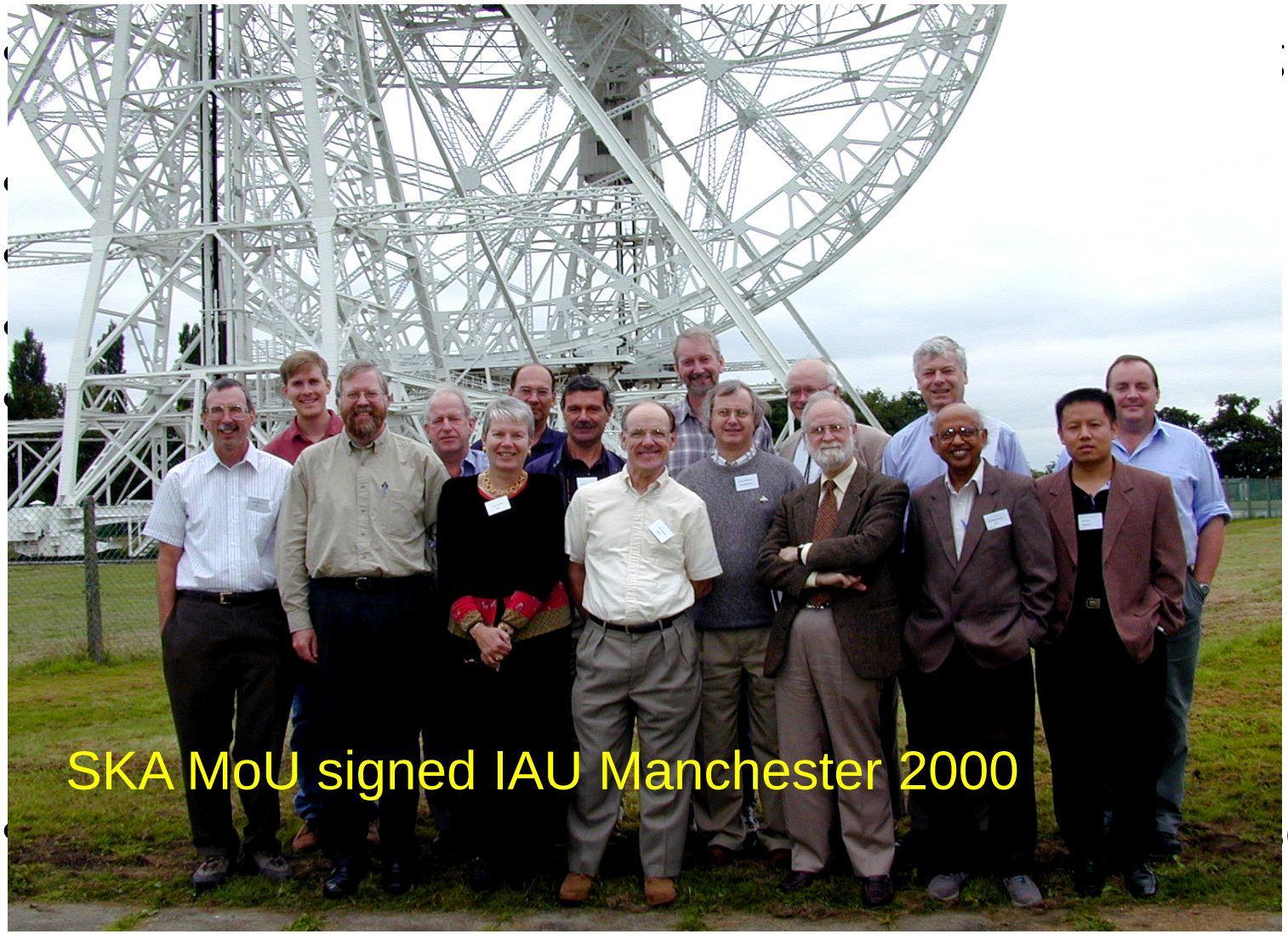
"The Lasting Legacy of SKADS"

Peter Wilkinson

How did SKADS emerge?



How did SKADS emerge?

WHERE	WHEN	WHAT
ASTRON	18 Dec 2002	Initial Coordination : AvA and PNW to organise the effort within RadioNet-1
Medicina	13 Feb 2003	Multi-beam technology coordination SAMBA and BEST & THEA++ etc
Jodrell	7/8 May 2003	Working plans: Array System architecture & beam forming
Schiphol	20 June 2003	"Supporting Actions" & the focus should be "MBRACE"
Nancay	11/12 Sep 2003	Detailed planning of response to FP6 Design Study Call
Brussels	17 Nov 2003	Bilateral with EC – our response to Design Study Call
Florence	25/26 Nov 2003	WP structure & who participates in proposal?
Schiphol	18 Dec 2003	Detailed planning of WPs
Capetown	17 Jan 2004	"SKADS " name – major roles in proposal finalised
Schiphol	23 Jan 2004	DS-T structure coordinated via "feasibility studies" and "technical preparatory work"

How did SKADS emerge?

