Aperture Array MID Consortium: AAMID

of the

Mid Frequency Aperture Array Element

All-Hands Meeting
1-3rd April 2014

Jan Geralt Bij de Vaate

Agenda Tuesday

1-April	ASTRON Auditorium
13.00	Registration
13.30	Welcome
13.35	Goals of the meeting
	Introductions
	MFAA Overview
14.30	AAMID Governance, Risk
14.50	AAMID Management
15.00	Tea break
15.30	SKA (2)
15.50	MFAA Systems Engineer
16.20	MFAA System Design
16.40	Discussion
17.00	Close day1
18.00	Dinner

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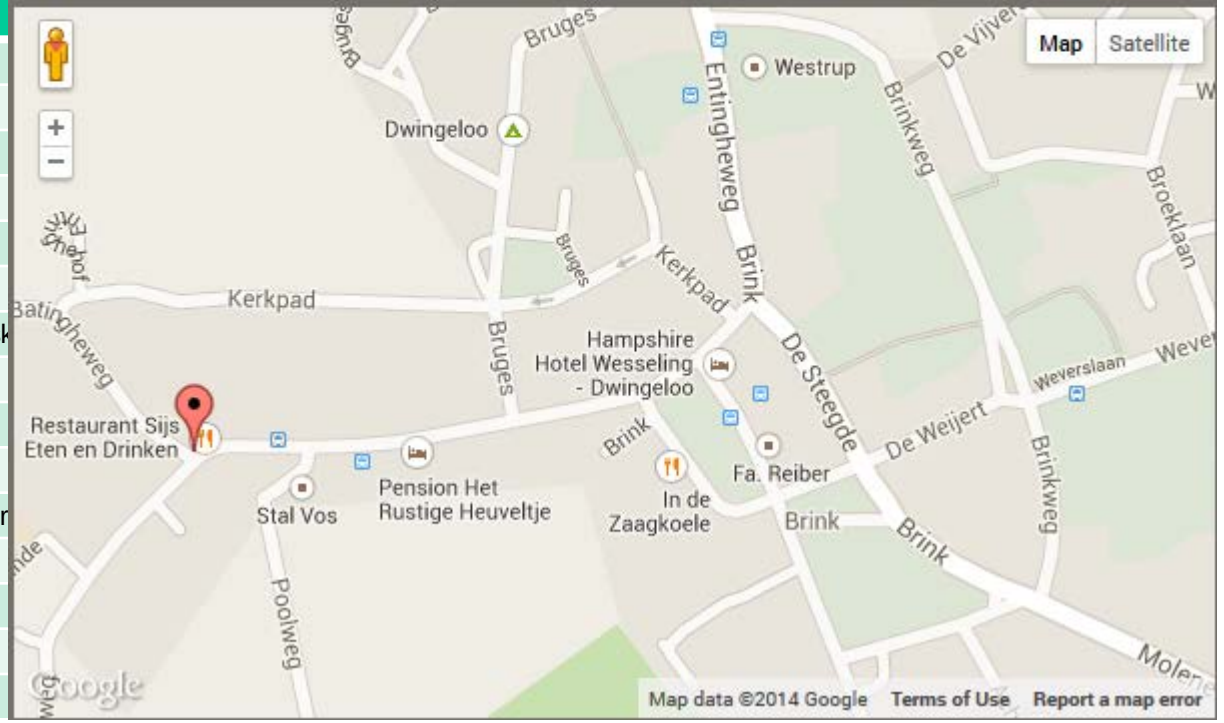


With ASTRON colleagues to Restaurant Sijs, Dwingeloo

Agenda Wednesday

2-April	ASTRON Auditorium	
9.00	SKA2 Science Req	Jeff Wagg
9.30	AERAP / MFAA Stellenbosch workshop	Ilse van Bemmel
10.00	EMBRACE	Steve Torchinsky
10.30	Coffee break	
11.00	MITRA	Girish Beeharry
11.20	Front-end Design pt1	David Zhang (Fiorelli, Beltran, Gilmore, KLAASA, Witvers)
12.30	Lunch	
13.30	Front-end Design pt2	David Zhang
14.00	Receiver	Guy Kenfack (+Gauffre)
15.00	Tea break	
15.30	Array Proto Types	Pieter Benthem (+vd Brink, Drost)
	Wrap-up, discussion	
18.00	Close day2	

