

A VLBI antenna **for** the island of Madeira

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et... YOU

PRESENT

10 antennas

10th EVN Symposium

87 external participants

This talk

VLBI antenna (1998-2010-....)

18 antennas

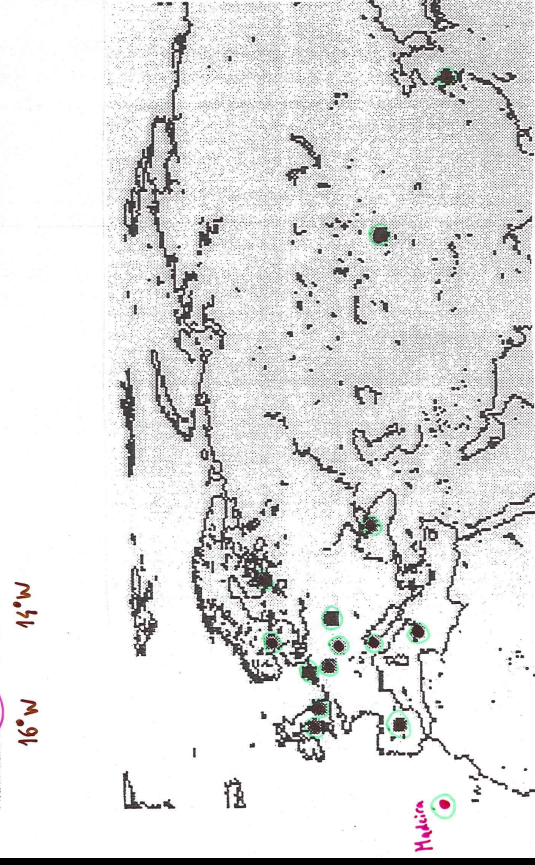
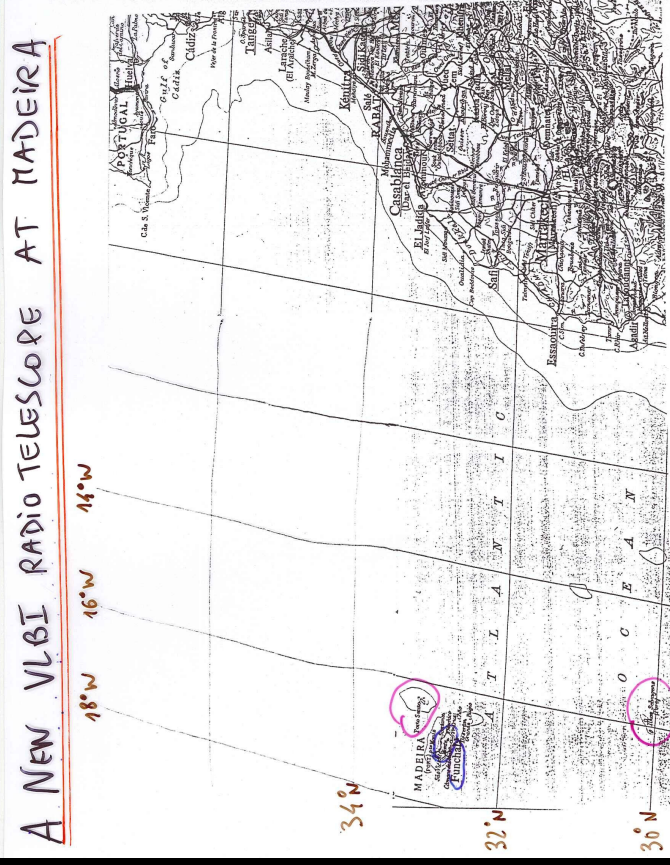
SOCIAL/EDUCATIONAL

- ↳ Currently: ^{two} one resident professional astronomer at Madeira
- ↳ Plan: - increase this number ✓
 - increase cooperation with worldwide astronomical institutions (namely EC) ~
- ↳ Outcomes: - professional astronomy is possible, residing at Madeira ✓ (even AIPS)
 - development of equipment and library material ✓
 - two MSc students start work by 2000 ✓
 - three-four young researchers conduct observational projects ✓ (six)
 - public/scientific presentations by the MARGA team ✓
- ↳ 300 000 locals: - contact with the progress of astronomy research at Madeira/worldwide ✓
 - “Astronomy Party” events (once a year) ✓ (9th)
- ↳ Long-term plans: - open Astronomy degree at the Universidade da Madeira ✓
 - X** - build a major astronomical facility at Madeira (radio or optical)
 - XX** - build a Planetarium/Museum for the Public Awareness of Science