WHERE	WHEN	WHAT
Madrid	3-4 Feb 2004	Finalising DS-Tn structure; coordinators & participants
ASTRON	Feb-March 2004	Proposal Writing…. (and a skiing holiday!)
Schiphol	6 July 2004	"Expecting" 10M funding from EC - coordinating national the matching efforts
Jodrell	17 Dec 2004	Meeting of UK-SKADS team with (EC-SKADS Coordinator + ASTRON) team → DoW update
ASTRON	9 Feb 2005	DS4 tie-up (to include T6 2-PAD)
Zandaam	24 Feb 2005	Finalising contents of DoW → final EC negotiations
Limelette	17 Nov 2005	SKADS Kick-off meeting
(Plus many other telecons and national, ESKAC and other meetings)		

Mistakes were made !…. but time to correct before proposal

FP6 SKADS: coordinator AvA

- Designed as a “complete” programme
  - Scientific and technical simulations
  - Basic technology R&D
  - Practical demonstrators of AAs & electronic beam forming
  - A costed design for an entire SKA

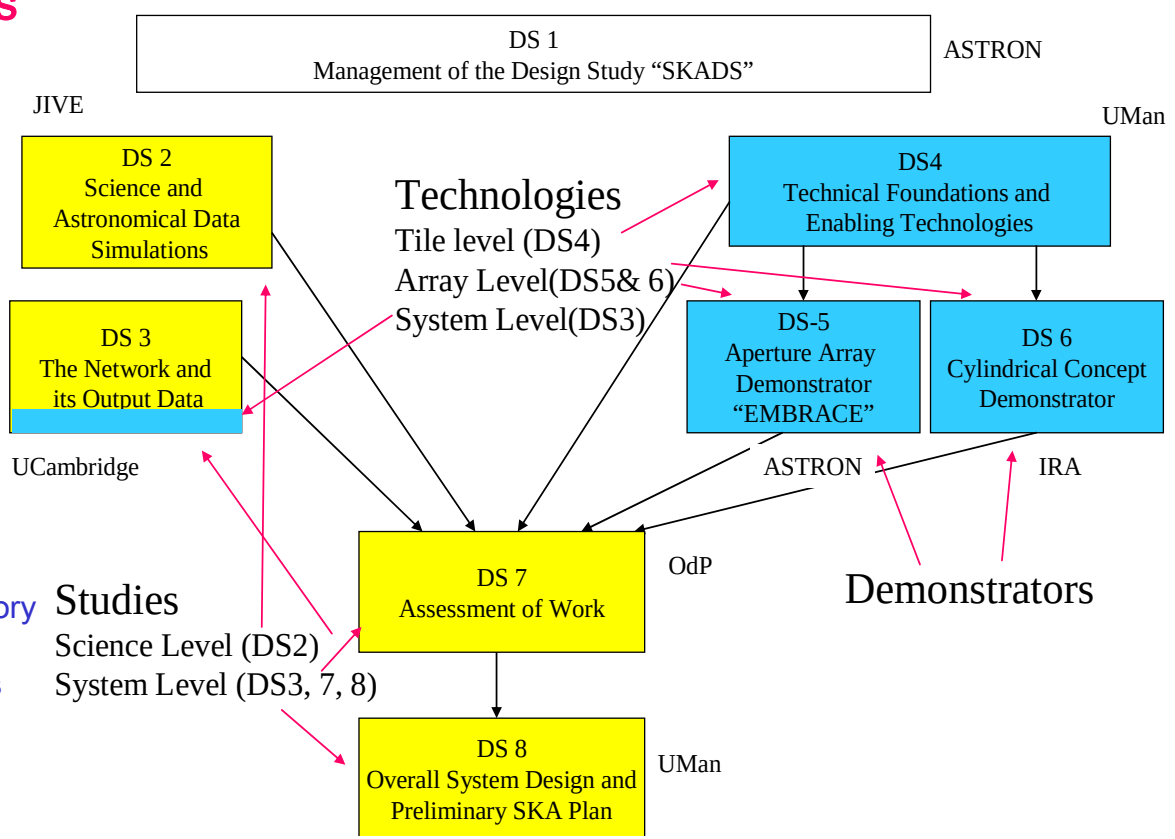
“The structure is optimized to continuously map the scientific requirements onto the technical specifications to produce a common design goal. “

- Programme unusual for EC: national >> EC funding
  - but EC funding was the crucial catalyst

SKADS Main Objectives - AvA

A 40M€ program (incl. 10M€ EC) to

- Demonstrate Technological Readiness
- Demonstrate Scientific Readiness
- Target costing issues



FP6 DS Structure:

