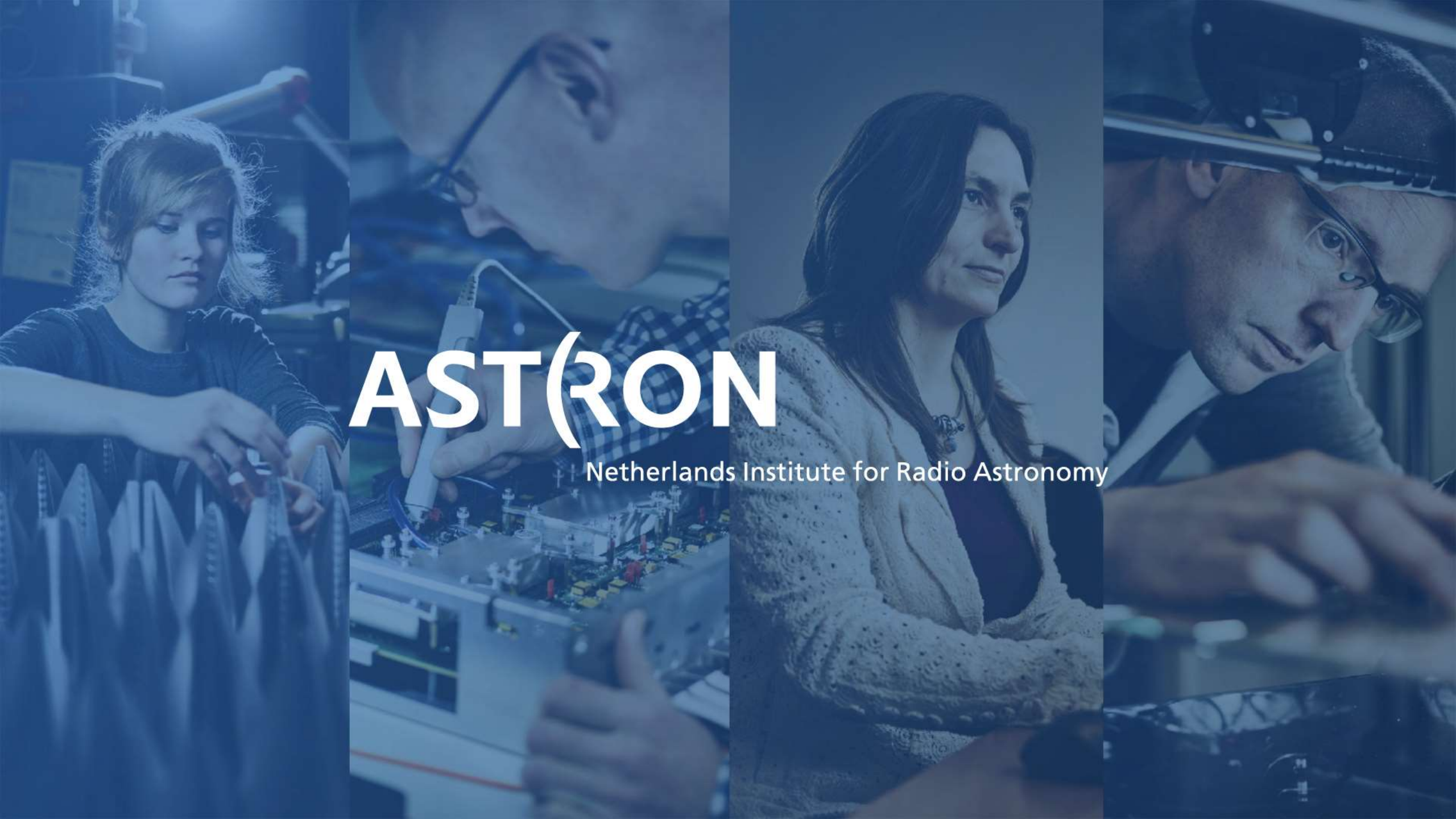
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Netherlands Institute for Radio Astronomy