Agenda Thursday

3-April	ASTRON Oort Room	
9.00	AAMID MT management meeting	By invitation, MT members
10.30	Coffee break	
11.00	AAMID progress meeting	By invitation, MT members + SKAO
12.30	Adjourn	

Internet via ‘wiguest’
Marchel Gerbers to collect all presentation
To appear on Alfresco

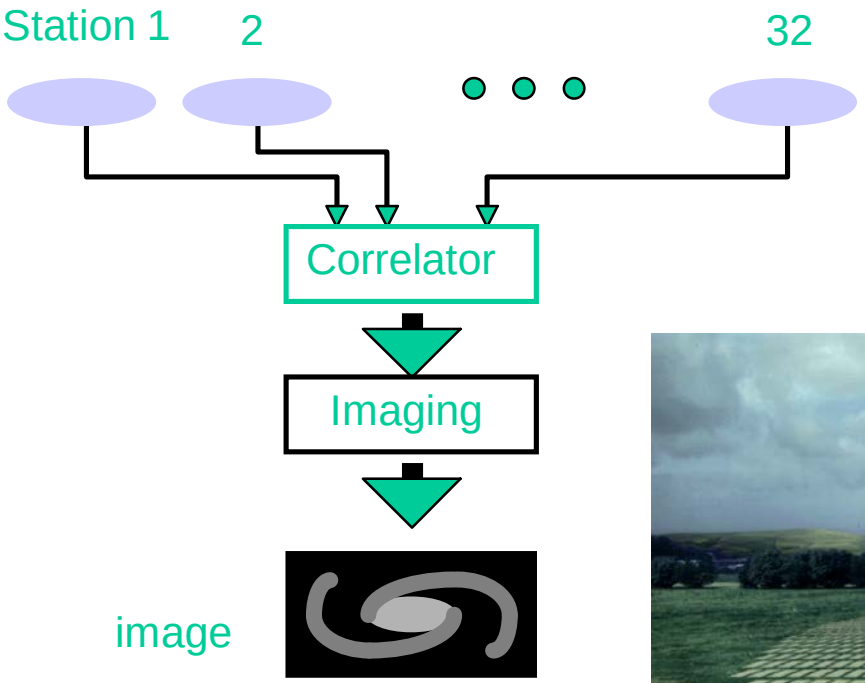
How SKA started…

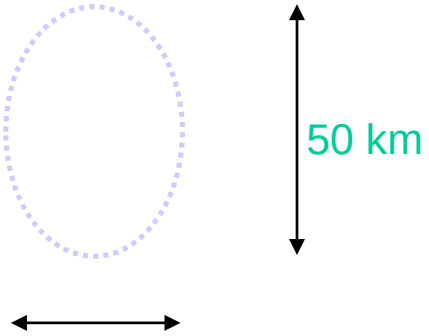
- Competing claims, but

Design aspects of a Tile Telescope
A possible approach to a
Square Km Array Interferometer (SKAI)

- **Array configuration:** 2-dimensional, maximum baseline 50 km, in 2 directions. (NB: in this paper we will assume an array of 100 'telescopes', each with the equivalent collecting area of a 100m dish)
- **Frequency range:** 150-1500 MHz (wavelength 200-20 cm): a full decade
- **Instantaneous bandwith:** 100 MHz?
- **Frequency resolution:** 0.1 MHz?
- **Preferred hemisphere/latitude:** Operations: North, 52 degr. Scientifically? Interference?
- **Sky coverage:** At least 45 degr from zenith in all directions.
- **Cost envelope:** 200 Million US$ (probably).
- **Time resolution:** Better than a msec (pulsars)
- **Multi-beam capacity:** Yes. Very important. Nr of beams traded off against channels and/or polarisation.