Blue = Technical Preparatory work

Yellow= Feasibility Studies

SKADS

The European SKA Consortium

SKADS; The European Design Study towards the Square Kilometer Array

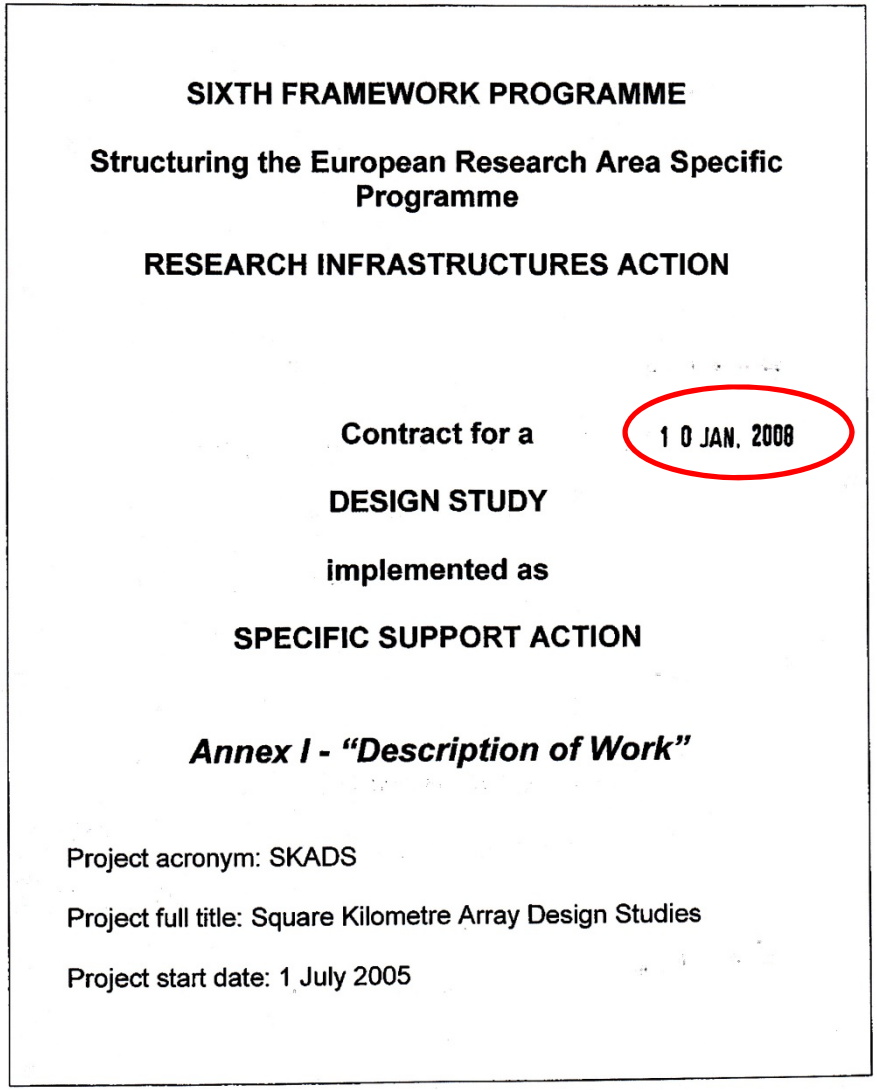
The next giant leap in RadioAstronomy

A European project
involving 29 partners from Radio Astronomy
Institutes, Universities and Industry in 8 EU countries plus
Russia, South Africa, Australia & Canada

A Cohering Program towards 2009

A. van Ardenne
SKADS Coördinator
ASTRON, P.O. Box 2, 7990 AA Dwingeloo
The Netherlands (info@skads-eu.org)
www.skads-eu.org

The final DoW took a long time….!