The ASTRON Science Data Centre

Yan Grange, Zheng Meyer-Zhao, Michiel van Haarlem

NL-RSE19

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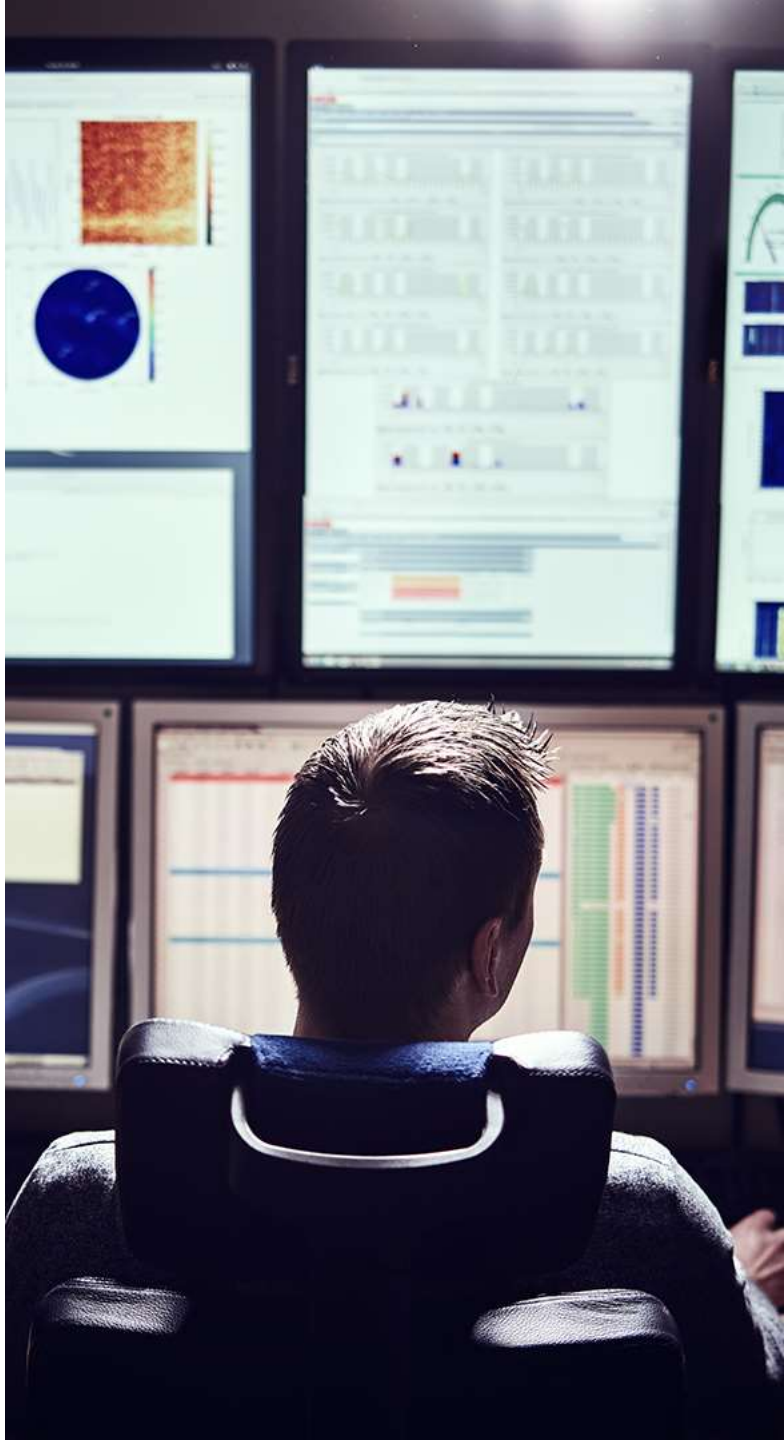

Radio astronomy – instruments

DRT (1956)
(opened by the Dutch queen)

WSRT (1970)
(opened by the Dutch queen)

LOFAR (2010)
(opened by the Dutch queen)

Metal → **Software**

SKA SQUARE KILOMETRE ARRAY

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LOFAR

LOFAR

- 38 Dutch stations (144 antennas each)
- 13 International stations (192 antennas each)
- (2 more coming; Latvia and Italy)