SKA system concept

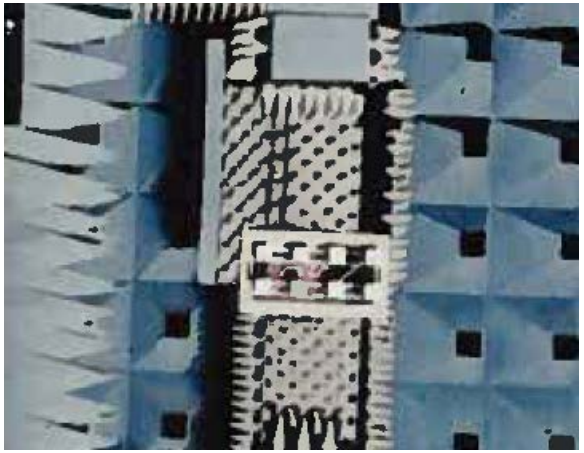


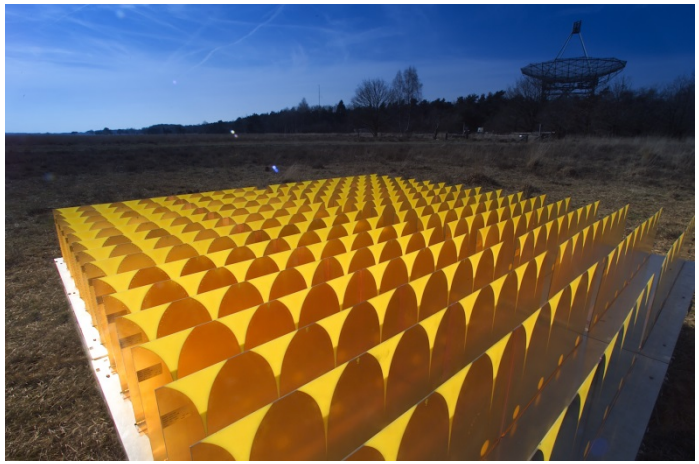


Sept 2000

MFAA, history

- Adaptive Array Demonstrator: 2x4 elements (1996)
- One Square Meter Array (1998)
- Thousand Element Array (2000)
  - First All sky 24 hour observation

