INTRODUCTION

South Africa has nominated Astronomy as a “flagship science” and aims to be an international Astronomy hub through projects such as Very Long Baseline Interferometry (VLBI - HartRAO), the Square Kilometre Array (SKA) and the South African Large Telescope (SALT).

Astronomy offers a door for learners to enter into careers in science and technology - fully supported by government.
Performance on:

- Annual National Assessment (ANA)
- International M&S Survey (TIMSS)
- Global Competitiveness Report (GCR)

Focus on Maths and Science
Curriculum and Assessment Policy Statement (CAPS) - every subject have own CAPS document

Knowledge strands are used as tools for organising the content of a specific subject

“Planet Earth and Beyond” forms part of the subject Natural Sciences
Most teachers that specialised in Natural Sciences, never covered Astronomy in their training. Astronomy used to be part of Geography.
RESEARCHERS

- Hartebeesthoek Radio Astronomy Observatory (HartRAO)
- University of South Africa (UNISA)
AIM OF RESEARCH

• to assist teachers to gain more knowledge and skills to teach the strand “Planet Earth and Beyond” with confidence

• to promote a science culture among teachers and learners

• to improve learners’ performance on the Timms and ANA, by using the strand “Planet Earth and Beyond” as a driver

• inspiring learners (female) and attracting them into the study of Natural Sciences
RESEARCH QUESTION

To what extent do teachers have enough content and pedagogical knowledge to teach “Planet Earth and Beyond”? 

Sub-questions:
• do teachers have curriculum aligned resources?
• do teachers have interactive resources for demonstration purposes?
• do teachers have the necessary knowledge and skills to use the resources?
RESEARCH METHOD

• Literature review
• Quantitative design
LITERATURE REVIEW

- “Planet Earth and Beyond” is very detailed and difficult for teachers without full knowledge and understanding to teach.
- Projects are complicated for learners and can pose challenges especially for under resourced schools.
- Teachers not trained to teach Astronomy.
• “Planet Earth and Beyond” strand is generally regarded as the worst taught and most avoided Natural Sciences knowledge strand

• Some teachers lack content and pedagogical knowledge in Astronomy

• Some schools do not have resources or teachers do not know how to use the resources
Focus on Teachers
Investigate the needs of Natural Science teachers

Questionnaire 3 section

• Section A: Biographical information
• Section B: Teaching - statements on 6 point likert scale
• Section C: Knowledge - statements - True/False
• Stratified sampling method was used
• Sample size 200 primary schools in Gauteng
• All grade 4-7 teachers teaching Natural Sciences (700)
Questionnaire: pilot study completed

- Twenty schools (60 teachers) in Gauteng
- Raw data available

Teachers not trained to teach Natural Sciences and Astronomy
OUTCOMES OF RESEARCH

• Publish articles (accredited journals)
• Design workshop material
• Design a short learning programme
Workshop material

• The 21st century learner
• How to balance content knowledge and pedagogical knowledge with technology
• Curriculum aligned resources and interactive resources for demonstration purposes
CONCLUSION

- Teachers will gain more knowledge and skills to teach the strand “Planet Earth and Beyond” with confidence
- Promote a science culture among teachers and learners
- Contribute positively to the Millennium Development Goals
CONCLUSION

Design a short learning programme in Astronomy for Teachers
THANK YOU