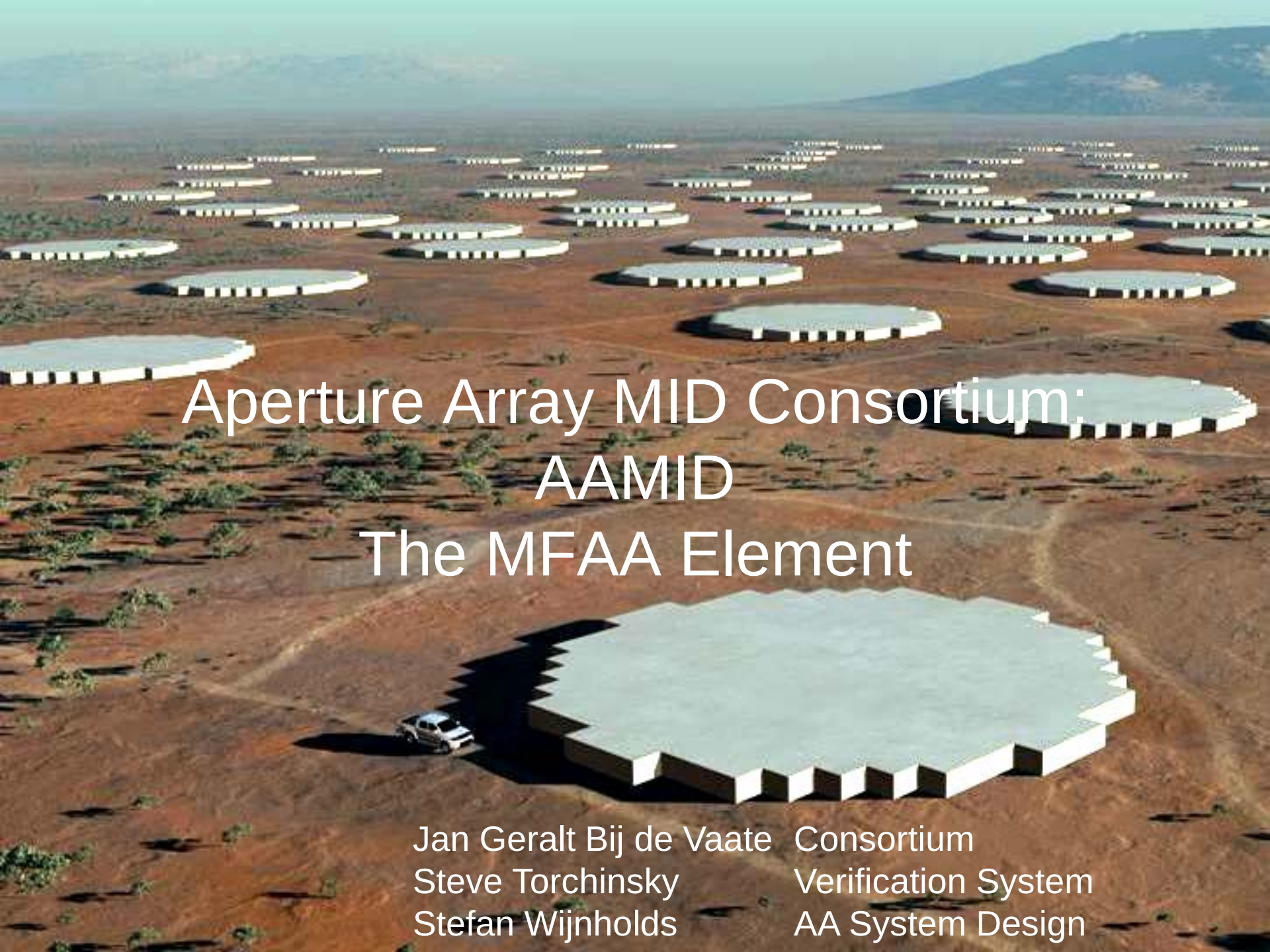


Aperture Array MID Consortium: AAMID
The MFAA Element

Jan Geralt Bij de Vaate — Consortium
Steve Torchinsky — Verification System
Stefan Wijnholds — AA System Design

Why MFAA?

