SKA Overview

CASCA SKA Lunch

SQUARE KILOMETRE ARRAY

Exploring the Universe with the world's largest radio telescope

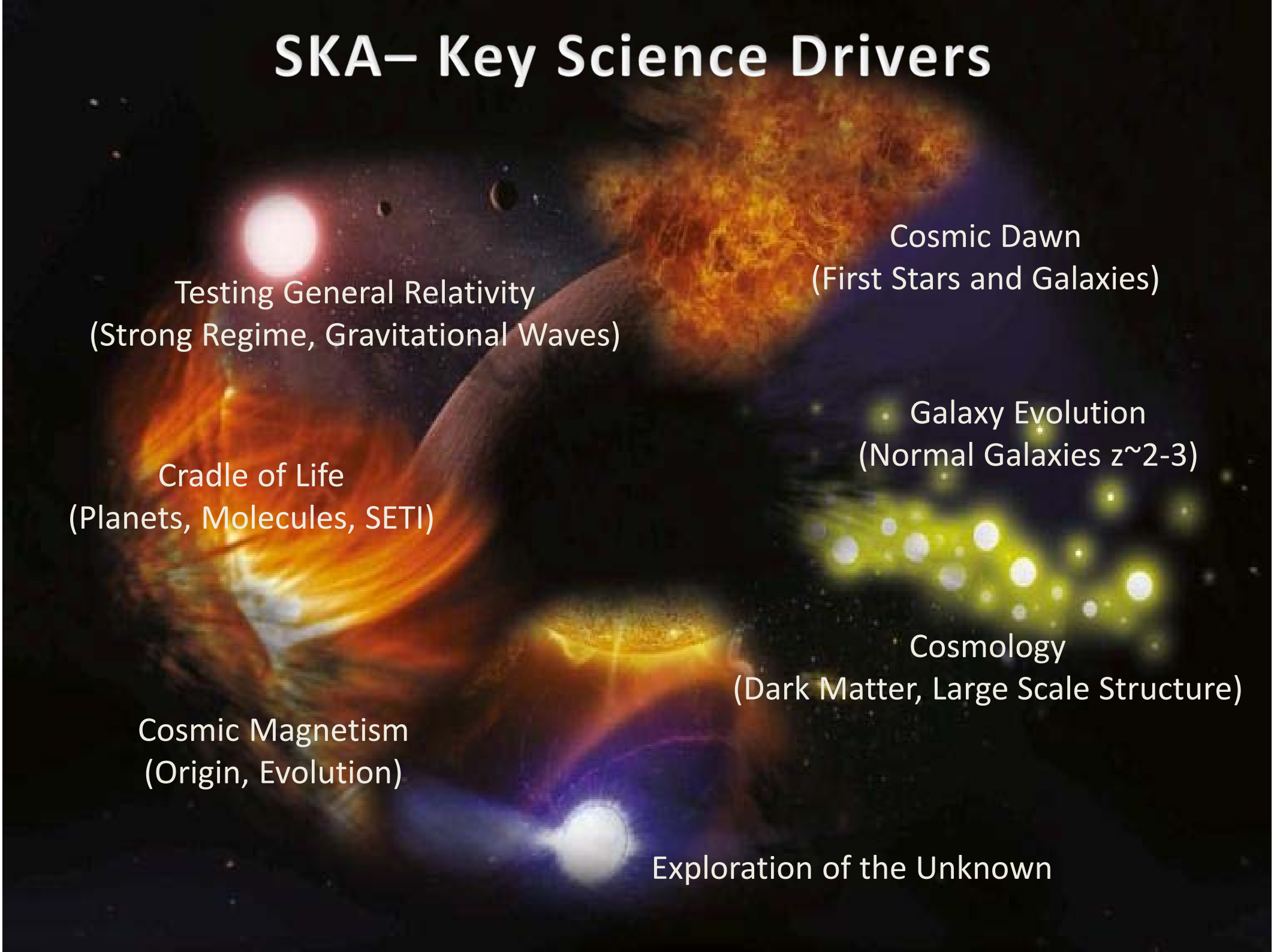
Gary Davis

2nd June 2016

Outline

1. Introduction to the SKA
2. Current status of the project
3. Things you might want to know
4. Final thoughts

SKA– Key Science Drivers



The Square Kilometre Array

One Observatory

Phase 1

Construction: 2018–2023

Construction cost: €650M

Operational cost: €70–100M/yr (TBC)

