



# ReMSTEP

RECONCEPTUALISING  
MATHEMATICS  
AND SCIENCE

TEACHER EDUCATION PROGRAMS



Australian Government



Office for  
Learning & Teaching

# THE ROLE OF THE CLT

Ms  
**SUZI**  
HEWLETT

Branch Manager, Office for Learning and Teaching



# OVERVIEW

Prof  
**STEPHEN**  
DINHAM

University of Melbourne



# OVERVIEW



There have been consistent concerns over maths and science in Australia

- Some primary teachers lack confidence and competence in teaching maths and science
- Student attitudes and achievement powerfully predict performance in the secondary years
- Up to one third of secondary students are taught maths and up to one quarter of secondary students are taught science by an out-of-field teacher
- This situation is worse in government, low SES and regional and remote schools and contributes to the achievement gap.

# OVERVIEW



- Too few students are attempting the higher level courses in maths and science in the senior secondary years
- Too few students enrol in undergraduate maths and science subjects and courses
- Many university maths departments have closed or shrunk
- There are shortages of maths and science pre-service teaching candidates
- Lack of cooperation between education and maths and science faculties
- This is a cycle that needs to be broken

# OVERVIEW



## The Program

The purpose of the Program, Enhancing the Training of Mathematics and Science Teachers, is to drive major improvement in the quality of mathematics and science teachers by supporting new pre-service programs in which faculties, schools or departments of science, mathematics and education collaborate on course design and delivery, combining content and pedagogy so that maths and science are taught as dynamic, forward-looking and collaborative human endeavours.

# OVERVIEW



## The ReMSTEP project

This project will develop new teacher education practices that align contemporary mathematics and science with innovative and engaging pedagogy through a focus on practice. Teacher education activities will be integrated across a range of educational settings and world-class research sites. There will be a legacy of new courses, resources and productive alliances but most importantly, a cohort of better equipped, more confident and competent primary and secondary teachers of maths and sciences.

# OVERVIEW



## Success through Seven Innovations

- Innovation 1: Contemporary science and mathematics in integrated science and pre-service units of study.
- Innovation 2: Undergraduate science students engaging with schools.
- Innovation 3: Science specialisations within primary pre-service programs.
- Innovation 4: Specialist Science and Technology Centre collaborations.
- Innovation 5: Practicum opportunities in world class research environments.
- Innovation 6: Building on existing student expertise in science and mathematics.
- Innovation 7: Building a recruitment pipeline of high potential mathematics and science teachers.