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LOFAR

Challenges for LOFAR

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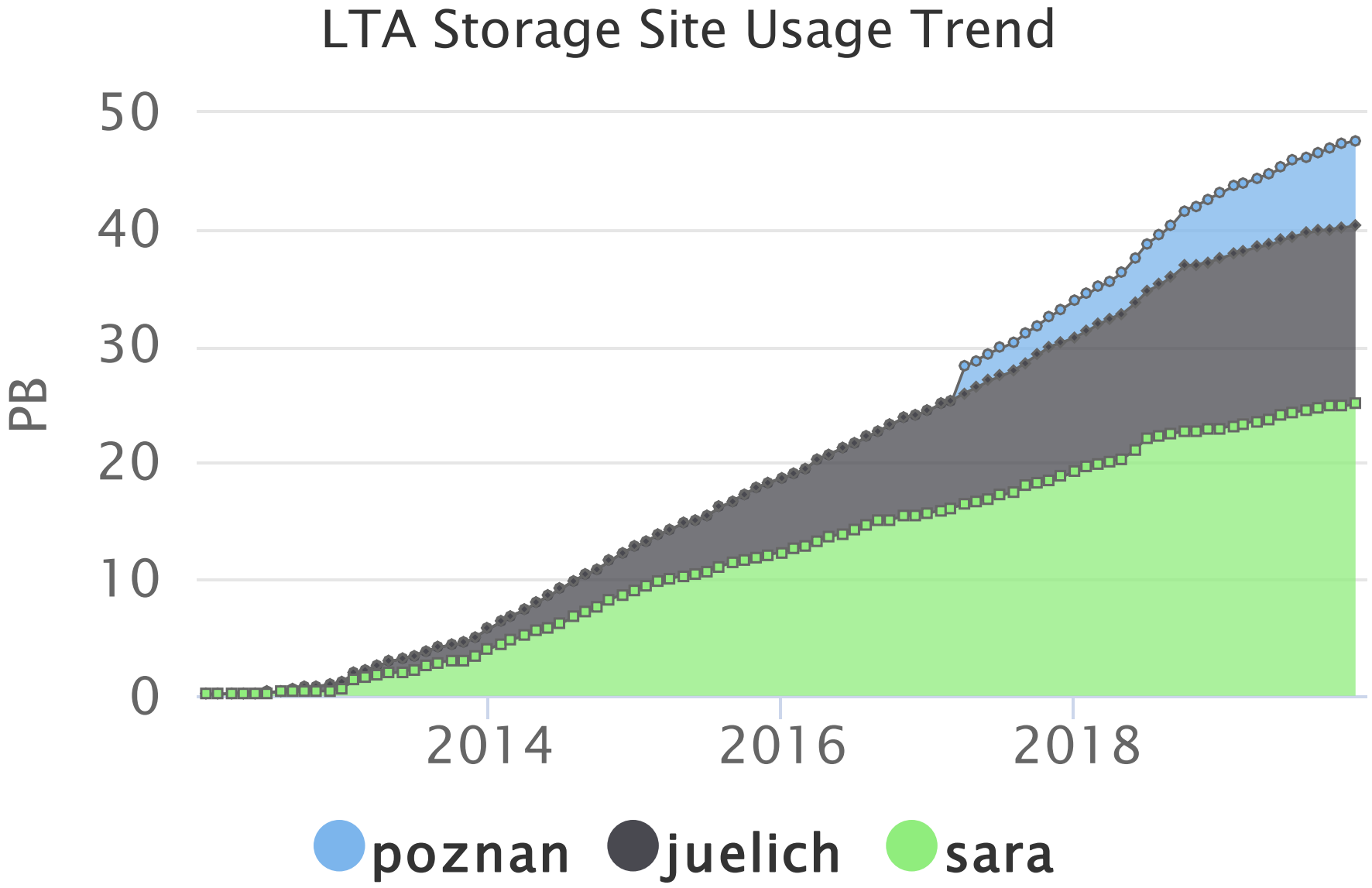
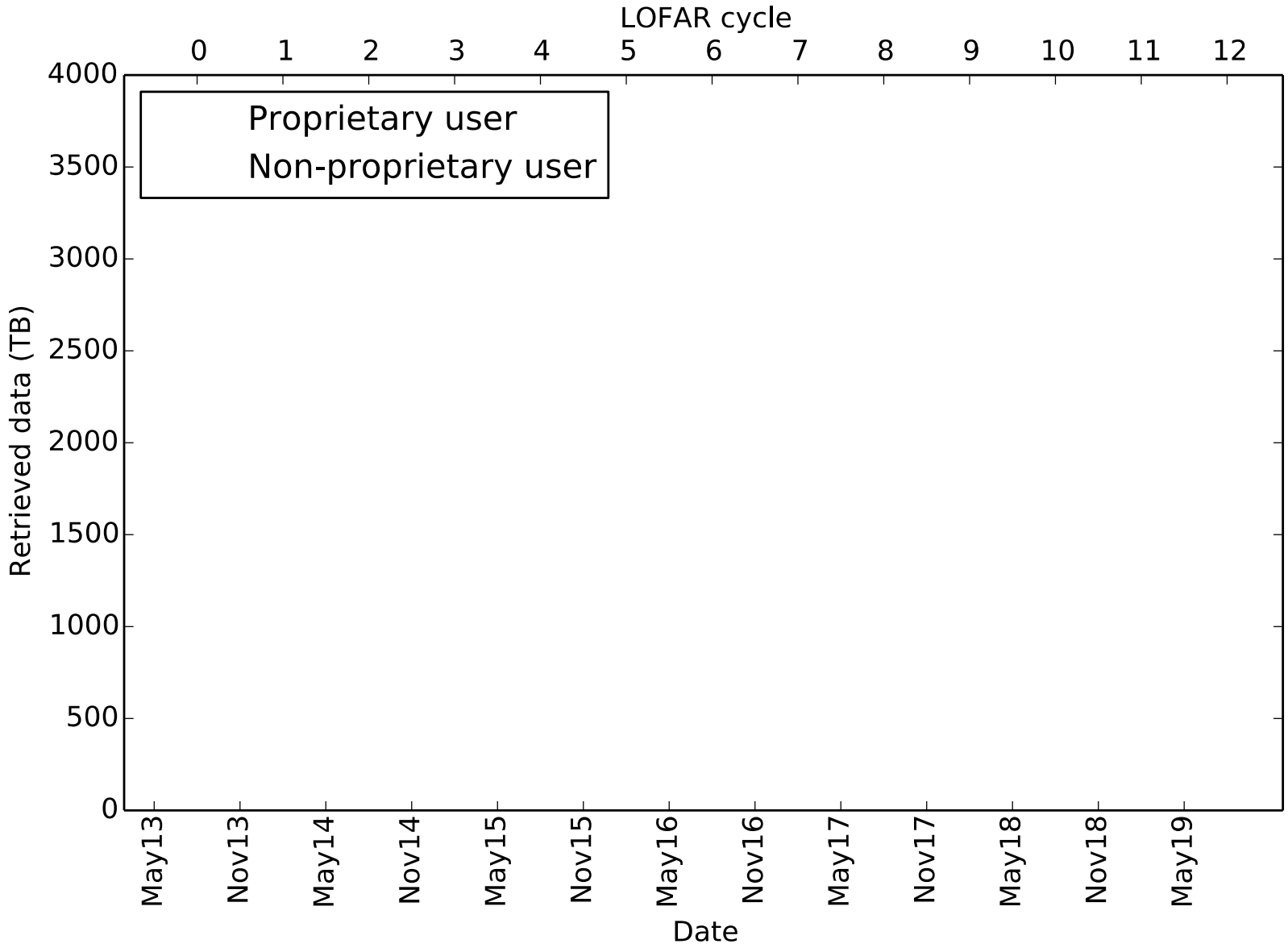
LOFAR