SIXTH FRAMEWORK PROGRAMME

Structuring the European Research Area Specific Programme

RESEARCH INFRASTRUCTURES ACTION

Contract for a

10 JAN. 2008

DESIGN STUDY

implemented as

SPECIFIC SUPPORT ACTION

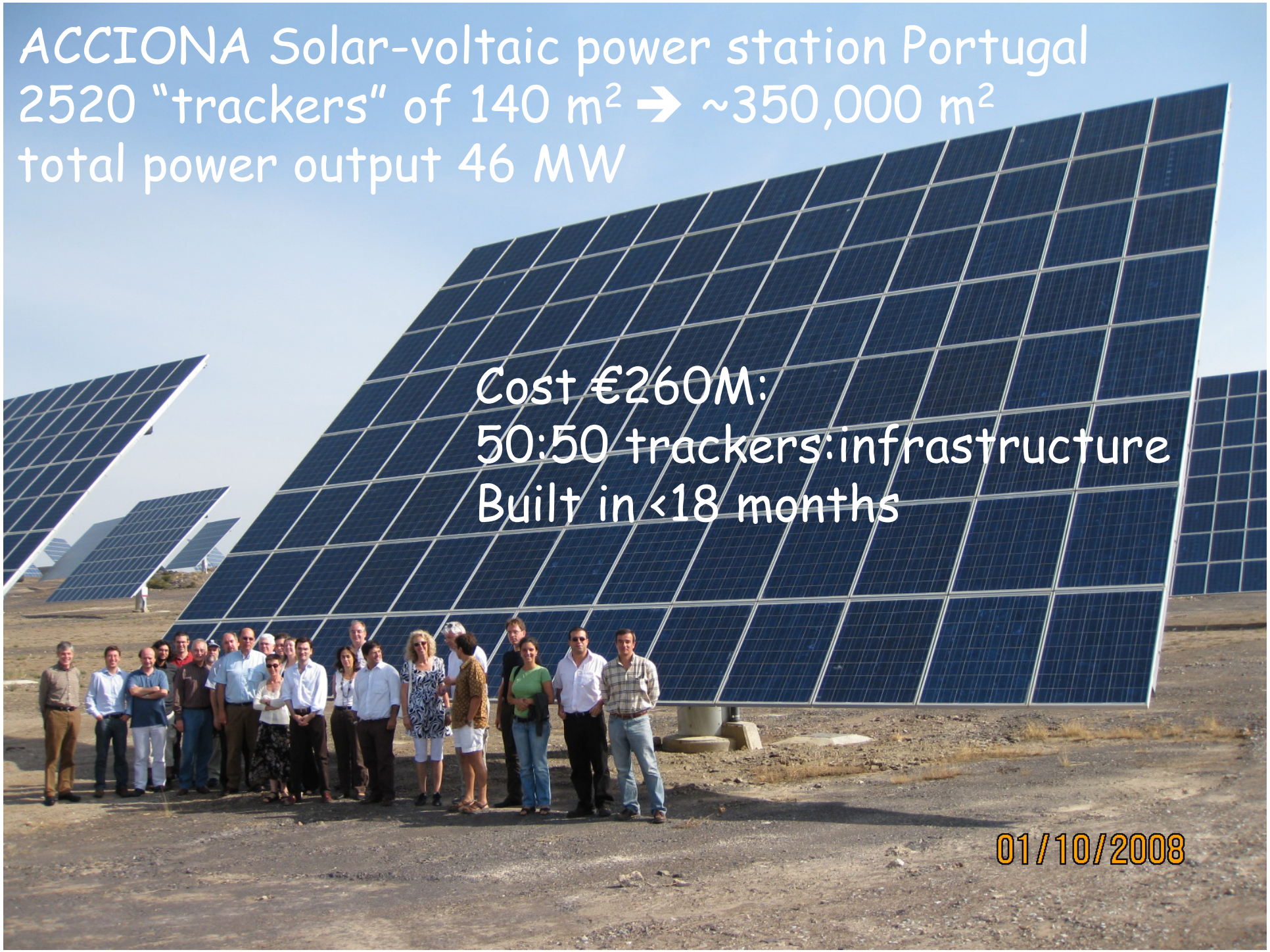
Annex I - "Description of Work"

Project acronym: SKADS

Project full title: Square Kilometre Array Design Studies

Project start date: 1 July 2005

Some mid-SKADS Memories


ACCIONA Solar-voltaic power station Portugal
2520 "trackers" of 140 m² ➔ ~350,000 m²
total power output 46 MW
Cost €260M:
50:50 trackers:infrastructure
Built in <18 months
01/10/2008


BM.11
linhas regulares intern

What did SKADS produce?

Final Report

SKADS

Square Kilometre Array Design Studies

Design Study

implemented as

Specific Support Action

Contract number: *011938*

Project coordinator: *Prof. Ir. A. van Ardenne*

Project website: *www.skads-eu.org*

Project Duration : *54* months from *01/07/2005* to *31/12/2009*

Project funded by the European Community
under the "Structuring the European Research Area" specific programme
Research Infrastructures Action

What did SKADS produce?

43 science papers and reports

46 technical papers and reports

plus a brochure…

What did SKADS produce?

MARIE CURIE ACTIONS

Sixth Framework Programme

SKADS

Widefield Astronomy and Technologies for the SKA

4 - 6 November 2009 at Limelette, Brussels, Belgium

SKADS Conference and Marie Curie SKADS Workshop

CALL FOR PAPERS

Emphasizing:
Status and astronomical capabilities of Widefield Techniques
Dense and Sparse Arrays for Innovative Science
Present SKADS Achievements; science, simulations and techniques
Technological readiness of of phased array sub-systems
System design-scenario for SKA

SCHEDULE:
Abstract deadline: September 18, 2009
Paper acceptance: October 1, 2009
Full paper deadline: November 30, 2009

Registration deadline: October 16, 2009 (expiry of block booking of rooms!)
Publication: A Conference book will be available for all participants by March, 2010

Abstract: The abstract should be not more than 300 words.
Full paper: A full paper will be 4-8 pages and may refer to posters as well as oral contributions.
Contributions: Will be presented as posters or oral session.
Acceptance as oral or poster presentation will be communicated October 1, 2009