Prof  
**RUSSELL**  
TYTLER

Deakin University

Assoc Prof  
**STUART**  
PALMER



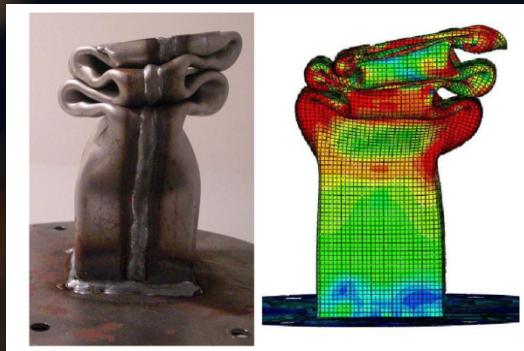


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# DEAKIN



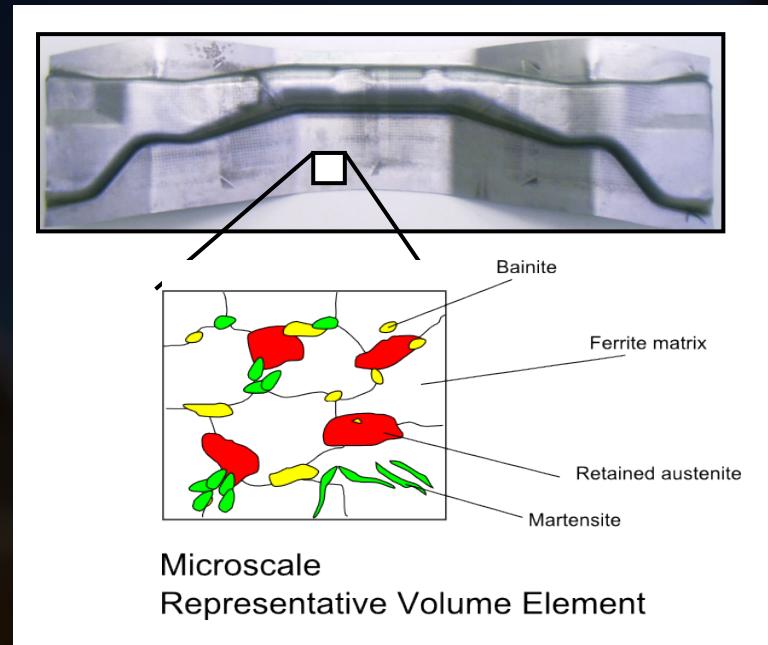
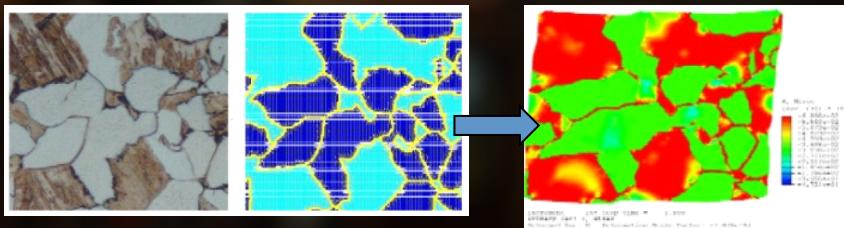
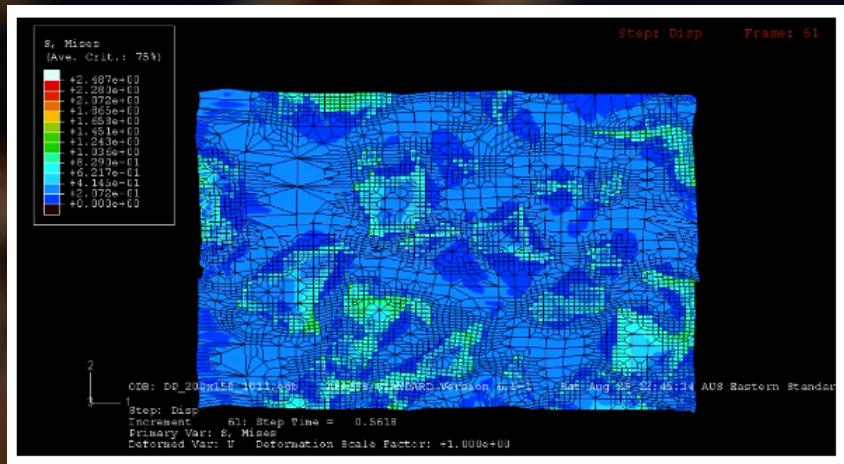
Research, Design & Engineering @ Institute for Frontier Materials



# DEAKIN



## Modelling material behaviour - Multi-scale Modelling



# DEAKIN



Specialist science & mathematics centres

**bioLAB**  
VICTORIAN BIOSCIENCE  
EDUCATION CENTRE

THEME: HUMAN PERFORMANCE

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graph TD; A[ANATOMY & PHYSIOLOGY] --> C((THEME: HUMAN PERFORMANCE)); B[BIOMECHANICS & PHYSICS] --> C; C --> D[ENGINEERING & MATERIALS]; C --> E[BIOTECHNOLOGY & BIOCHEMISTRY]; C --> F[STATISTICS & TECHNOLOGY]; C --> G[CAREERS]
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# DEAKIN



