UNSW AUSTRALIA
Canberra

Never Stand Still

School of Engineering and IT

Don’t Waste Space

Dr Sean Tuttle

Initiatives at UNSW Canberra to use space technology to understand, monitor and mitigate the efects of climate change...

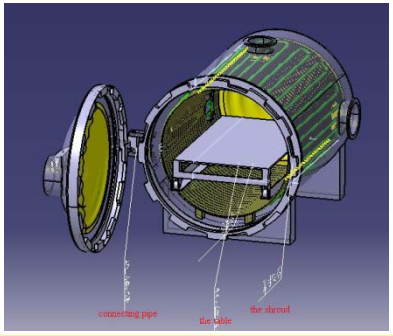
Presentation Outline

- Introduction to Me & UNSW Canberra
- Why am I here?
- What can we offer?
- Conclusions, Questions

Introduction

- University of New South Wales Canberra:
  - Space has been selected as a strategic area for the university
  - I am expanding this into new areas & building up test facilities
  - Currently we have expertise in tracking, remote sensing data processing and now spacecraft engineering
  - Education: Masters courses in space engineering, missions, sensors etc

- Dr Sean Tuttle:
  - 15 years in the European space industry: spacecraft design, build and test
    - Scientific missions: BepiColombo, Rosetta, Lisa Pathfinder, ExoMars Rover, EUCLID, PLATO, GAIA, Jupiter Ganymede Orbiter, Venus Express
    - EO Missions: MetOp, Cryosat 2, Sentinel 2, SWARM, Aeolus, ERS-1



UNSW AUSTRALIA
Canberra

Why am I here?

- To learn from this community
- To participate in this community
- To find out in which areas we could undertake useful research
- Because it is important & I want our research to contribute to something worthwhile

- **Space** can be a great motivator
- **Today's generation** is more environmentally aware than ever before and more global in its outloook than past generations

- *Combining these 2 factors is an opportunity not to be lost*

- *We must not waste the opportunities space technology offers us*

- *I am preaching to the converted here, of course!*

Some Thoughts from a „New Comer“

- Impressive how many people everwhere are actively engaged in innovative activities to deal with Climate Change in their regions
- Big space platforms versus small ones ➔ current state of the art
- Instrument types:
  - Optical (seems to be the dominnt one in current use)
  - Radar (eg seeing through the forest canopy), soil moisture
  - Active versus passive (cost, legislation) LIDAR, multi- & hyperspectral
  - Species compositions eg Carbon, CH4, at certain altitudes
- Big data ➔ what do we need? Do we even have it all already, without realising it? How do we manage it and communicate it effectively?
- Your own, specific data versus generic, foreign, international
- The use of ground sensor networks to augment and enhance what is already in space
- Using the current momentum to extend the initiatives beyond the immediate subject of Climate Change to biodiversity, sustainable living etc

What can we offer?

- Firstly, I'm hoping to learn that during this conference
- But secondly:
  - Spacecraft designs which can reduce size & cost of getting ideas into space
  - Mission concepts, including payload designs
  - PhD and Masters topics for students to undertake research in an area supporting the application of space technology to Climate Change
  - Education: could tailor specific short courses to suit needs

A: ➔ Empowerment

B: ➔ Monitoring vs „Countering" Climate Change

C: ➔ What is needed? What do we already have?

Concluding Remarks

- If you had a limited budget and there was ONE thing you could afford to measure, monitor or detect,
  - What would it be?
  - How often would you need to measure it? Once? Regular monitoring?
  - What could you use it for?
  - How important is ownership of the spacecraft versus purchase of the data?

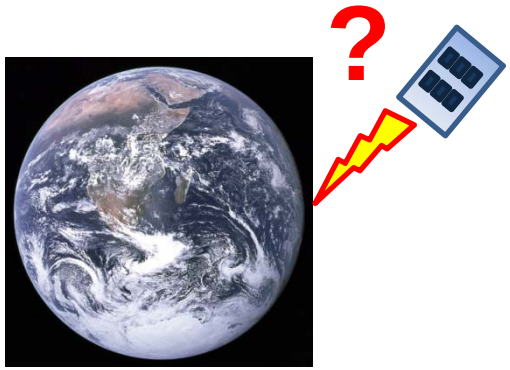


Image: NASA