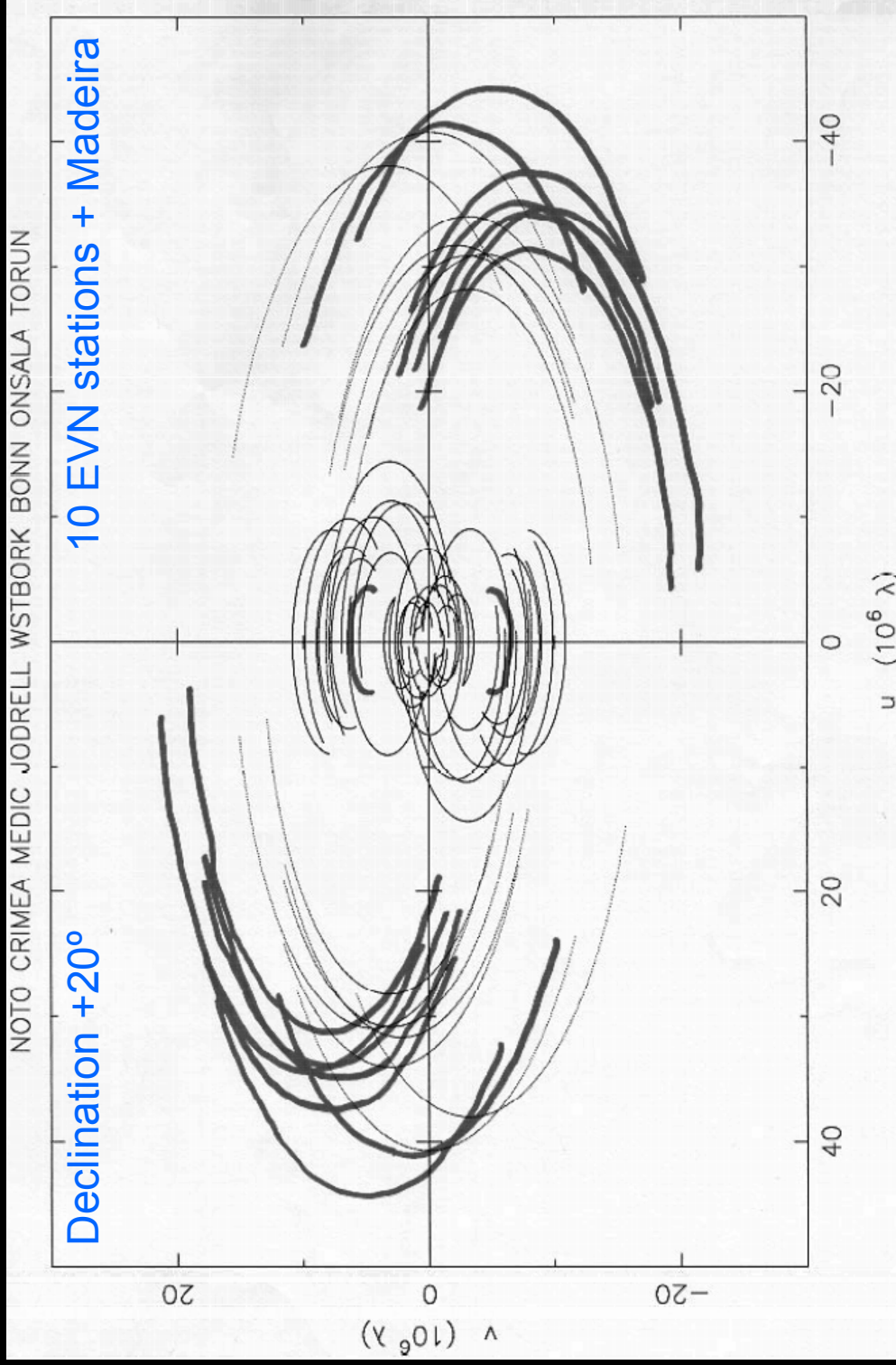
Still history (sorry a million...)