PRACTICALITIES:
Registration: *Please register before October 16 at www.skads-eu.org/limelette2/limelette2.php*
Registration fee: *€ 150,00, including lunches, dinners and proceedings*
The conference fee should be paid by bank transfer to the ASTRON bank account before October 24, 2009.
Please mention 'Your name + SKADS conference' when making the transfer. The bank account details are:
- name: 'Stichting Astron', Dwingeloo, the Netherlands
- bank account number: 64.23.68.100 *IBAN: NL76FTSB0642368100*
- bank address: Fortis Bank, PO Box 1814, 3000 BV, Rotterdam *SWIFTCODE: FTSBNL2R*

Booking of hotel rooms: *We made a block booking of rooms at the Château de Limelette. Room price € 125,00/night including breakfast. Room reservations will be made by us based on your registration details. For any questions please contact the LOC at info@skads-eu.org*

Registration desk open:
Tuesday, November 3, 2009 11.00 - 12.00, 15.00 - 19.00
Wednesday, November 4, 2009 12.30 - 13.30

SOC:
Paul Alexander
Arnold van Ardenne
Rafael Bachiller
Wim van Driel
André van Es
Andrew Faulkner
Thijs van der Hulst
Dion Kant
Michael Kramer
Stello Montebugnoli
Tom Oosterloo
Steve Rawlings
Mario Santos
Steve Torchinsky
Jan Geralt bij de Vaate
Peter Wilkinson
Anton Zensus

LOC:
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André van Es
Truus van den Brink
Andrew Faulkner
Steve Torchinsky
Contact: info@skads-eu.org

www.skads-eu.org/limelette2/limelette2.php

10°

SKADS is funded jointly by the partner institutes, with the largest single contribution coming from the European Commission Sixth Framework Programme.
The total budget for SKADS is 38M€, of which 10.44M€ is provided by FP6.

Wide Field Science and Technology for the Square Kilometre Array

The final SKADS Conference, 4-6 November 2009, Château de Limelette, Belgium

The proceedings contains 73 contributions for a total of 421 pages.

Marie Curie Training…

First MCCT_SKADS Training School
23-29 September 2007, Medicina (Bologna, Italy)

Design of Wideband Receiving Array Systems
26 – 30 November 2007, Dwingeloo (Netherlands)

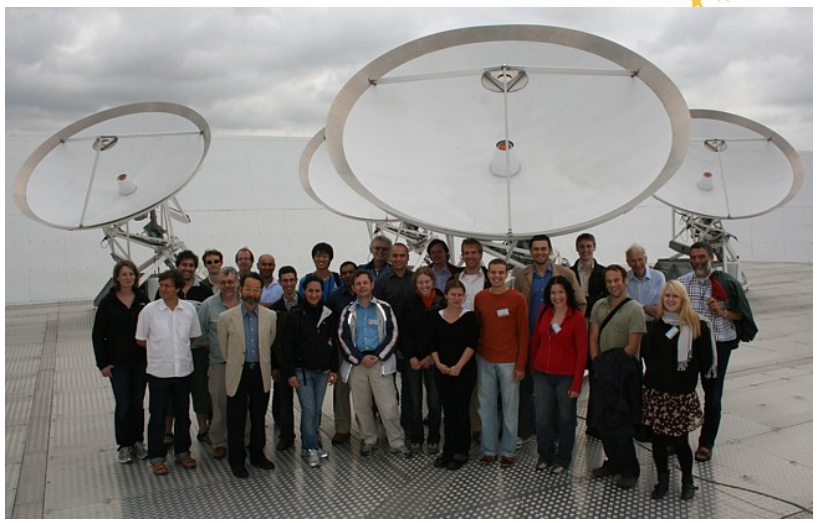
Science and Instrumentation workshop on Wide-field imaging and calibration
Groningen, the Netherlands, March 2-7 and Dwingeloo, the Netherlands, March 8-21, 2008.

Astronomy in the Next Decade :Synergies with the Square Kilometre Array
14-18 April 2008, Bonn, Germany

Radio Astronomy: fundamentals and the new instruments
26 August - 4 September 2008, Siguenza, Spain

Marie Curie Training…

Deep Field Imaging with the SKA
25-29 August 2008, Cambridge, UK



Multi-field and multi-beam science with SKA
15-27 March 2009, Oxford, UK

Towards the SKA: increasing the evolution rate in radio astronomy
24-28 August 2009, Paris, France

Towards third generation calibration in radio astronomy
27 September – 10 October 2009, Nançay, France

The SKA and Digital Signal Processing
9th-13th November 2009, University of Manchester, UK

The SKADS "legacy"