SKA1-LOW

50–350 MHz

~131,000 dipole antennas

max baseline 65km

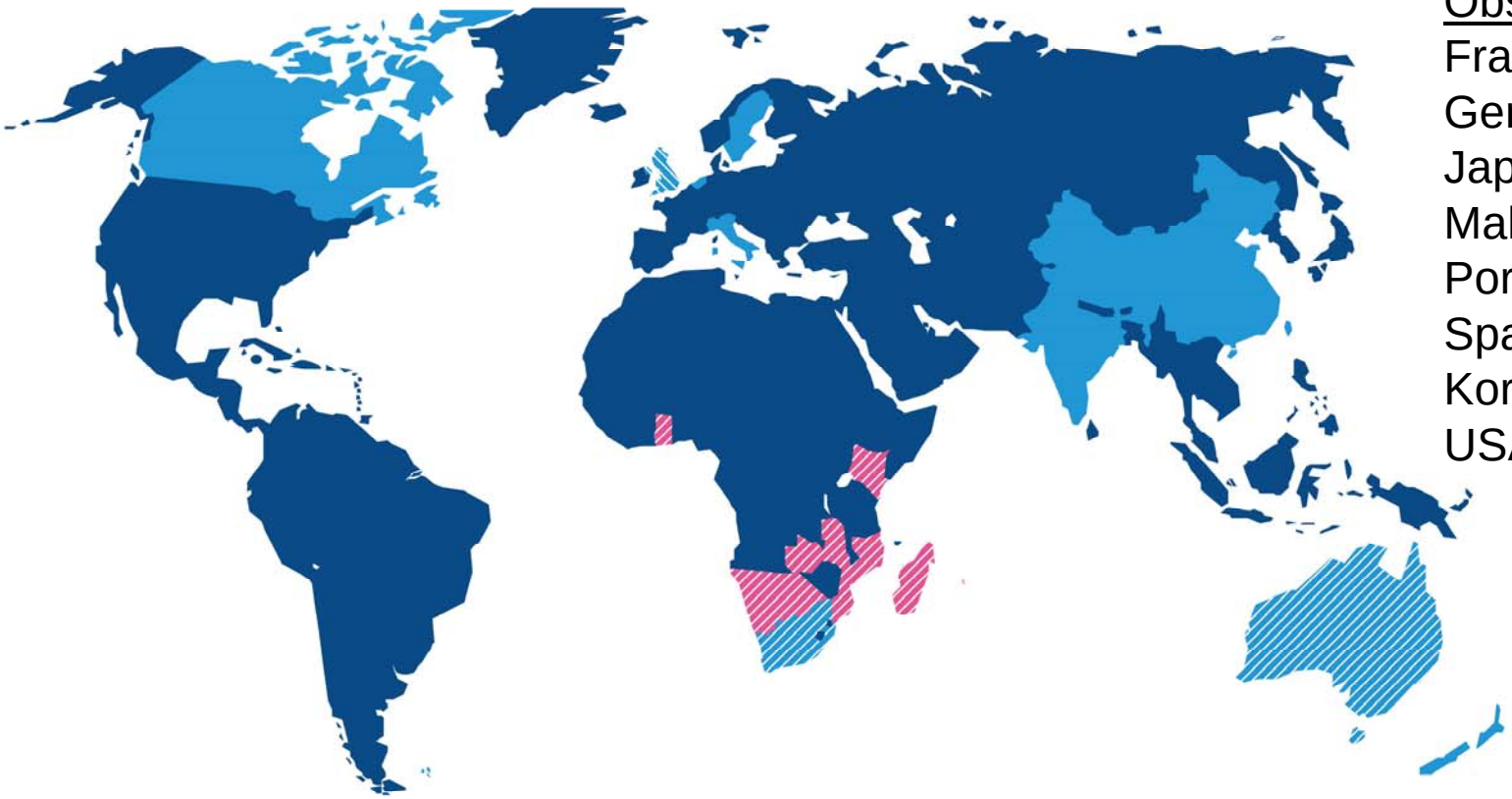
SKA1-MID

350 MHz – 13.8 GHz
197 dishes
5 receiver bands
max baseline 150km

A Global Collaboration

10 countries, more to join

Members:
Australia
Canada
China
India
Italy
Netherlands
New Zealand
South Africa
Sweden
UK