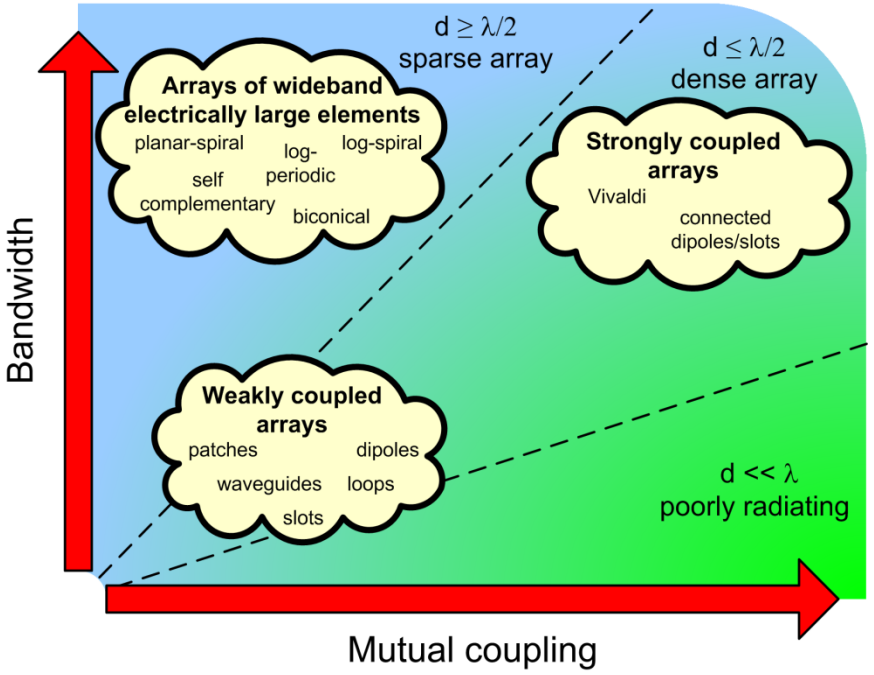


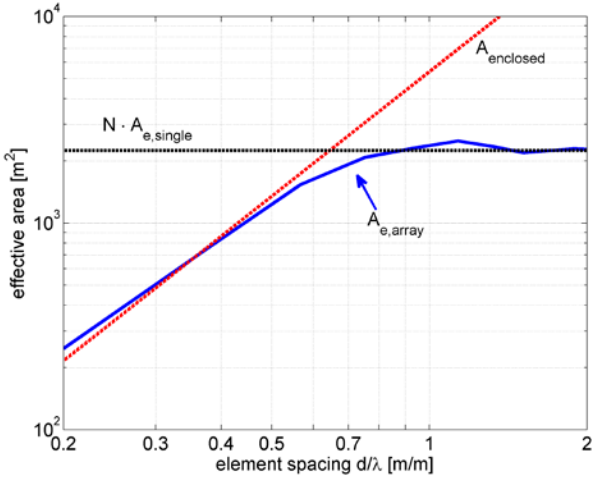


- EMBRACE (2010)
  - FLOTT, 2PAD,

Dense or Smart?

- MFAA=Dense?





