# The Dawn of the SKAI

#### what really happened

#### (a.k.a. SKA, the prequel)

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# Be careful in what you ask of the Gods (i.e. the SOC)...

... because they might grant it to you.

#### **"The Hydrogen Array"** by Peter Wilkinson IAU colloquium 131, Socorro, Oct 1990

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"I thank Jan Noordham for pointing out that a large array is being discussed by Braun and others in the Netherlands"

"and for his impudent suggestions to the conference organisers which led to this talk being given"

### The Socorro Event

- The conference assumed that radio astronomy was now mature, and just needed mopping up
  - After all, this was the end of the "selfcal decade"
  - And there was much talk of other wavelengths
- Criticism was manfully received, so a small session on "the future" was scheduled
- In the ensuing "ballet of modesty", Peter W was (easily) persuaded to give the talk
- He did a superb job

### The time had come...

- Somehow, the time was ripe for thinking about a Square Km Aarray
  - Govind Swarup
  - Our Soviet colleagues (Pariiskii et al)
  - Peter Wilkinson
  - Robert Braun
  - ....?
- We should honour them all, and try to build one

### What happened in Dwingeloo

- Robert Braun disdained our discussion about extending the WSRT with some N-S baselines
- He emphasized the need for collecting area
  - Perhaps even a square kilometer!

## The Dwingeloo Setting

- Robert Braun disdained our discussion about extending the WSRT with some N-S baselines
- He emphasized the need for collecting area
  - Perhaps even a square kilometer!
- We laughed at the idea, of course...
- ...but those were leisurely times...
- ...and we had a good place to talk...
- ...so we happily addressed the Question...

#### The Question

#### If you want lots of affordable

# collecting area

how would you do it ...?

### The Old Dwingeloo Canteen



#### EURO16: PROPOSAL FOR AN ARRAY OF 16 LOW COST 100 METER RADIO TELESCOPES

J.E.Noordam, R.Braun, A.G.de Bruyn

#### August 13, 1991

Summary: The next big step forward in radio astronomy will require a massive increase in collecting area. Ultimately, one square km will be needed for the imaging of individual galaxies in HI at high redshifts. But there is already a very strong scientific case (outlined here) for an array with 16 telescopes of 100m diameter, a maximum baseline of 15-20 km, and a minimum operating wavelength of 20 cm. This "EURO16" (Early Universe Radio Observatory) array could be funded nationally, provided the mechanical part of a 100m telescope, with limited surface accuracy and steerability, could be built at a cost of a few MECU. A number of more or less promising designs are given here. Depending on the scientific enthusiasm of the Dutch community, NFRA could do a more extensive feasibility study in the near future.

#### Contents



Eurly Universe Radio Observatory EURO16 [,32,64,128,...]

- 16,32,64,128 telescopes of ~100m diameter
- Observing @ 150-1500 MHz
- Cost: ~200 \$/m<sup>2</sup> (200 M\$ for EURO128)

• To be operational around 2000





### **Braun Easter Eggs**



2 ...

me - m . W. C-Linial Mount Paraholoid





#### Aperture Arrays (the 2 Golden Rules)

Figure 3: Design III: Phased array

# The Radio Schmidt (DRAO)

- Many 9m dishes (larger than you think)
  - Small D Large N
- Not included in EURO16 concepts
  - All Large D Small N
- We did not yet realize that SKA would operate in a new regime
  - With a million 1 sigma foreground sources
  - Which requires a PSF sidelobe level < 0.1%





## We were pretty Perceptive (II)

- Brainstorm about future radio astronomy in NL
  - Groningen, 29 May 1991
  - As part of the retirement of Huug van Woerden

- About "WSRT, VLBI and beyond"
- Organized by AGB, JEN,

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#### What we forgot to discuss...

#### We focused on Science and Sensitivity

Totally ignoring the Inconvenient Truth that...

...between your Data and your Result...

...stands software

# Another Seminal Development

#### (also started in Socorro, Oct 1990)



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#### (also started in Socorro, Oct 1990)



# The moment that SKA really began...

- Excited chatter of visionaries is all very well
- But things only happen when serious players step in, representing serious interests
- So, in 1991, in Hotel "de Borken" in Lhee
  - The new, young, dynamic Director of ASTRON
  - And the most influential radio astronomer in the world
- ...had a long conversation



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Thank You