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astronc… he SKA
science…

Memo 122

The Aperture Arrays for the SKA: the SKADS White Paper

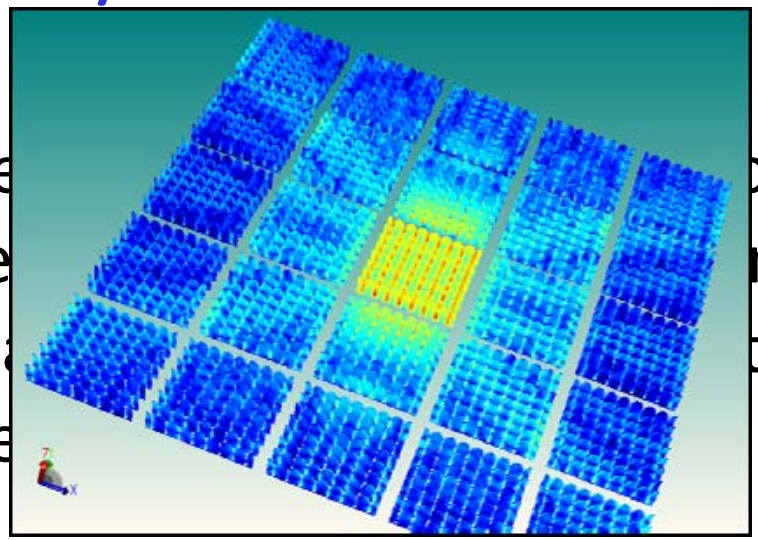
The SKADS Team

System Group:

Andrew Faulkner (Chair)
Paul Alexander
Arnold van Ardenne
Rosie Bolton
Jaap Bregman
Andre van Es
Mike Jones
Dion Kant
Stelio Montebugnoli
Philippe Picard
Steve Rawlings
Steve Torchinsky
Jan Geralt bij de Vaate
Peter Wilkinson

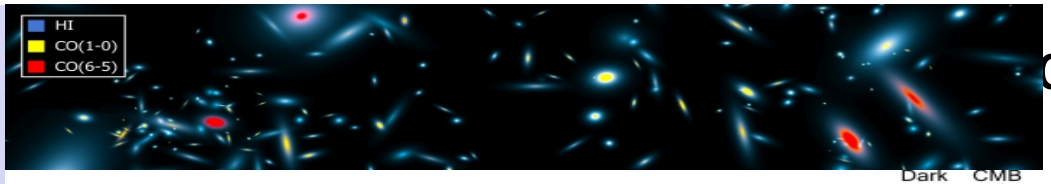
April 2010

The SKADS "legacy"



Newly developed enginee owed
also for the first time, the nna
arrays and noise performa the
interactions at circuit leve

- S^3SEX
- S^3SAX
- S^3PUL
- S^3GAL
- S^3EOR
- S^3Tools
- The SKADS VT



UNIVERSITY OF OXFORD

The SKADS "legacy"

SKADS cr
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costing m

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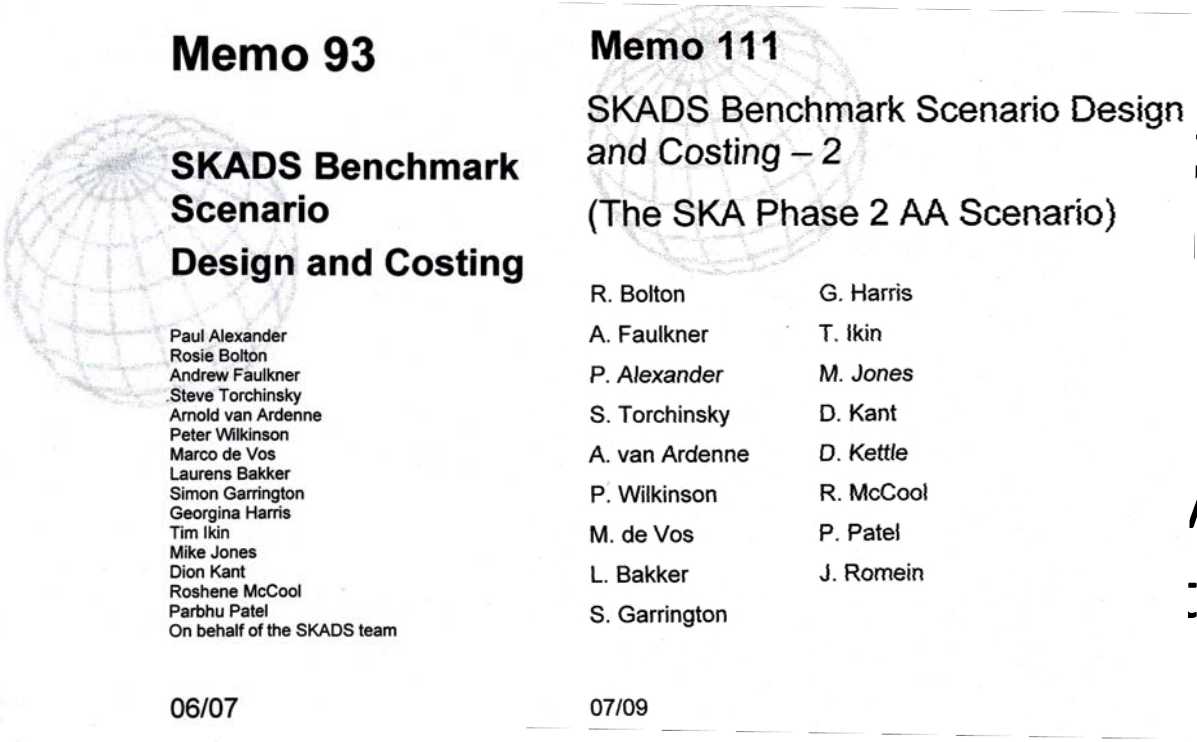
program
concept