Observers:
France
Germany
Japan
Malta
Portugal
Spain
Korea
USA

Full members

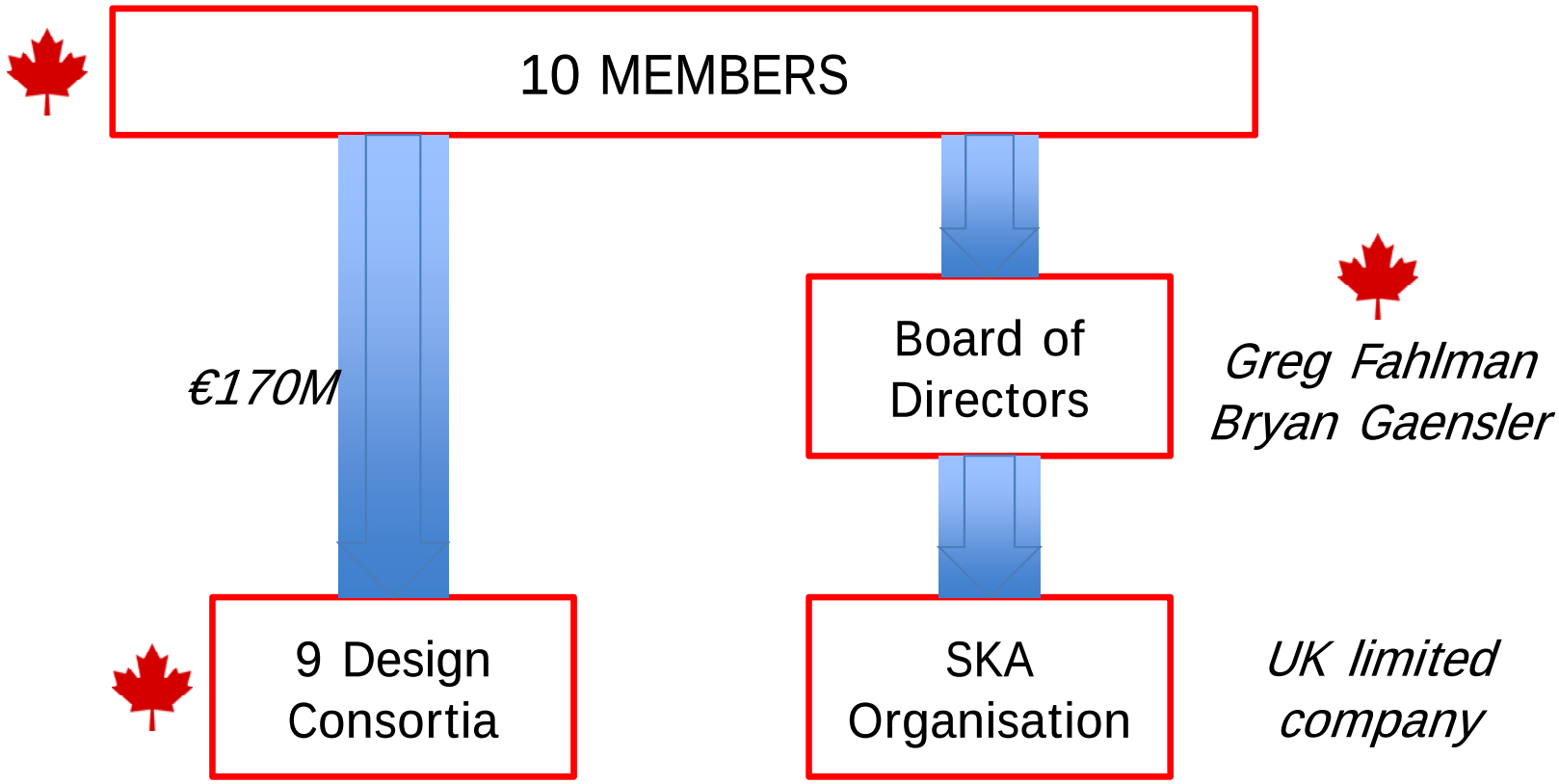
SKA Headquarters host country

SKA Phase 1 and Phase 2 host countries

African partner countries
(non-member SKA Phase 2 host countries)