- DRM 1.0, for SKA2, Survey Requirement
  - Speed 10^{10} $m^4 deg^2/K^2$
  - Large FoV 100 deg^2
  - Freq 350-1450 MHz
- Processing advantages
- DRM -> System requirements for SKA2 ?

Consortium

1. ASTRON	*Management, System, Prototyping*
2. Observatoire d'Paris	*Front-end Chips*
3. University of Bordeaux	*ADC*
4. University of Cambridge	*System*
5. University of Manchester	*ORA*
6. KLAASA (China)	*Industrial design, Prototyping*

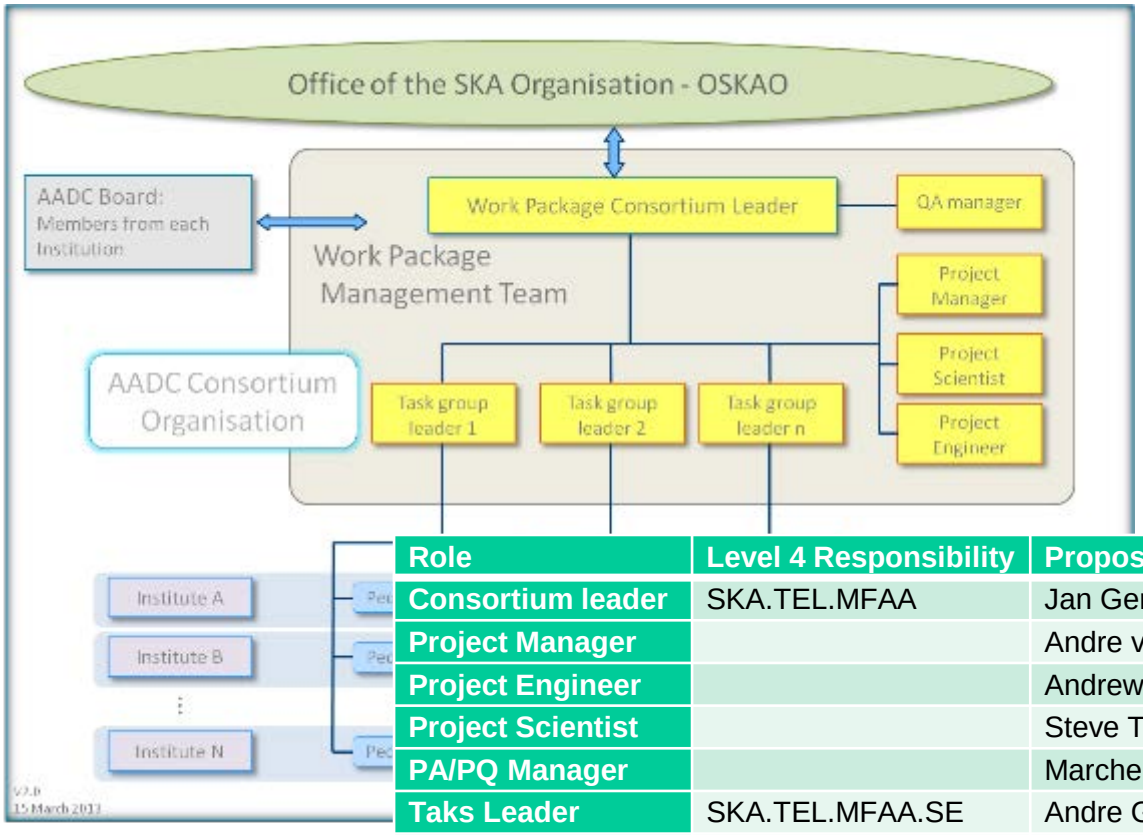
7. Associate members:

– *Portugal, IT*	*Renewable energy, RFoF*
– *University of Malta*	
– *South Africa*	*Site*