- at the EVN/JIVE Symposium No.4, 23/10/1998

Short talk allowed on Madeira antenna plans



West and South of all stations



MAXIMUM BASELINE (RESOLUTION)					
WAVELENGTH	VLBA	EVN	Stations	EVN + Madeira	Improvement
92 cm	8600 Km (22 mas)	8476 Km (22 mas)	Jb, Wb, Nt, Sh, Or, Tr, Sm	9950 Km (19 mas)	~20%
18 cm	8600 Km (4.4 mas)	8476 Km (4.4 mas)	Jb, Wb, Eb, Nc, Nt, On, Sh, Or, Tr, Sm	9950 Km (3.7 mas)	~20%
6 cm	8600 Km (1.5 mas)	8476 Km (1.5 mas)	Jb, Wb, Eb, Nc, Nt, On, Sh, Or, Tr, Sm	9950 Km (1.3 mas)	~20%
1.3 cm	8600 Km (0.3 mas)	2782 Km (1 mas)	Jb, Eb, Nc, Nt, On, Sm, Nz	4600 Km (0.6 mas)	~60%

Antenna: 25m up to 43 GHz

Seismically stable; hurricane free

Recommendation signed by “70 scientists from 16 countries”

(page 1)

A New Radio Telescope in Madeira/Porto Santo







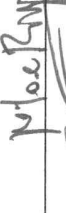







We, signed below, strongly recommend a new radio telescope to be built at the Archipelago of Madeira (Portugal, 16° W, 33° N). If part of the European VLBI Network (EVN), this telescope would both allow extra resolution for the EVN and more efficient coverage of the “mid-Atlantic gap” present on Global VLBI observations.

INSTITUIÇÕES NACIONAIS

INSTITUIÇÃO	NOME	ASSINATURA	DATA
Universidade da Madeira	PEDRO MANUEL EDMOND R. S. AUGUSTO	Pedro Manuel Edmond Ros da Sila Augusto	30/7/98
IST/UTZ	ANTONIO A. DA COSTA	Antonio A. da Costa	30/7/98
CAUP	PEDRO PINA AVELINO	Pedro Pina Avelino	30/7/98
OBSERVATÓRIO ASTRONÓMICO BREGA	CATARINA G. GODINHO LOBO	Catarina Godinho Lobo	5/11/98
OBSERVATÓRIO Astron. Lisboa	MARGARIDA SEROTE ROOS	Margarida Serote Roos	6/11/98
Observatório Astron. Universidade de Coimbra	MARCELO ROOS SEROTE	Marcelo Roos Serote	6/11/98

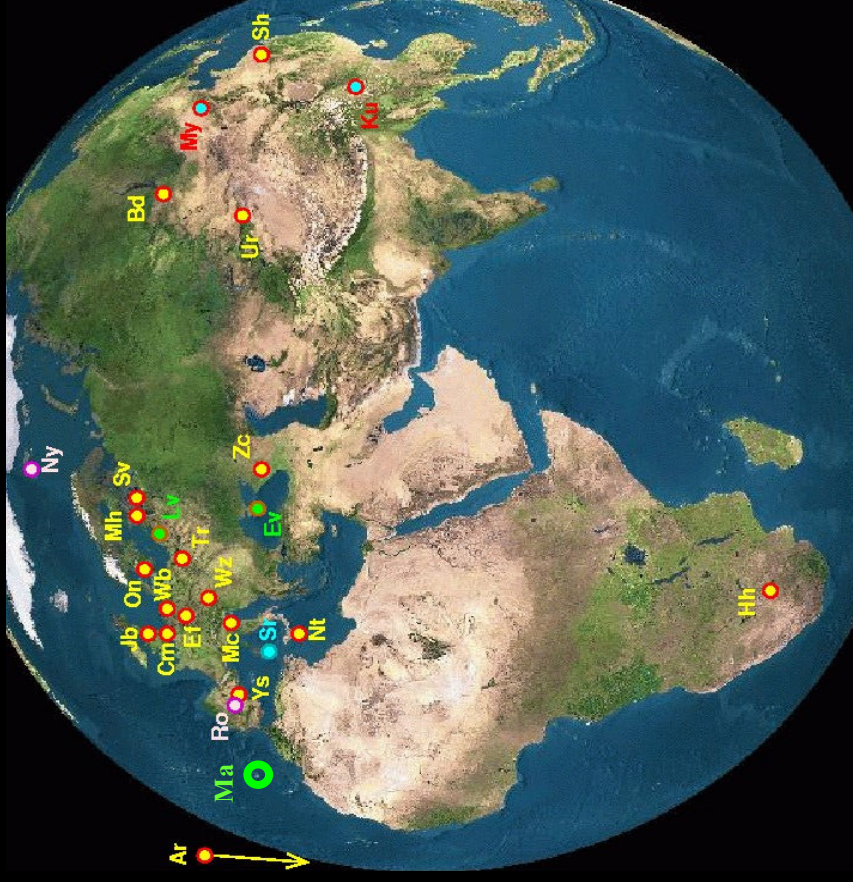
A New Radio Telescope in Madeira/Porto Santo