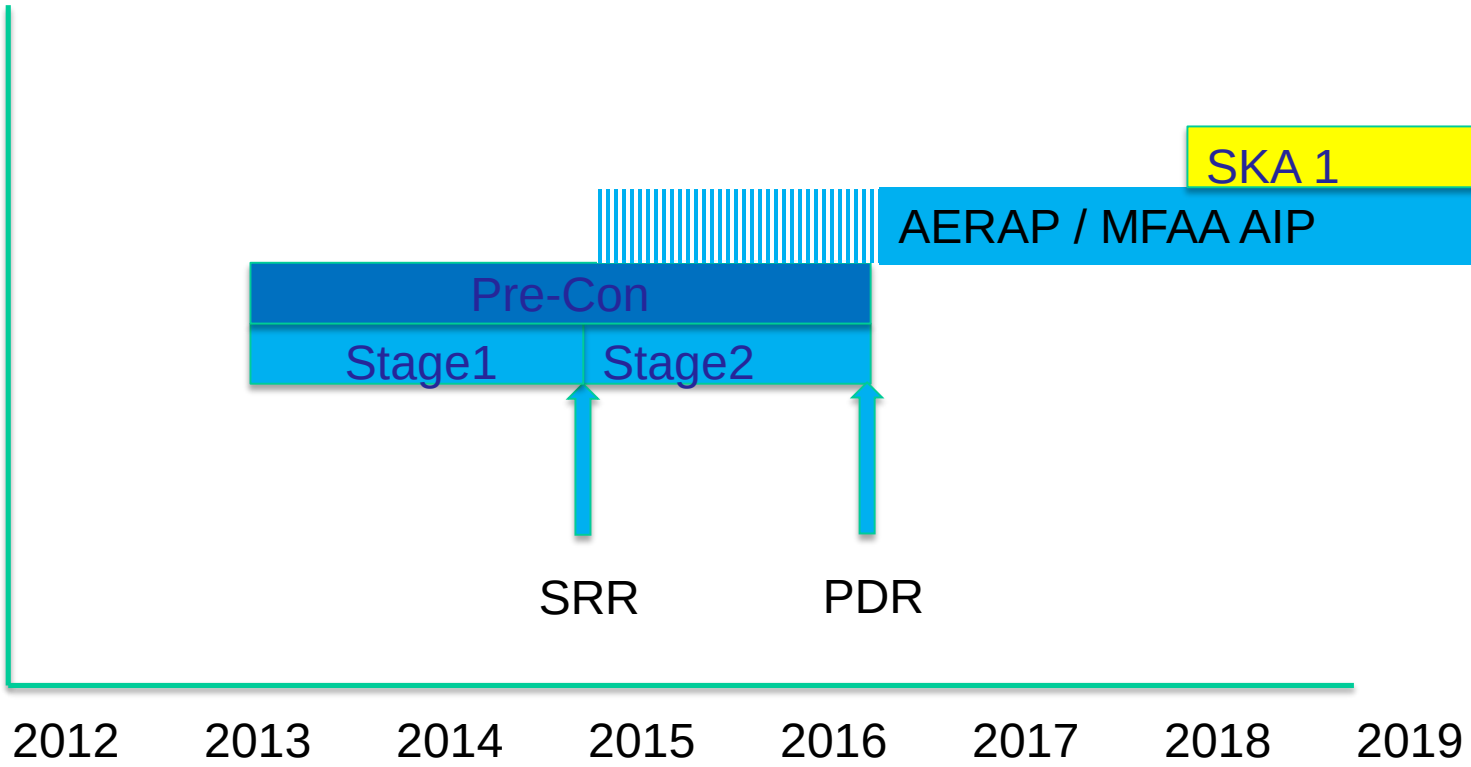
Frequency Band

- 350 – 1000MHz ?
- 450 – 1450 MHz ? (500-1500)

All-hands Goals

- Detailed work plans for all tasks
- Understanding of goals and deliverables
- Understanding of SKAO and AAMID processes
- Design status

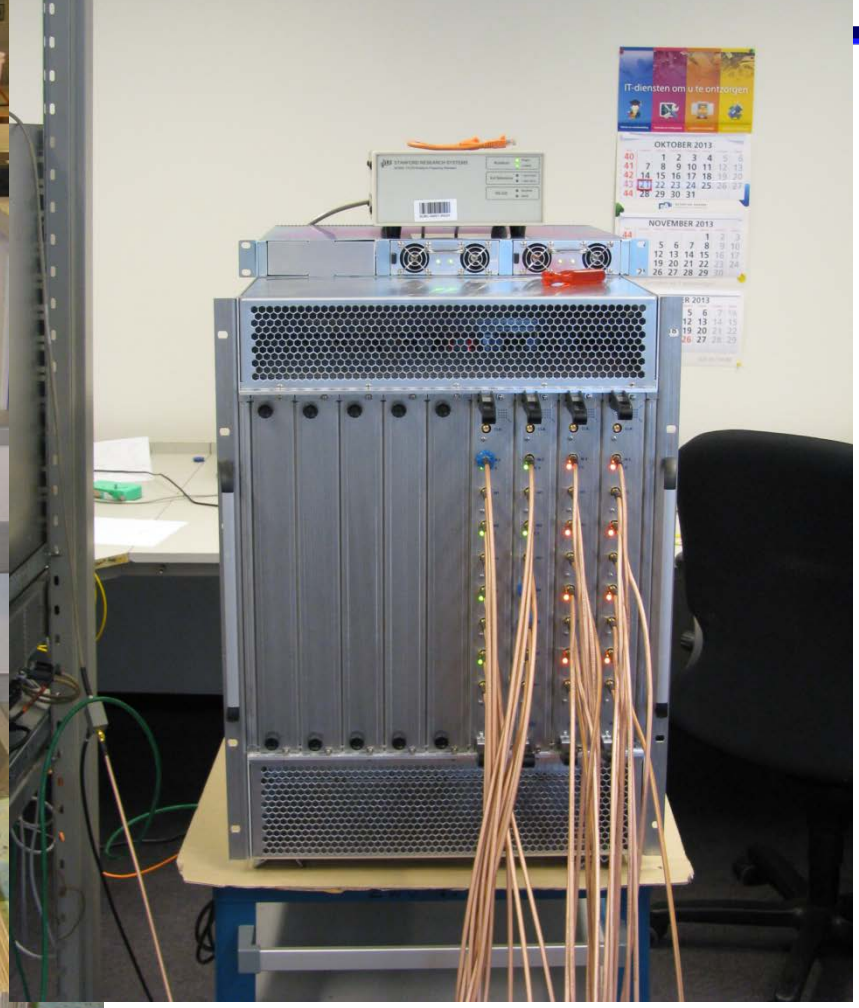
MFAA Schedule



Consortium

- The AAMID has the full set of required experience
- Staff in place, ready to go

- 3Ds: documentation, documentation and documentation



Site, array design

UNIBOARD

– *Mauritius*

array demonstration

Focus on Front-end, LFAA will work on Digital Signal Processing

AAMID management team

- CL, PM, PE, PS, QAM and Task Leaders
  - Monthly telecons
  - ASTRON is gaining experience with Vidyo: www.vidyo.com/