Focus on Front-end

LFAA knowledge / development will be used for Digital Signal Processing

Consortium organogram



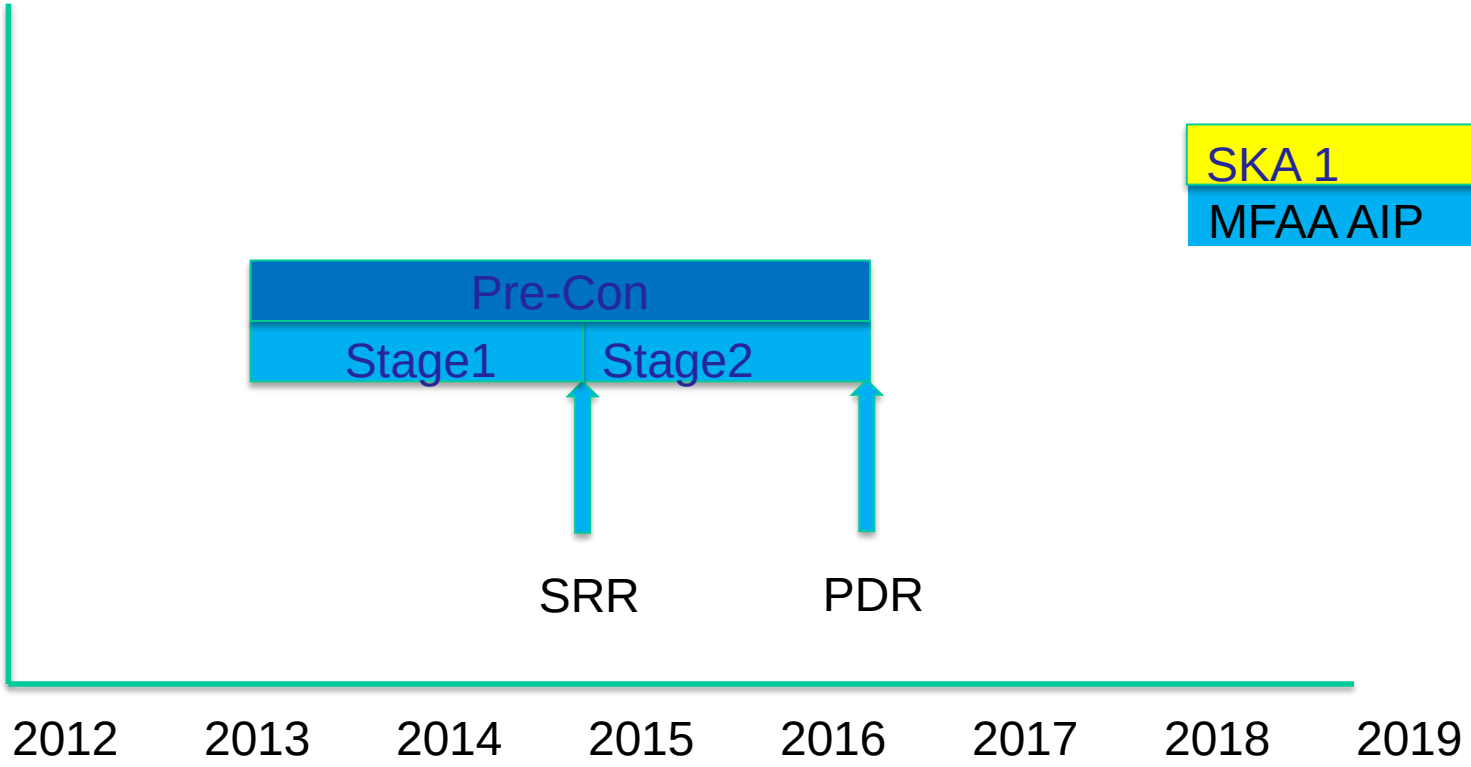
Role	Level 4 Responsibility	Proposed	Affiliation
Consortium leader	SKA.TEL.MFAA	Jan Geralt Bij de Vaate	ASTRON
Project Manager		Andre van Es	ASTRON
Project Engineer		Andrew Faulkner	UCAM
Project Scientist		Steve Torchinsky	OBSP
PA/PQ Manager		Marchel Gerbers	ASTRON
Taks Leader	SKA.TEL.MFAA.SE	Andre Gunst	ASTRON
Task Leader	SKA.TEL.MFAA.FED	Tony Brown	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	Dion Kant	ASTRON