This map is intended for reference only and is not meant to represent legal borders

Current Governance



Future Governance

- Governments are negotiating to set up the SKA Observatory as an Intergovernmental Organisation
- Rationale:
    - Scale of project
    - Political and financial stability
    - Independence and protection of investment
    - Privileges and Immunities
    - Freedom to Operate
- Timetable:
    - signature of convention by end-2016
    - ratification over following several months

Negotiation Meeting

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Key Milestones

System PDR	December 2016
System CDR	December 2017
Submission of construction proposal	January 2018
Commencement of construction	July 2018
Completion of construction	July 2023

(Schedule currently being re-worked for presentation to Board in July)

Key Issues

- Cost and scope
  - construction budget capped at €650M; but what can we deliver for that? won't know until CDR
  - operations budget being developed, but again won't be known until CDR
- Timing
  - pre-construction phase funded to end-2017
  - how to ensure smooth transition to SKA Observatory?
  - bridging arrangements needed – both funding and governance
  - evolving project schedule
- Impact of Maunakea and TMT 
- Who will represent Canada? 

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Operational Model

- One observatory, two telescopes
- Science programme
  - blend of Key Science Projects and PI projects
  - split TBD but maybe 70:30
  - ongoing series of community science meetings

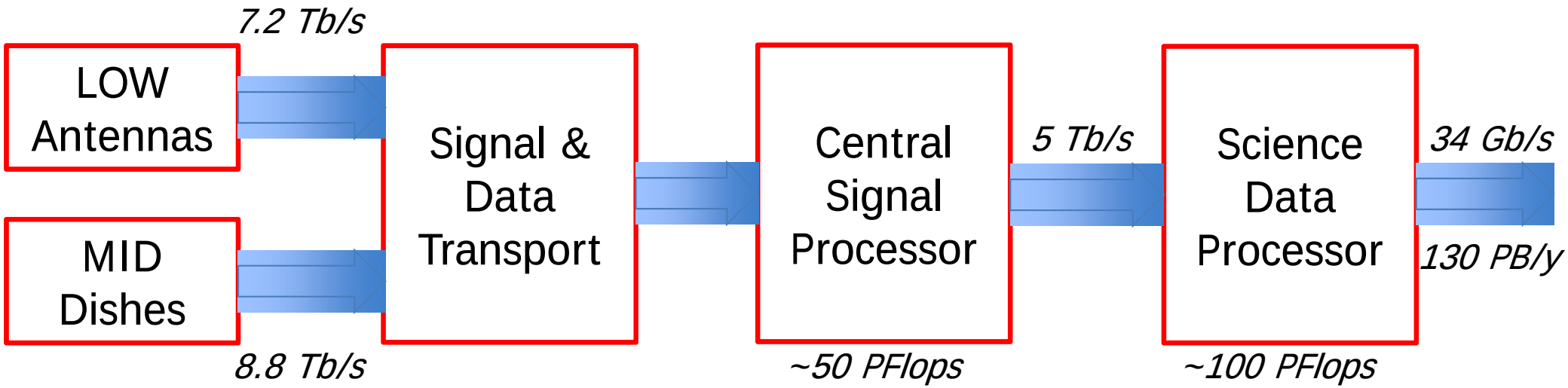
SKA 2016: Science for the SKA generation

Goa, India
7–11 Nov 2016

Access Principles

- Total allocated time to each country (KSPs and PI projects) to be proportional to share in the project
  - major change emerging from treaty negotiation process
  - countries can focus on one or the other
- A small amount of Open Time
  - for members and non-members on basis of merit
- Cap on access for non-members
- Data to be made openly available following a proprietary period