Specialist science & mathematics centres

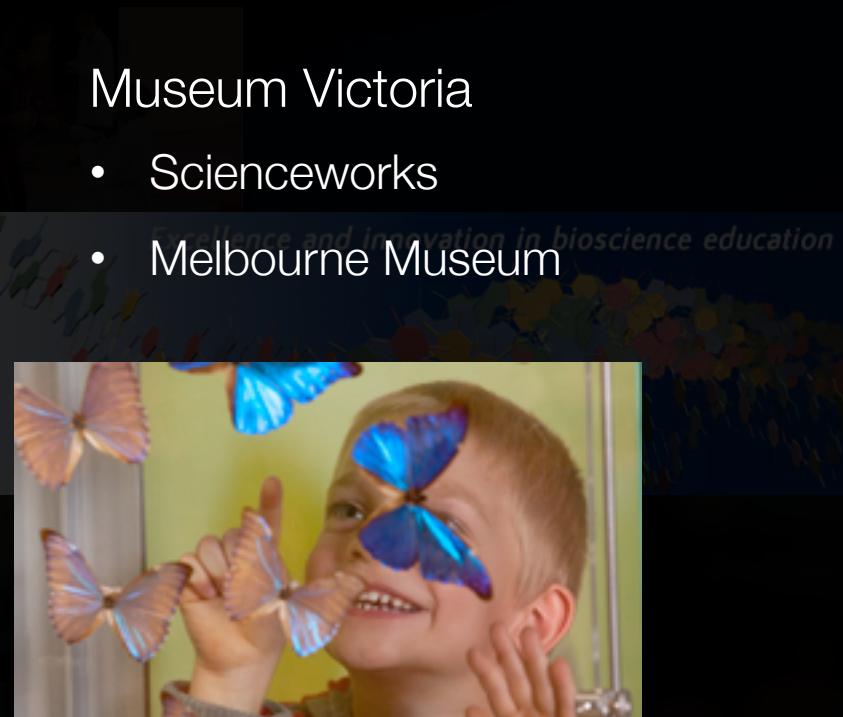
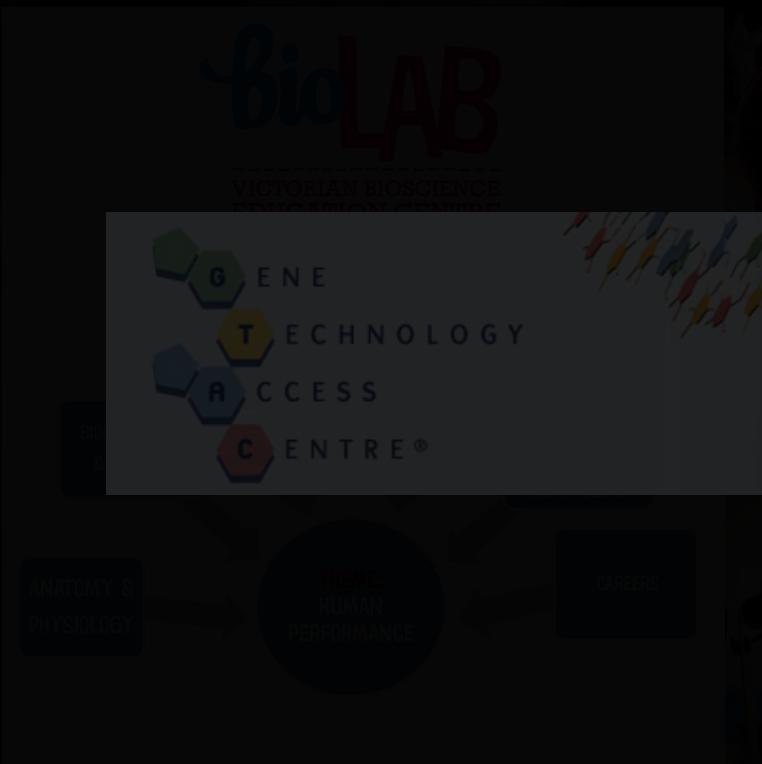
The collage includes:

- A large banner for "bioLAB VICTORIAN BIOSCIENCE EDUCATION CENTRE".
- A photograph of students in a lab setting.
- The logo for "GENE TECHNOLOGY ACCESS CENTRE®" featuring a hexagonal grid of colored shapes (green, blue, yellow, red).
- A banner with the text "Excellence and innovation in bioscience education" overlaid on a background of colorful, abstract molecular or cellular structures.
- A central circular graphic with the text "THEME: HUMAN PERFORMANCE" surrounded by arrows pointing to "ANATOMY & PHYSIOLOGY" and "CAREERS".
- A photograph of a person on a treadmill in a gymnasium.