Consortium

	Stage 1					Stage 2				
	Manpower		Industrial	Equipment	Travel	Manpower		Industrial	Equipment	Travel
	fte	K€	K€	K€	K€	fte	K€	K€	K€	K€
Full										
ASTRON	5,6	1651,0	425,0	0,0	57,8	5,6	1234,0	125,0	0,0	41,3
UCAM	0,8	72,3	0,0	18,9	5,4	0,5	51,6	0,0	13,5	3,8
UMAN	2,5	320,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
OBSP	8,8	1272,0	60,5	19,0	16,0	5,2	476,0	7,0	0,0	8,0
UB1	3,9	280,0	130,0		10,0	1,7	81,0	0,0	0,0	2,0
KLAASA	13,4	2422,3	350,0	200,0	50,0	13,2	1523,1	350,0	200,0	50,0
Associate										
SKA-SA	0,2	12,0		8,0	9,0	0,6	43,0		17,0	19,0
Malta	1	50,0				1,0	50,0			
IT	1	98,0	20,0	51,0	2,0	2,0	196,0	40,0	103,0	6,0
UOXF	0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Total	37,2	6.177,6	985,5	296,9	150,2	29,8	3.654,7	522,0	333,5	130,1

€10 M total

MFAA Schedule



From EMBRACE to SKA2

- Issues to be resolved;
  - Power consumption
  - Cost
  - Performance, calibratebility, Tsys

Front-end proto typing

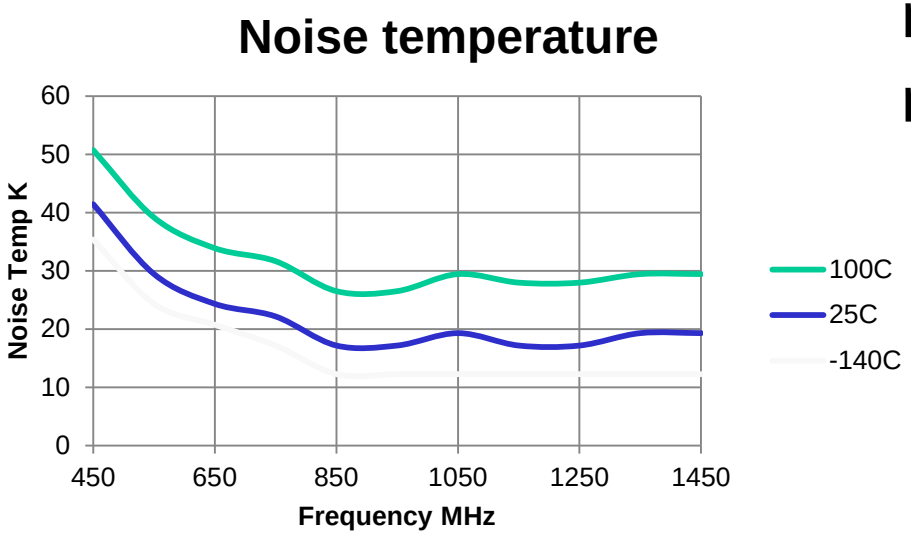
Front-end proto typing

Front-end prototyping

- Mechanical tests started in the Karoo

Octagonal Ring Antenna (ORA)

- Electromagnetic reception performance of basic ORA array has been verified
- Finite ORA array (1m^2 in area) integrated with LNAs has been measured with the lowest noise temperature of 39K