Memo 93

SKADS Benchmark Scenario Design and Costing

Paul Alexander
Rosie Bolton
Andrew Faulkner
Steve Torchinsky
Arnold van Ardenne
Peter Wilkinson
Marco de Vos
Laurens Bakker
Simon Garrington
Georgina Harris
Tim Ikin
Mike Jones
Dion Kant
Roshene McCool
Parbhu Patel
On behalf of the SKADS team

06/07

Memo 111

SKADS Benchmark Scenario Design and Costing – 2

(The SKA Phase 2 AA Scenario)

R. Bolton
A. Faulkner
P. Alexander
S. Torchinsky
A. van Ardenne
P. Wilkinson
M. de Vos
L. Bakker
S. Garrington
G. Harris
T. Ikin
M. Jones
D. Kant
D. Kettle
R. McCool
P. Patel
J. Romein

07/09

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n
tegrated

AAVP, a
he AA-

→ "PREPSKA" → SKA Preconstruction phase

Without SKADS probably no PrepSKA support by EC

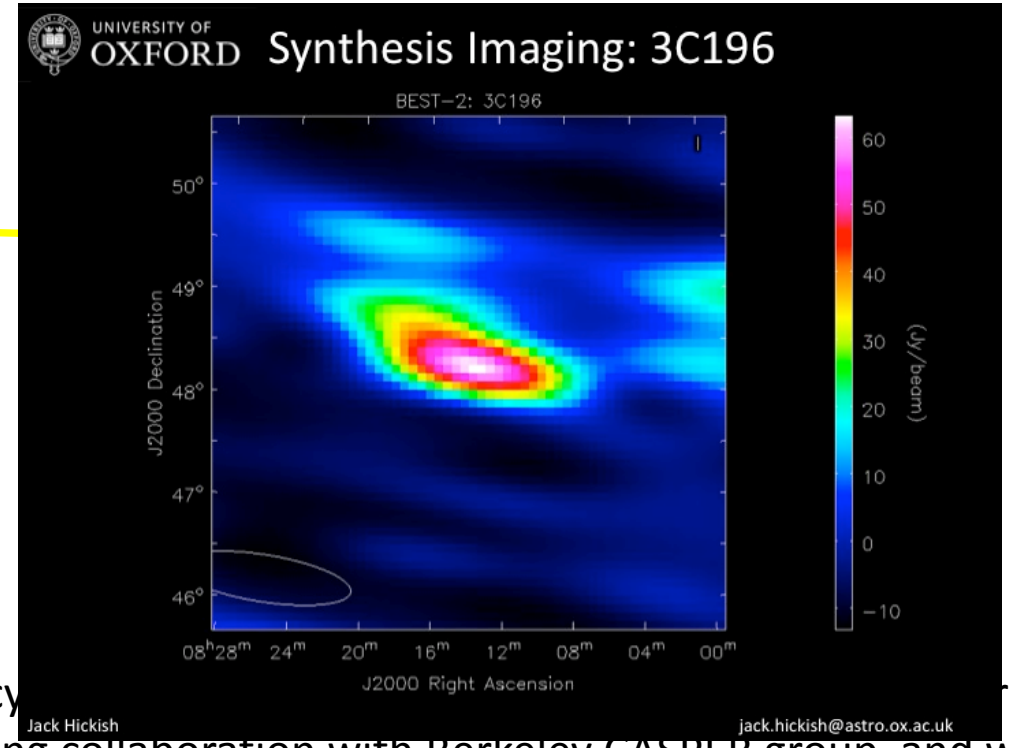
SKADS follow-ons: AAVP by AvA

to be

SKADS follow-ups: AAVP by AvA

SKADS follow-ons: BEST-2

4 Rx Each Cylin.



- 32 Rx @ 408 MHz
- Tsys ~ 90 K
- Bw = 16 MHz
- Area= 1400 m^2
- One Pol.
- 8 (24x7 m) cylinders
- 21 beams

- Refit of 8 cy … Cross Array
- Beamforming collaboration with Berkeley CASPER group and with U. Oxford