# DEAKIN



Specialist science & mathematics centres



Museum Victoria

- Scienceworks
- Melbourne Museum



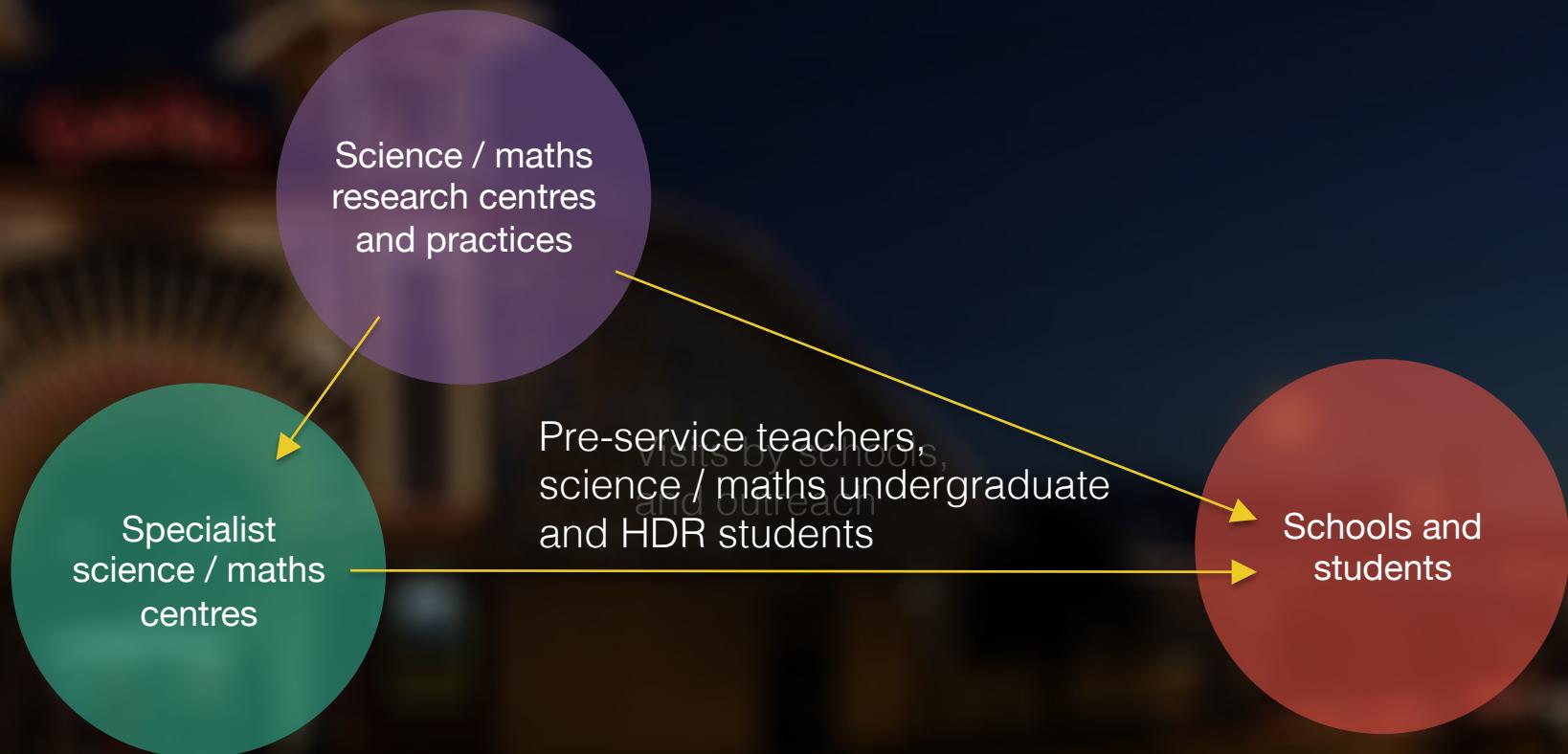
Inserting what's missing into the equation: Teacher education



# DEAKIN



Inserting what's missing into the equation: Teacher education



# DEAKIN



Inserting what's missing into the equation: Teacher education

- Collaboration between PhD and undergraduate science students, producing outreach resources/activities
- Refinement of these using REMSTEP specialists.
- Further refinement and trialing of activities and resources in science and mathematics method units
- Ongoing use of resources and activities in teacher education, in university classes and in schools.
- Involvement of PSTs and science students in specialist centre activities including school visits

Assoc Prof  
**LIZ**  
JOHNSON

Prof  
**VAUGHAN**  
PRAIN



La Trobe University



Innovation 1: pre-service teachers working with early career scientists to construct curriculum

## Our Partners

Faculty of Education

Faculty of Science,  
Technology & Engineering

Quantum Victoria

ReMSTEP partners

## Our Approach

Active collaborations

Personal relationships

Multiple settings: regional  
& metropolitan

# LA TROBE



Innovation 4: pre-service teachers working with Quantum Victoria

Focus on games technology, virtual reality, gesture-based computing, 3D printing, robotics and the physical sciences