ORA with AVAGO MGA16116 simulated

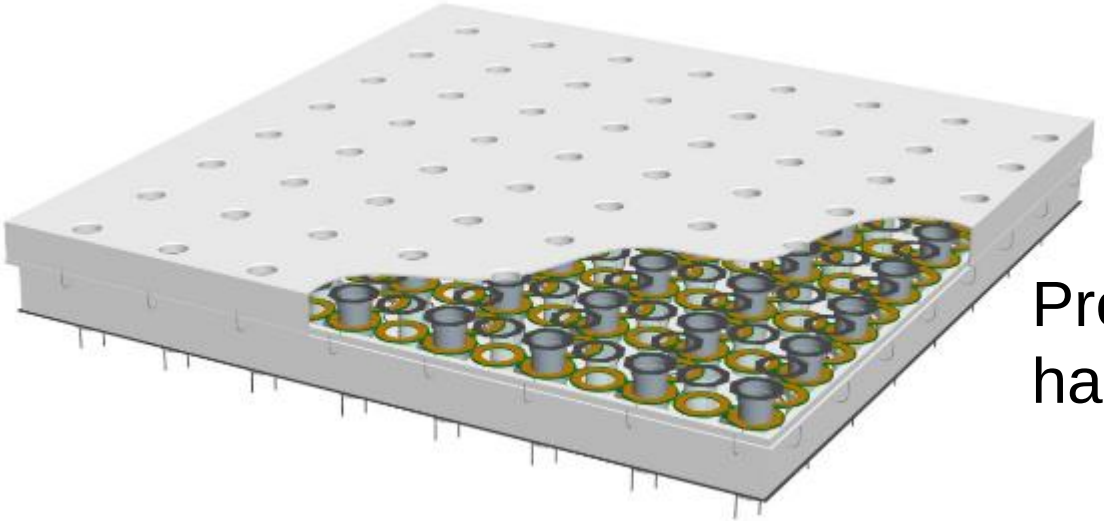
ORA Plan

T0 — 06/2014 — 11/2015 — 11/2016

ORA finite array with about 1m^2 in area will be produced

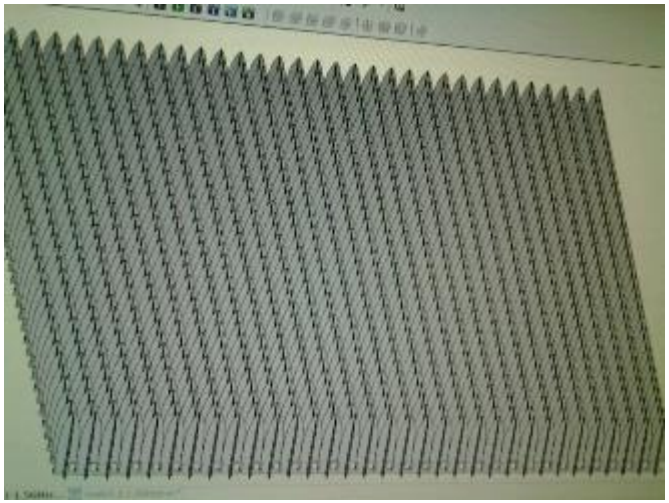
A larger finite array panel is being proposed to be built by the end of the stage 1

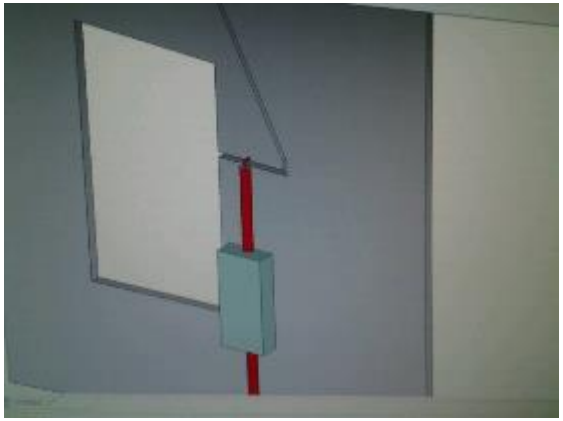
Design selected will be checked against the system requirements possibly on site, and related measurement and monitoring data collected, ready for PDR



Pre-production design study has been performed

KLAASA Front-end prototyping





- Performance and cost of the Vivaldi Antenna arrays comparision in a metal array and a dielectric-slab
- Finite Metal Vivaldi Antenna array (9m^2 in area) integrated with LNAs
- Material and manufacturing method with low cost will

- Verification system, EMBRACE — Steve Torchinsky
- AA System signal processing — Stefan Wijnholds