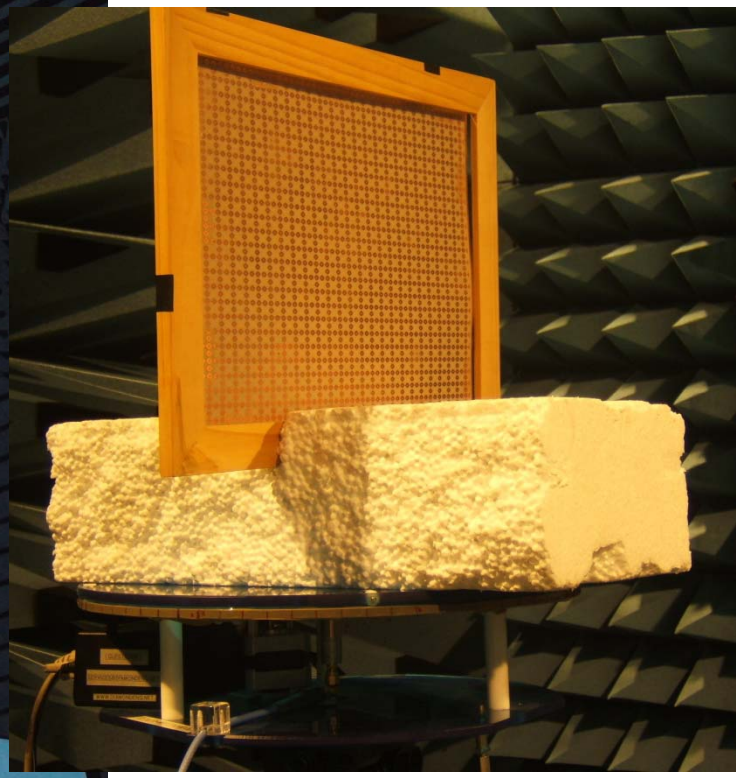
- Applying for funds to extend to 24 more cylinders
- Aim is space debris orbit tracking: 93 beams in FoV of ~40 deg^2

SKADS follow-ons: Octagonal Ring Antenna (ORA)

Ongoing studies for

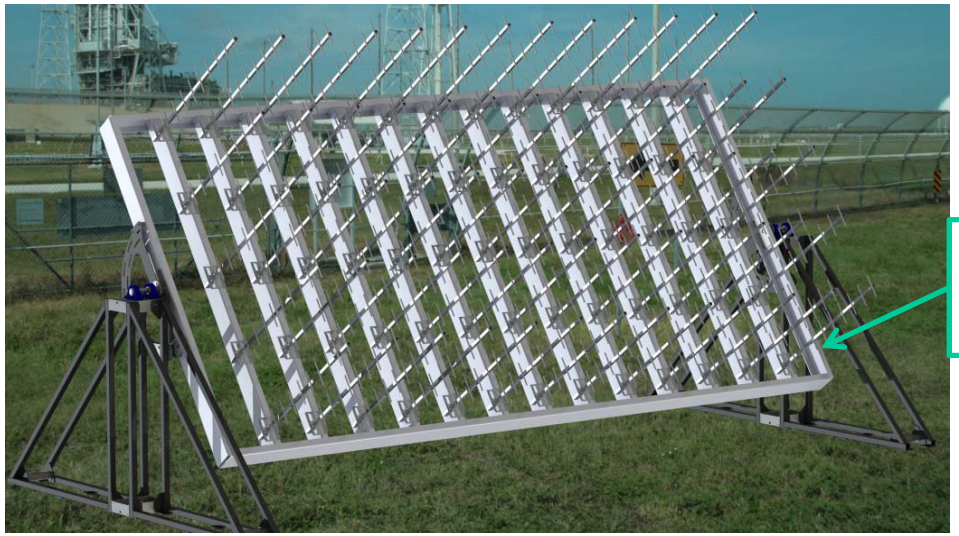
Mobile communication base station
690-2700 MHz.

Airborne radar
C-X band (3-10GHz) &
X-Ku band (8.5-18GHz)



SKADS follow-ons: (SAMBA & 2-PAD)→ "MUST"

Low-cost, multi-disciplinary, staff+students to design, build & operate



6.75 x 3m GRP frame
A_{eff} =20m^2 in each polarisation

- **Q3 2013: Prototype: 5 frames at Jodrell Bank + CASPER-based DSP**
- **Goal: "RAPIDE" 100 frames (2000 m^2) for world-class pulsar+ transient science plus public outreach**

A few final smiles…

In the police wagon..

Orthogonal visions…

but one direction is special.....


Wide Field Astronomy and Technology for the SKA
The Final SKADS Conference
Chateau de Limelette, 4-6 November 2009
Low noise design experience fo
SKADS/BEST demonstrato
Federico Perini
INAF-IRA (I)
Wide Field Astronomy and Technology for the SKA
The Final SKADS Conference
Chateau de Limelette, 4-6 November 2009
The great coordinator
Le
COCKTAIL
du mois
image by SATorchinsky