

# The Institute of Computing for Climate Science

## WM02: Workshop



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Computing for  
Climate Science



Marla

Paul

Dominic Tom



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AIMS is a **call to action** to:

- Invest in STEM education to move Africa's development forward
- Increase collaboration between the public and private sector to prioritise STEM education in Africa
- Encourage policymakers to push the agenda of STEM education in Africa for the transformation and sustainable growth of the continent, especially as it pertains to increasing the number of women in the STEM fields
- Get Africa's most talented students to pursue an education in mathematical sciences to innovate and propel Africa's future.
- Increase partnership with industry to contribute to filling the skills gap in STEM, increase productivity and provide critical skills that are indispensable as Africa embarks on its industrial revolution



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# Maximise effectiveness of climate science research via...

Computer Science

Software Engineering

Programming Languages & systems      Mathematics

Data Science

Machine learning

## ICCS is a member of the Virtual Institute of Scientific Software (VISS):

- University-based software engineering centres

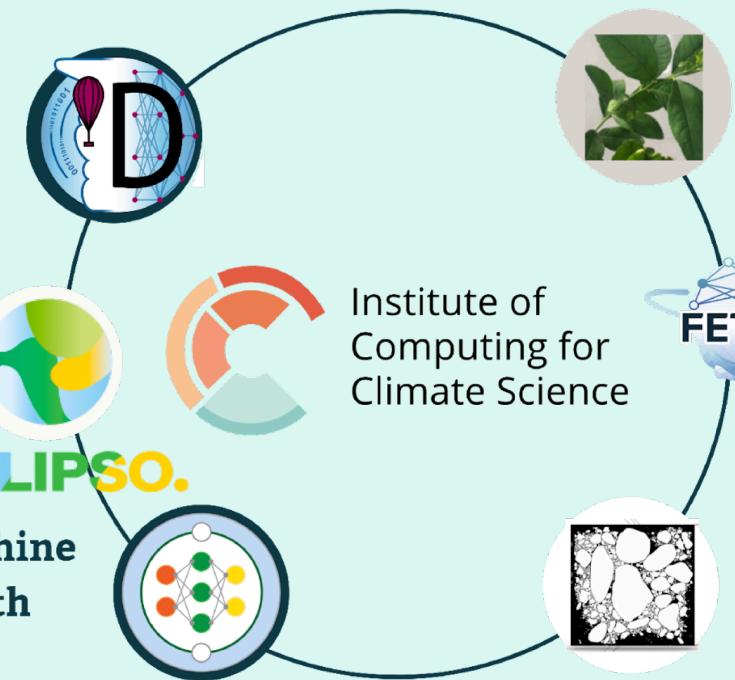
## ICCS collaborates with the Virtual Earth System Research Institute (VESRI):

- Six research groups aiming to improve the accuracy and credibility of major climate models.



# VESRI Teams

**DataWave:** Collaborative Gravity Wave Research



**CALIPSO:** Carbon Loss In Plants, Soils and Oceans

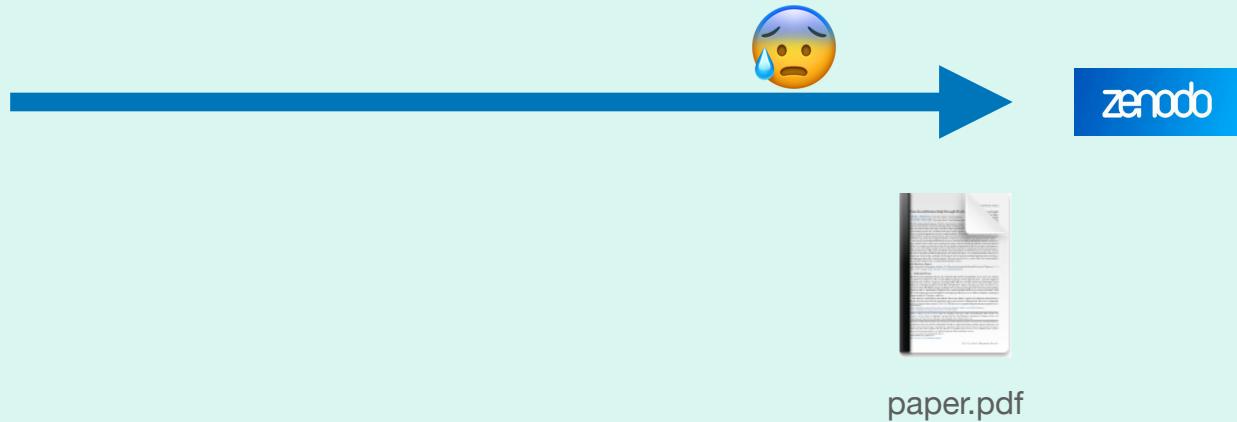
**M<sup>2</sup>LInES:** Multiscale Machine Learning In Coupled Earth System Modeling