Challenges for LOFAR (apart from nature)

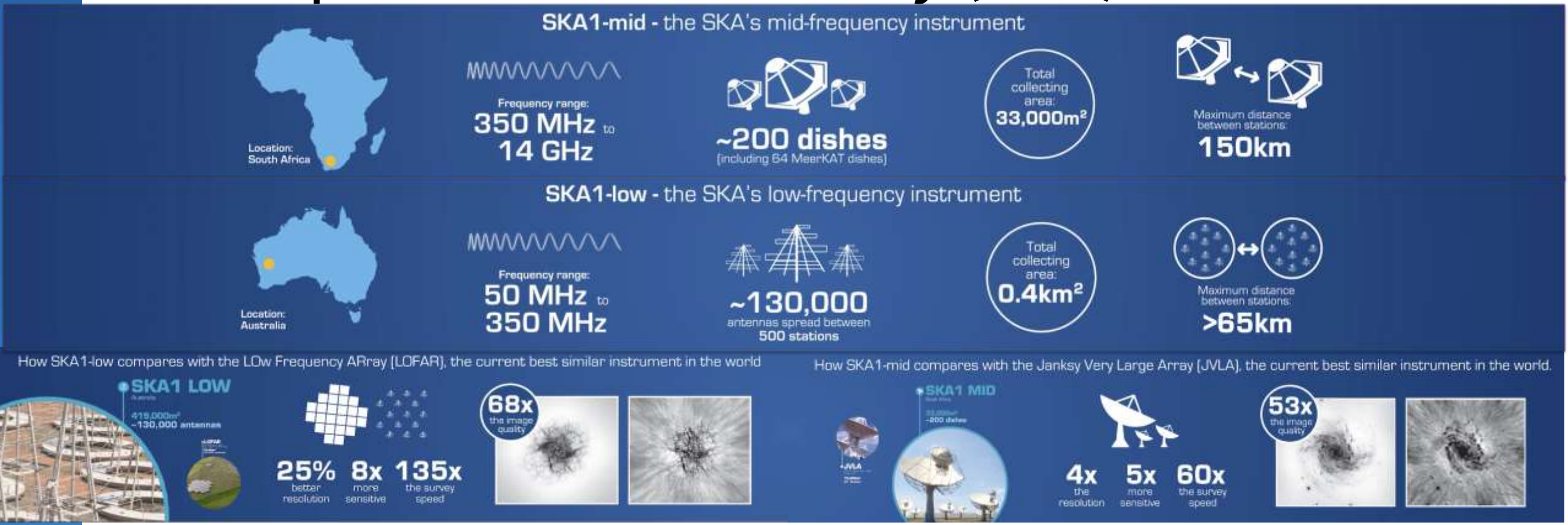


LOFAR



Factor **> 10** between PI and non-PI downloads

The Square Kilometre Array (SKA)



