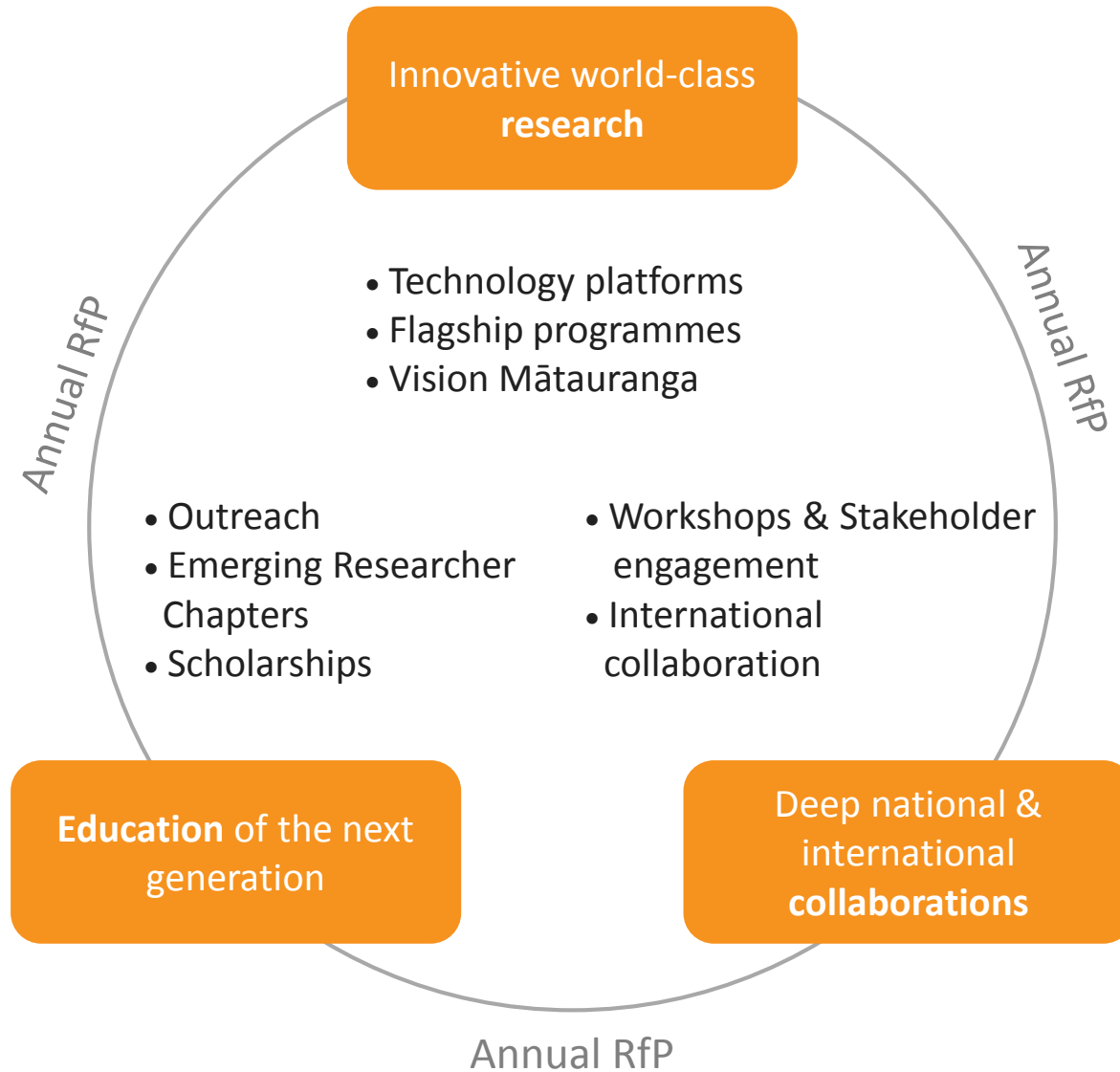
Thank you!

www.quakecore.nz

Research: Research Structure



QuakeCoRE Activities



National & International Workshops

Title	Location
Utilisation of ground motion simulations in engineering practice	Christchurch
Ground motion simulation and validation	QuakeCoRE Annual Meeting
International workshop on ground motion simulation validation	Palm Springs, US
Liquefaction Research Priorities	QuakeCoRE Annual Meeting
U.S. – N.Z. – Japan International Workshop on “Liquefaction-Induced Ground Movements Effects”	Berkeley, US
Research Priorities for Addressing Earthquake-Prone Buildings	QuakeCoRE Annual Meeting
Addressing URM risk in an aftershock environment	Wellington
Economics of Earthquake Resilience – identifying gaps in our applied knowledge	Wellington
DPRI – QuakeCoRE Student Forum	Kyoto, Japan
International Workshop on Seismic Performance of RC Wall Systems	Christchurch
15th U.S.-Japan-NZ Workshop on Improvement of Structural Engineering and Resiliency	Nara, Japan
Joint QuakeCoRE/PREEMPTIVE Workshop on Low Damage Design (US-NZ)	Christchurch and QuakeCoRE Annual Meeting
NZ-Japan Workshop on Seismic Performance of RC Wall Buildings	Auckland
NZ-Japan Workshop on Kumamoto and Kaikoura Earthquakes	Christchurch
Transport Resilience Workshop	Auckland
Deciding between Resilience Investment Options	QuakeCoRE Annual Meeting
Kaikoura Earthquake Social Science Research Workshop	Wellington

Outreach