**LEMONTREE:** Land Ecosystem Models based On New Theory, obseRvations, and ExperimEnts

**FETCH<sub>4</sub>:** Fate, Emissions, and Transport of CH<sub>4</sub>

**SASIP:** The Scale-Aware Sea Ice Project

# Why consider software engineering in climate science?



# Reproducibility and reusability: ensure research keeps having impact



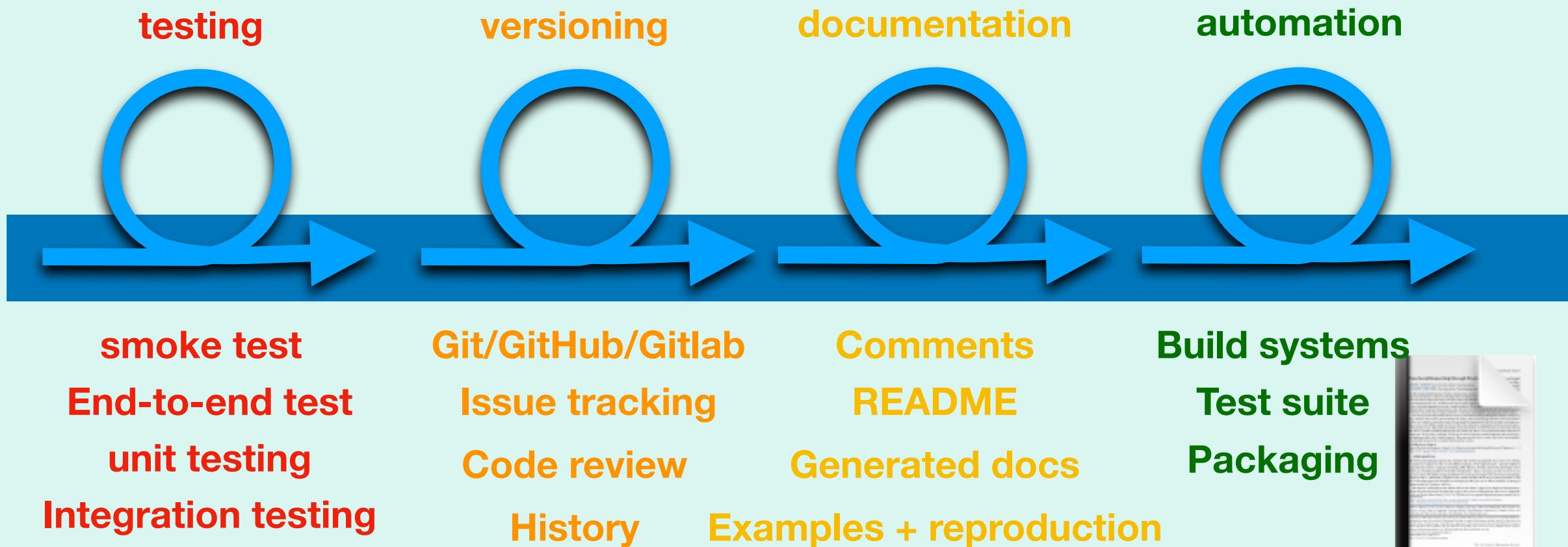
# Reproducibility and reusability: ensure research keeps having impact



Importance being now recognised by funders too



# Supports collaborative research + development stage



# Agenda

09:00-09:10 – **Welcome & Introduction**

09:00-10:30 - **Using Git and GitHub Effectively** (Tom)

10:30-11:00 - Coffee break

11:00-11:30 - **Exercises for Git/GitHub**

11:30-12:00 - **1 slide 'calls for support/help/collaboration'** - This is the session where people can explain what problems they are having with the hope of us then linking people up within the cohort / us picking things up with people / linking them with others, during the rest of the week

12:00-13:30 - Lunch

13:30-14:30 - **Using types of rule out bugs: Python vs Fortran perspective** (Dominic)

14:30-15:30 - **GPU Programming Part 1** (Paul)

15:30-16:00 - Coffee

16:00-17:00 - **GPU Programming part 2** (Paul)  
END

17:00-17:30 - Extra time for '**calls for support/help/collaboration**' if needed



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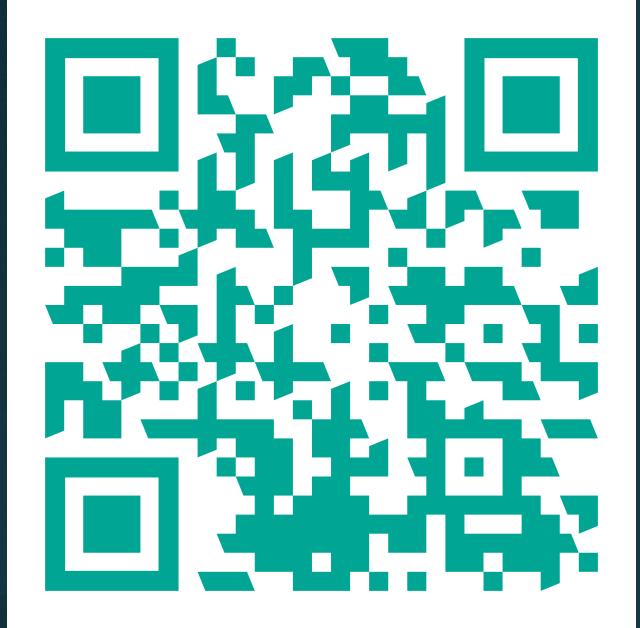
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