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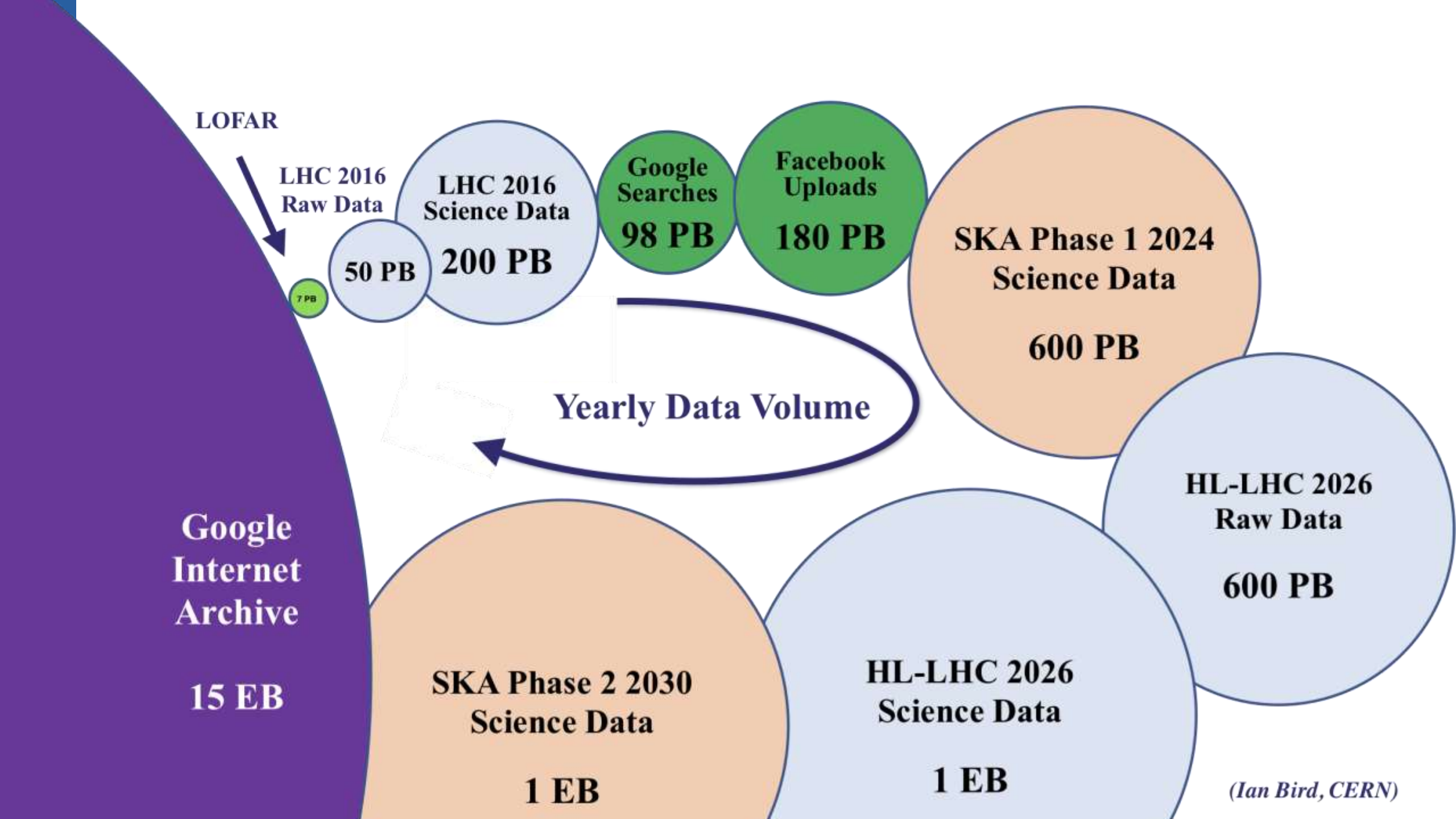
LOFAR
LHC 2016 Raw Data
7 PB
50 PB
LHC 2016 Science Data
200 PB
Google Searches
98 PB
Facebook Uploads
180 PB
SKA Phase 1 2024 Science Data
600 PB
Yearly Data Volume
HL-LHC 2026 Raw Data
600 PB
Google Internet Archive
15 EB
SKA Phase 2 2030 Science Data
1 EB
HL-LHC 2026 Science Data
1 EB
(Ian Bird, CERN)

Processing radio data

?

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Challenges for modern radio astronomy

- Software is hard to obtain and install
- Data is too large to process on own system
  - Users need to be helped
- Astronomers (think they are) tech-savvy
  - This is a Good thing! (but also very hacky user code)
  - Higher threshold
- Published data sets are hard to find and obtain
- Data formats are specific to radio astronomy
- Astronomers do not like throwing away (raw) data