Projects with La Trobe University: program development, outreach for schools

[www.quantumvictoria.vic.edu.au](http://www.quantumvictoria.vic.edu.au)

The screenshot shows the homepage of the Quantum Victoria website. At the top, there is a navigation bar with links for LATEST NEWS, HOME (which is highlighted in red), ABOUT US, WORK WITH US, PROGRAMS, and CONTACT US. Below the navigation bar is a large banner featuring the Quantum Victoria logo (the word 'Quantum' in red and 'VICTORIA' in white) and the text 'In partnership with LA TROBE UNIVERSITY'. The banner also includes a photograph of three scientists in lab coats and safety glasses conducting an experiment with glassware and a flame. At the bottom of the page, there is a horizontal menu with three items: 'STUDENT PROGRAMS', 'STUDENT SHOWCASE', and 'TEACHER DEVELOPMENT'. Each item has a small thumbnail image below it.

Prof  
**DEB**  
CORRIGAN

Assoc Prof  
**CRISTINA**  
VARSAVSKY



Monash University

JOHN MONASH SCIENCE SCHOOL







Assoc Prof

**MICHELLE**  
LIVETT

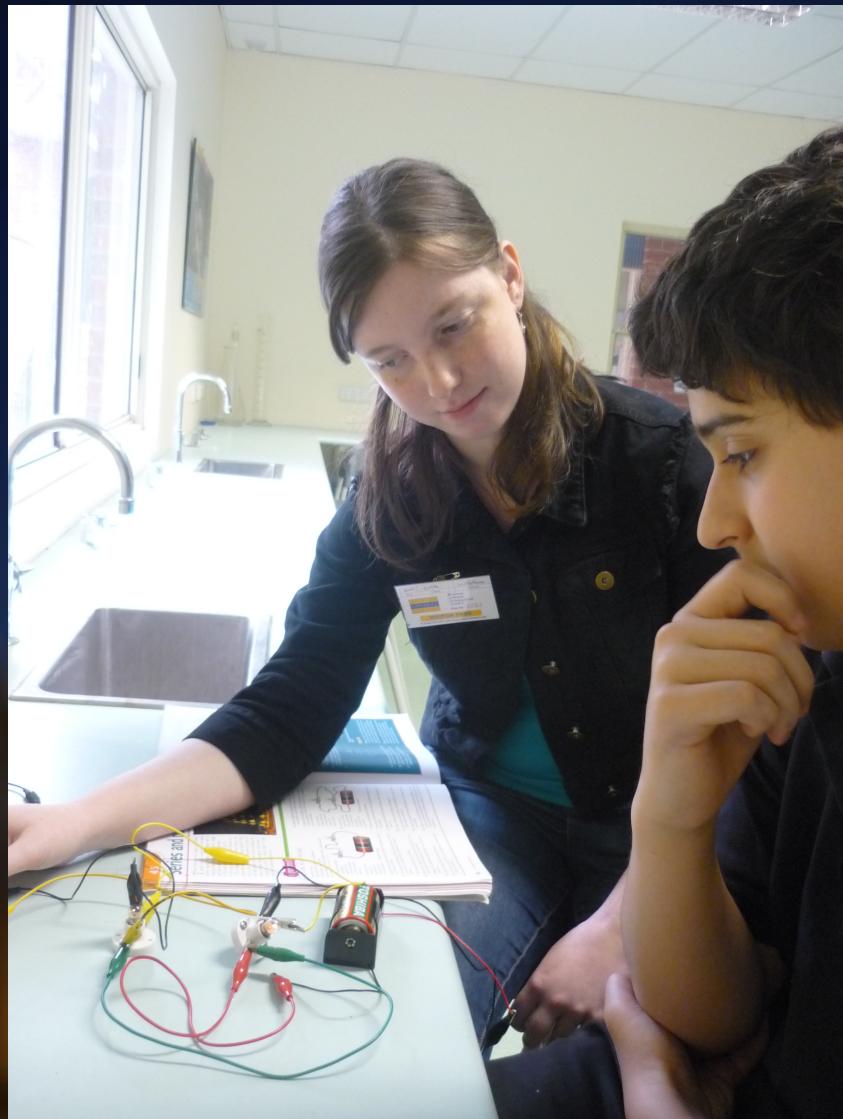
Dr

**LARISSA**  
MCLEAN DAVIES

University of Melbourne



THE UNIVERSITY OF  
MELBOURNE





Q & A



# ReMSTEP