INTERNATIONAL INSTITUTIONS

INSTITUTION	NAME	SIGNATURE	DATE
Joint Institute for VLBI in Europe	dr. H.J. van Langevelde		23/10/98
Joint Institute for VLBI in Europe	dr. L.O. Späwermann		23 OCT 98
Joint Institut für VLBI in Bay.	Dr. MARIA MASSI		23 OCT 98
Max Planck Inst. f. Radioastr.	POL SILVERH		23/10/98
ISTITUTO DI RADIOASTRONOMIA	FRANCO MANTOVANI		23/10/98
ISTITUTO DI RADIOASTRONOMIA	MARIA RIOJA		23/10/98
Univ. of Ioannina	Nectaria Gizani		23/10/98
BOLOGNA UNIVERSITY	CARLE GIO VANINI		23/10/98
Inst. Radioastronomie	Luca Sioddi		24/10/98
OBSERVATORIO ASTRONOMICHO NACIONAL	Francisco Colomer		24/10/98
Aspa Space Centre	Andrey Chuprikov		24/10/98
Beijing Astronomical Observatory	Wenwu Tian		24/10/98
NRAO, CHARLOTTESVILLE, VA USA	Ed Fomalont		24/10/98
Institute of Space + Astronomical Science	Jim Lovell		24/10/98

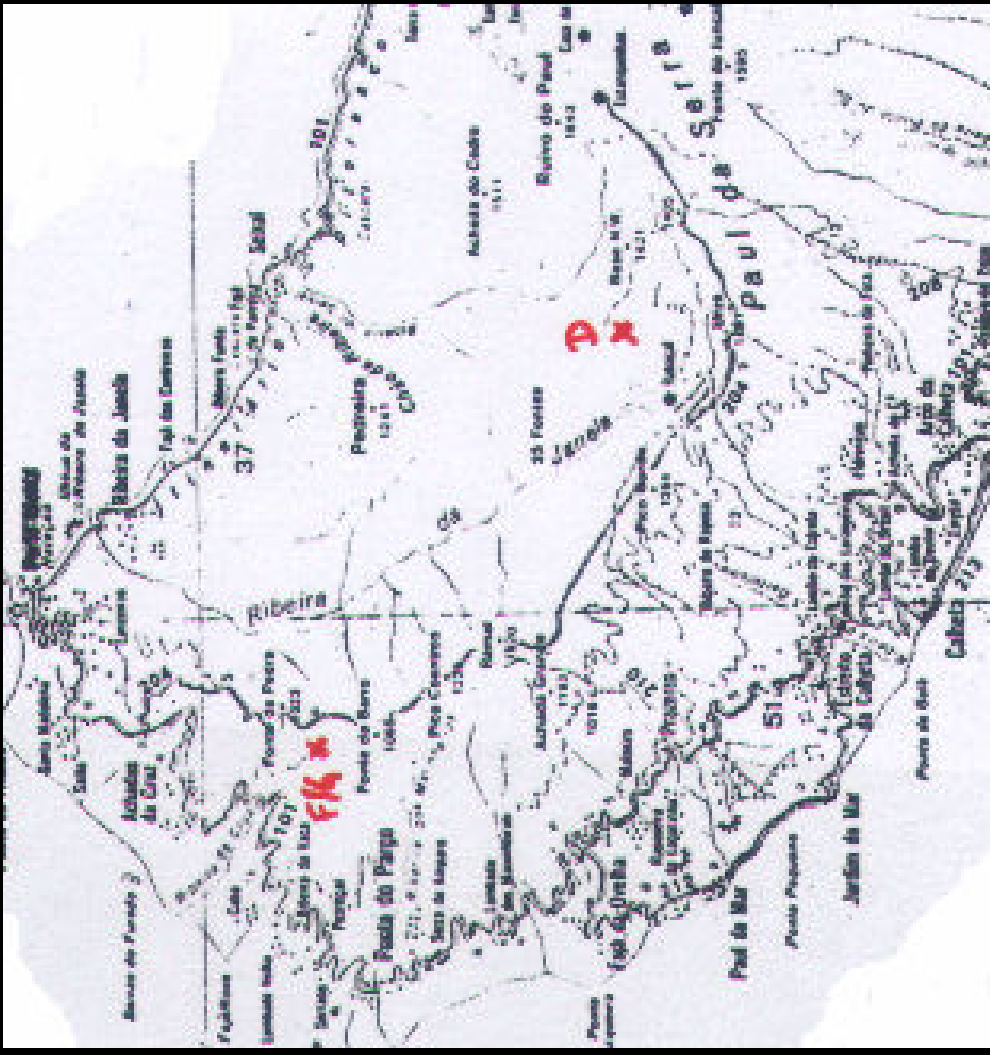
Today:

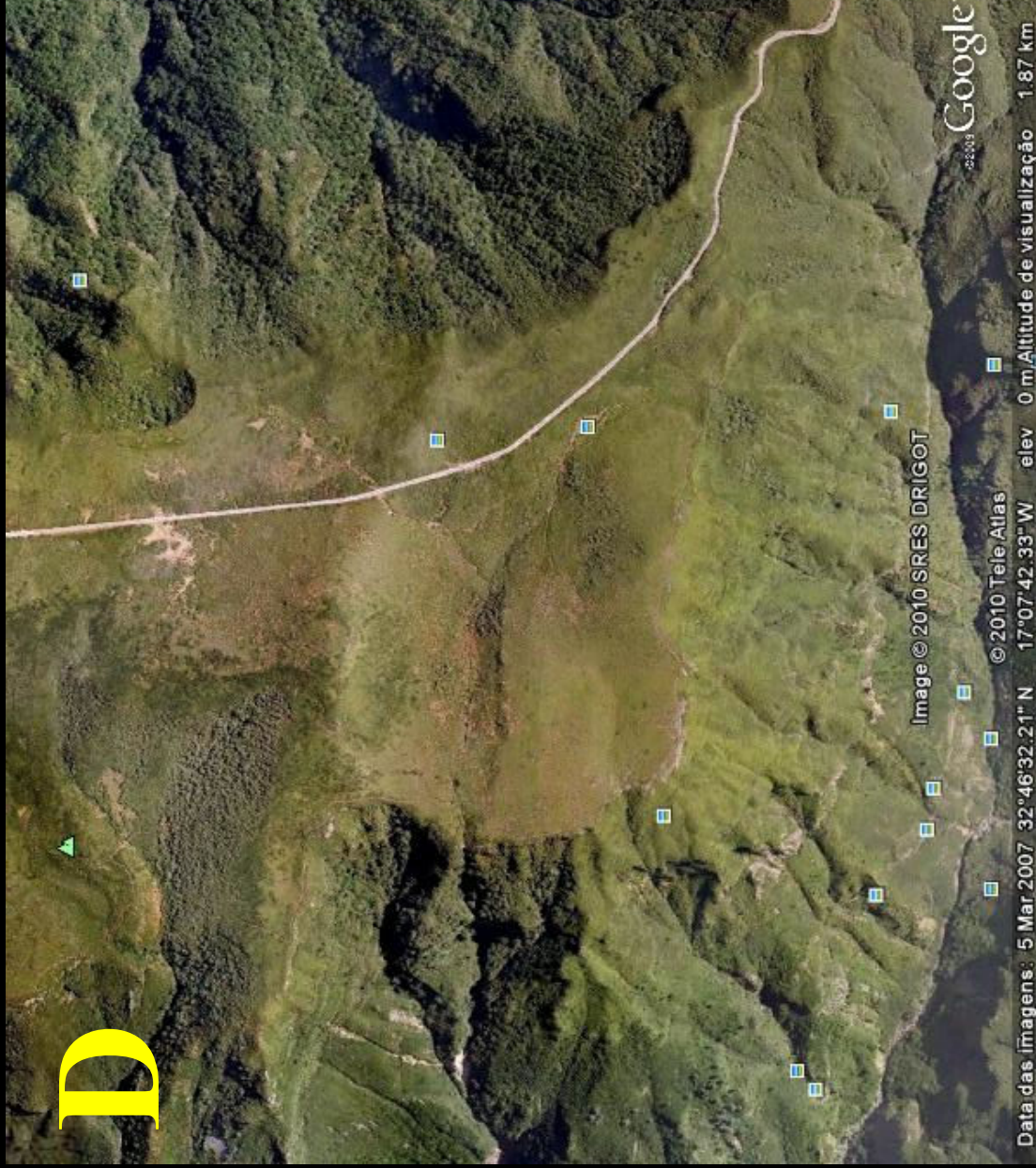
- Reduce the infamous ‘mid-atlantic gap’ now also seen in the u-v plane coverage of EVN (due to Arecibo)
- The argument only gets stronger when considering Hartebeesthoek (Hh)
- As a whole on the planet, the EVN has an east-west configuration
- Approaching the southern hemisphere gets better sensitivity and...
- all the action will take place there in the next decades (ALMA, SKA, E-ELT).