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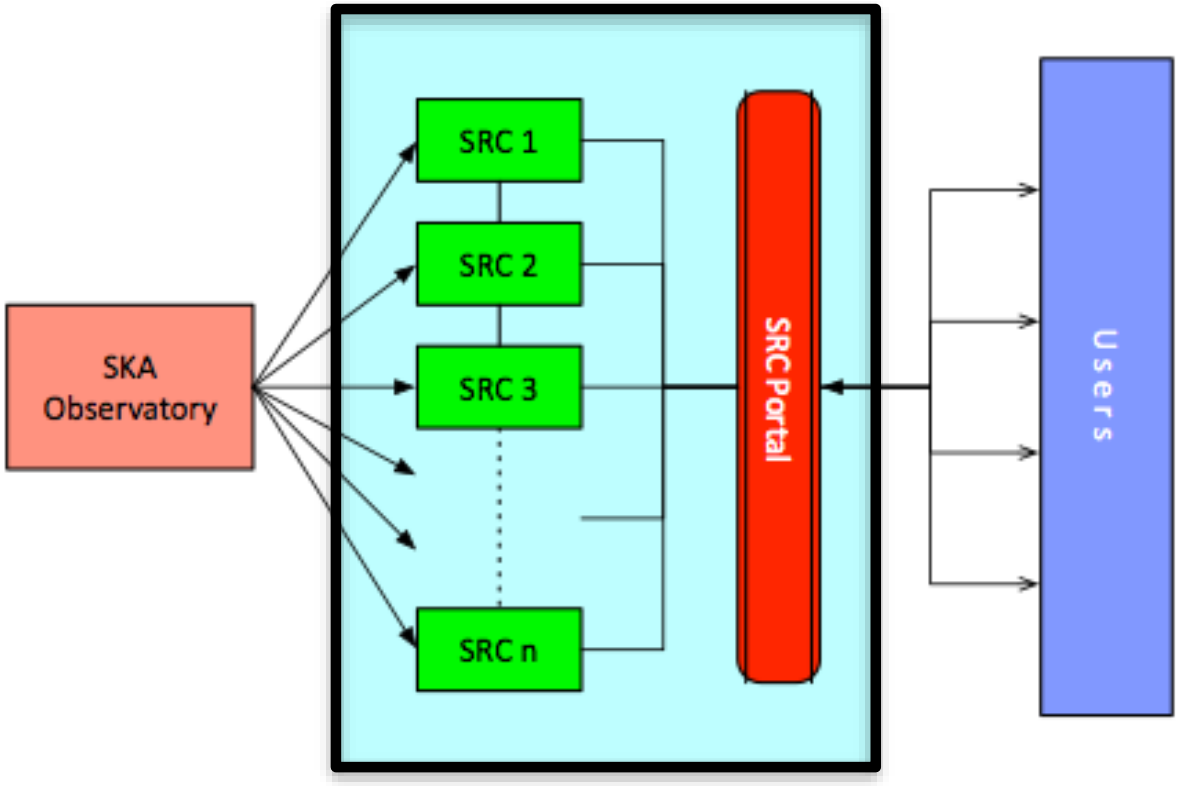
SKA Regional Centres (SRCs)

- SKA Regional Centres (SRCs) will host the SKA science archive
- Provide access and distribute data products to users
- Provide access to compute and storage resources
- Provide analysis capabilities
- Provide user support
- Multiple regional SRCs, locally resourced and staffed



Primary interface for SKA data analysis

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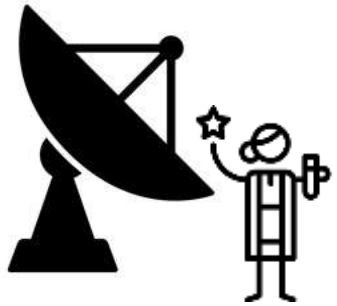
ASTRON Science Data Centre (SDC)