Role	Level 4 Responsibility	Proposed	Affiliation
Consortium leader	SKA.TEL.MFAA	Jan Geralt Bij de Vaate	ASTRON
Project Manager		Andre van Es	ASTRON
Project Engineer		Andrew Faulkner	UCAM
Project Scientist		Steve Torchinsky	OBSP
PA/PQ Manager		Marchel Gerbers	ASTRON
Taks Leader	SKA.TEL.MFAA.SE	Andre Gunst	ASTRON
Task Leader	SKA.TEL.MFAA.FED	David Zhang	UMAN
Task Leader	SKA.TEL.MFAA.RE	Guy Kenfack	OBSP
Task Leader	SKA.TEL.MFAA.SP	Kris Zarb-Adami	Malta
Task Leader	SKA.TEL.MFAA.PROT	Pieter Benthem	ASTRON

Task Leaders

- Collect, review and submit information on the progress of the task
- Prepare meetings, propose decisions and chair the meetings for the task
- Monitor and execute the implementation of decisions taken of the MT

Task Leaders [2]

- To prepare a plan to be presented and discussed at the All-hands meeting:
  - Focus on 2 years
  - Resources, when, who
  - Intermediate deliverables
  - Budget
  - (draft) Level 3 requirements

Negotations with SKA Office

3 Milestones and Deliverables with Associated Costs

The following milestones and deliverables with the associated costs for stage 1 and stage 2 of the MFAA Element.

	Date	Nominal date	Deliverable	Earned Value
1.	T0	1st Nov 2013	Bid preparation and OSKAO delivery of Level 1 requirements	€0,5M
2.	T0+2 years	1st Nov 2015	System Requirements Review and associated documents (see SEP)	€4,0M
3.	T0+3 years	1st Nov 2016	Preliminary Design Review and associated documents (see SEP)	€1,9M
4.	Continues	Monthly	Monthly Progress meetings (36 in total)	€3,6M
		Total		**€10M**

Table 1: Cost table

- *Not the full list of deliverables*
- *Earned value has no meaning*

Deliverables, Management plan

Proposed Deliverables		Input from
TRL5	Technology description	SKA.TEL.MFAA.SE SKA.TEL.MFAA.SE.ARC
	Technology readiness report	SKA.TEL.MFAA.SE SKA.TEL.MFAA.SE.FA SKA.TEL.MFAA.SE.RAM SKA.TEL.MFAA.SE.CAL SKA.TEL.MFAA.SE.MOD SKA.TEL.MFAA.PROT.EMB
SRR	MFAA System Requirements Specifications 1.0 MFAA Architectural Design Document	SKA.TEL.MFAA.SE.RS SKA.TEL.MFAA.SE.ARC SKA.TEL.MFAA.SE.ACF SKA.TEL.MFAA.SE.CLK SKA.TEL.MFAA.SE.FA SKA.TEL.MFAA.SE.MOD SKA.TEL.MFAA.SE.CAL SKA.TEL.MFAA.SE.SDA
	MFAA Strategy to Proceed to PDR phase MFAA Implementation Estimations (cost, power, schedule,	SKA.TEL.MFAA.MGT SKA.TEL.MFAA.SE SKA.TEL.MFAA.SE.RAM SKA.TEL.MFAA.FED SKA.TEL.MFAA.RE SKA.TEL.MFAA.SP SKA.TEL.MFAA.PROT
PDR	MFAA System Requirements Specifications 2.0 MFAA Architectural Design Document	SKA.TEL.MFAA.SE.SRS SKA.TEL.MFAA.SE.ARC SKA.TEL.MFAA.SE.ACF SKA.TEL.MFAA.SE.CLK SKA.TEL.MFAA.SE.FA SKA.TEL.MFAA.SE.MOD SKA.TEL.MFAA.SE.CAL SKA.TEL.MFAA.SE.SDA
	MFAA Strategy to Proceed to CDR phase MFAA Implementation Estimations (cost, power, schedule,	SKA.TEL.MFAA.MGT SKA.TEL.MFAA.SE SKA.TEL.MFAA.SE.RAM SKA.TEL.MFAA.FED SKA.TEL.MFAA.RE

Conclusion

- SKA = MFAA
  - ‘Just’ need to prove it!