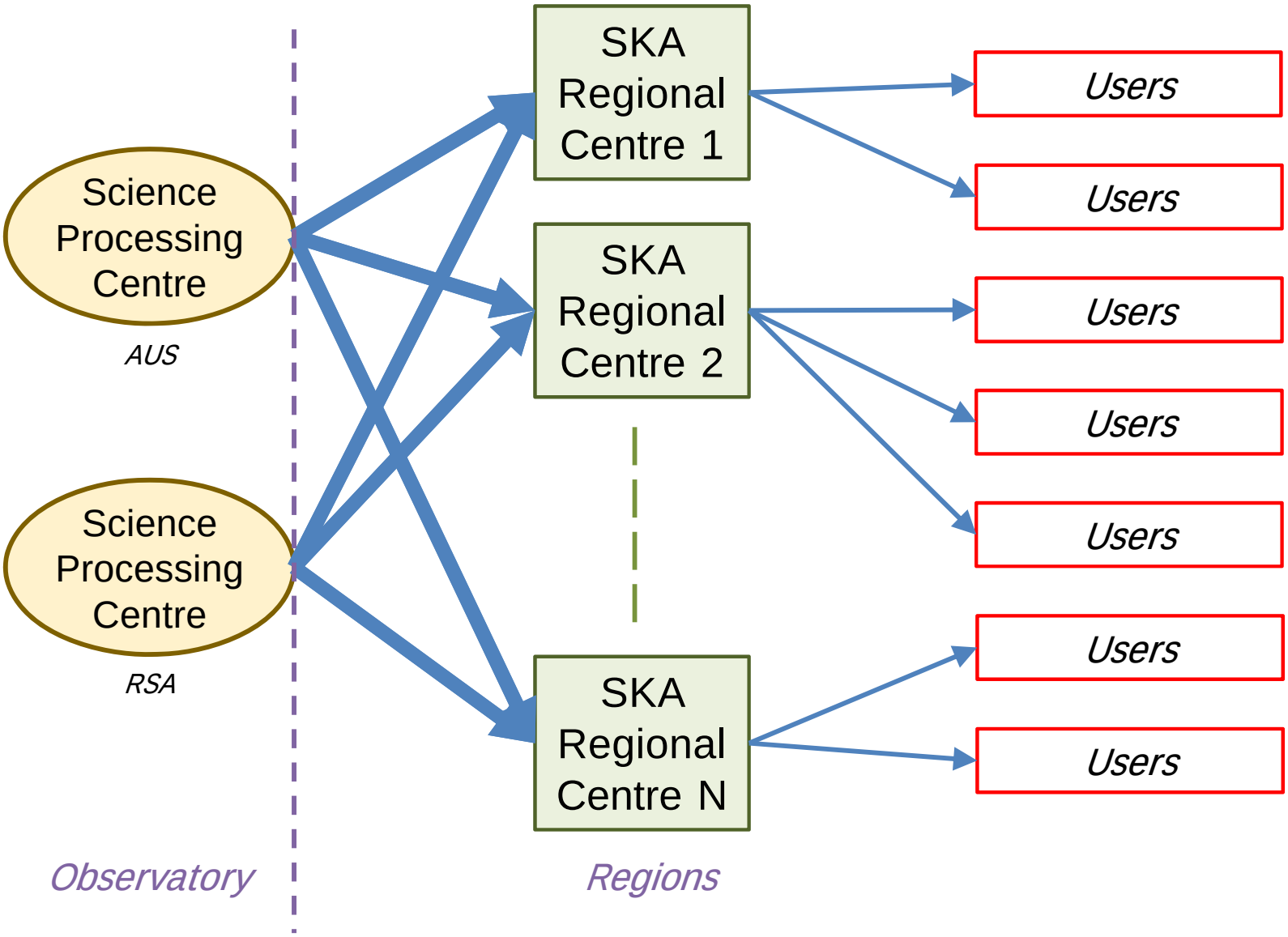
Data Flow



SKA data rate exceeds global internet traffic

Tianhe-2: world's fastest supercomputer

Data Flow


Science Processing Centre
AUS
Science Processing Centre
RSA
SKA Regional Centre 1
SKA Regional Centre 2
SKA Regional Centre N
Users
Users
Users
Users
Users
Users
Users
Observatory
Regions

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Things I Wish I Could Tell You…

- Will Canada be a Member or an Associate Member?
- What comes with Associate Membership?
- KSPs: proposal & time allocation process? timetable? membership rules?
- How is commensality actually going to work?
- Will there be Early Science before the full arrays are deployed?

Get Involved!

- Attend the SKA 2016 Science Meeting
- Join a Science Working Group
- Join Bryan's mailing list
- Think about setting up an SKA Regional Centre in Canada
    - appoint a representative to the SRC Coordination Group

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www.skatelescope.org