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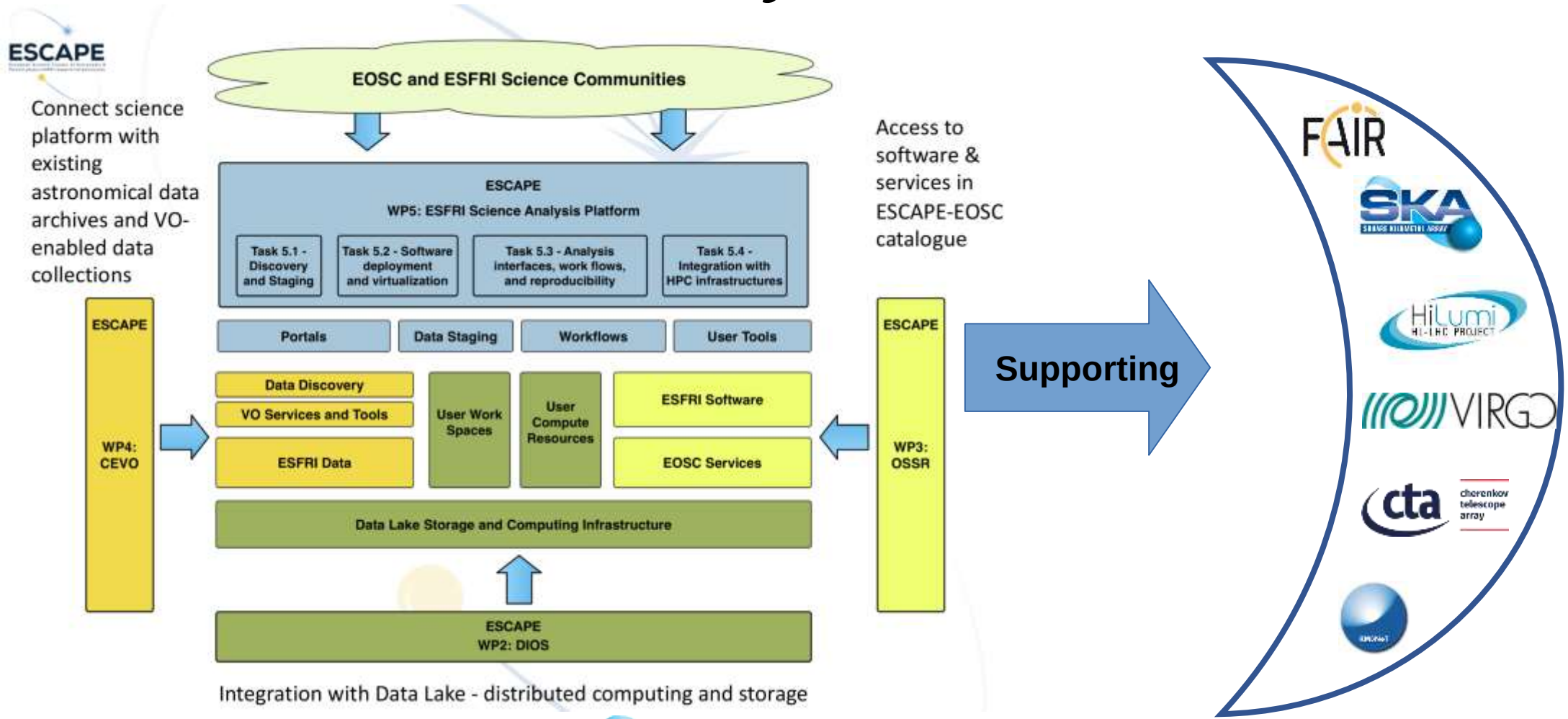
ESCAPE Science Analysis Platform



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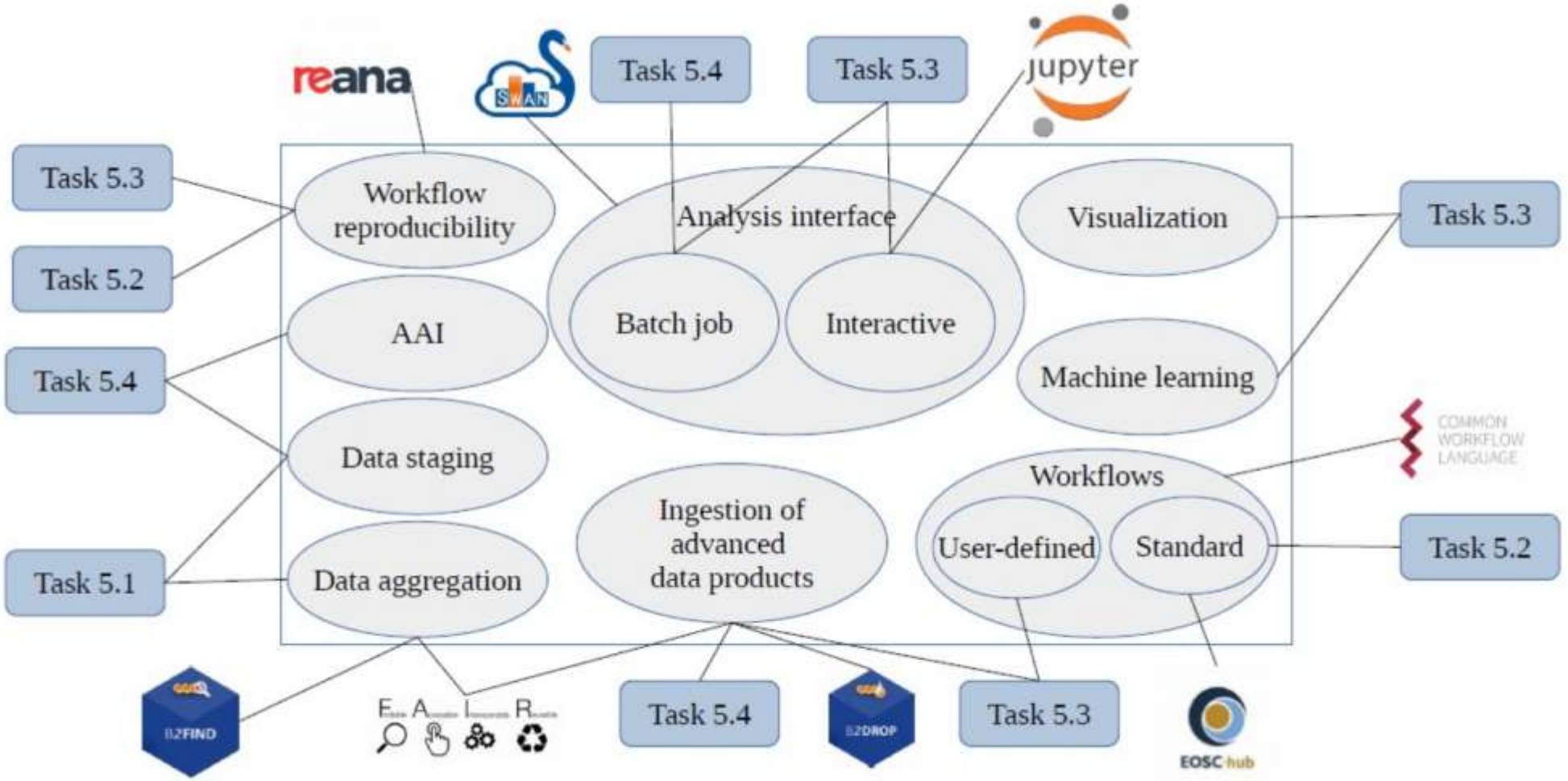
Links to existing technology



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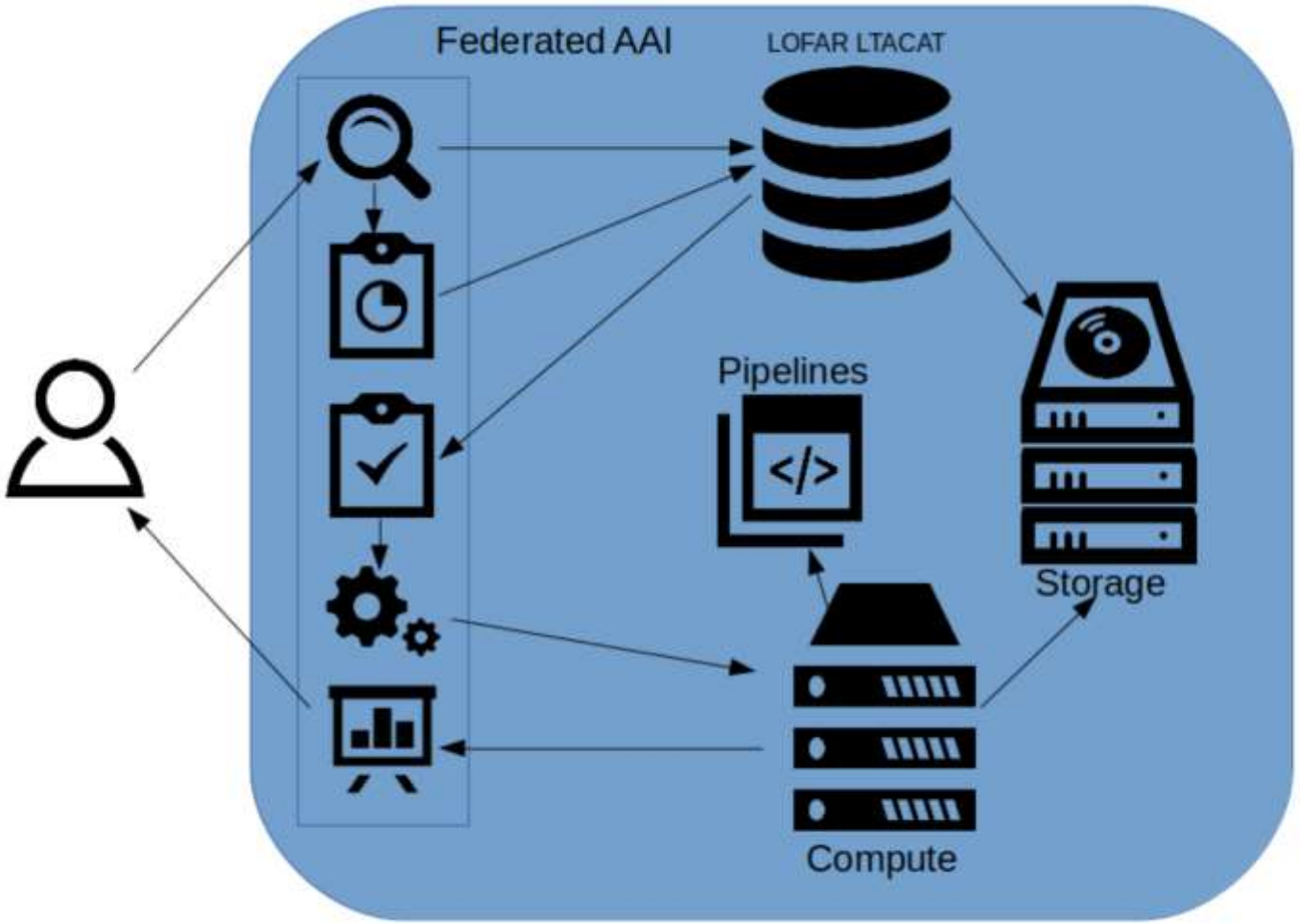
“Minimal Viable Product”



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Questions


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