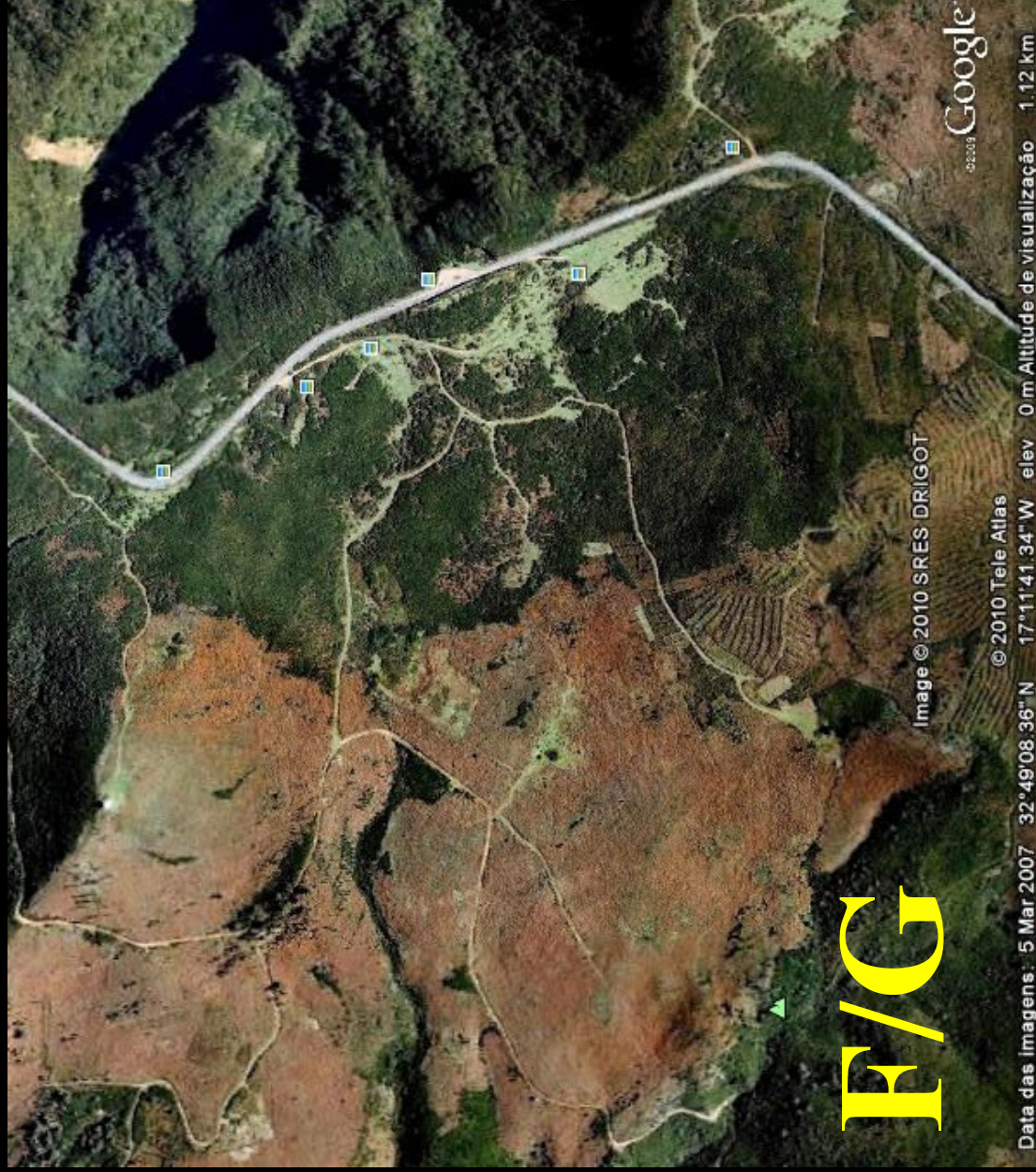


A VLBI antenna for Madeira

- Ideal site: shallow valley protected from man made interference; not exposed to frequent gusty/very strong winds
- Seven sites (A-G) were initially selected for on-site inspection
- Two (D and F/G) are now left
- D at 1300m
- F/G at 1000-1100 m (gentle westlooking slope)







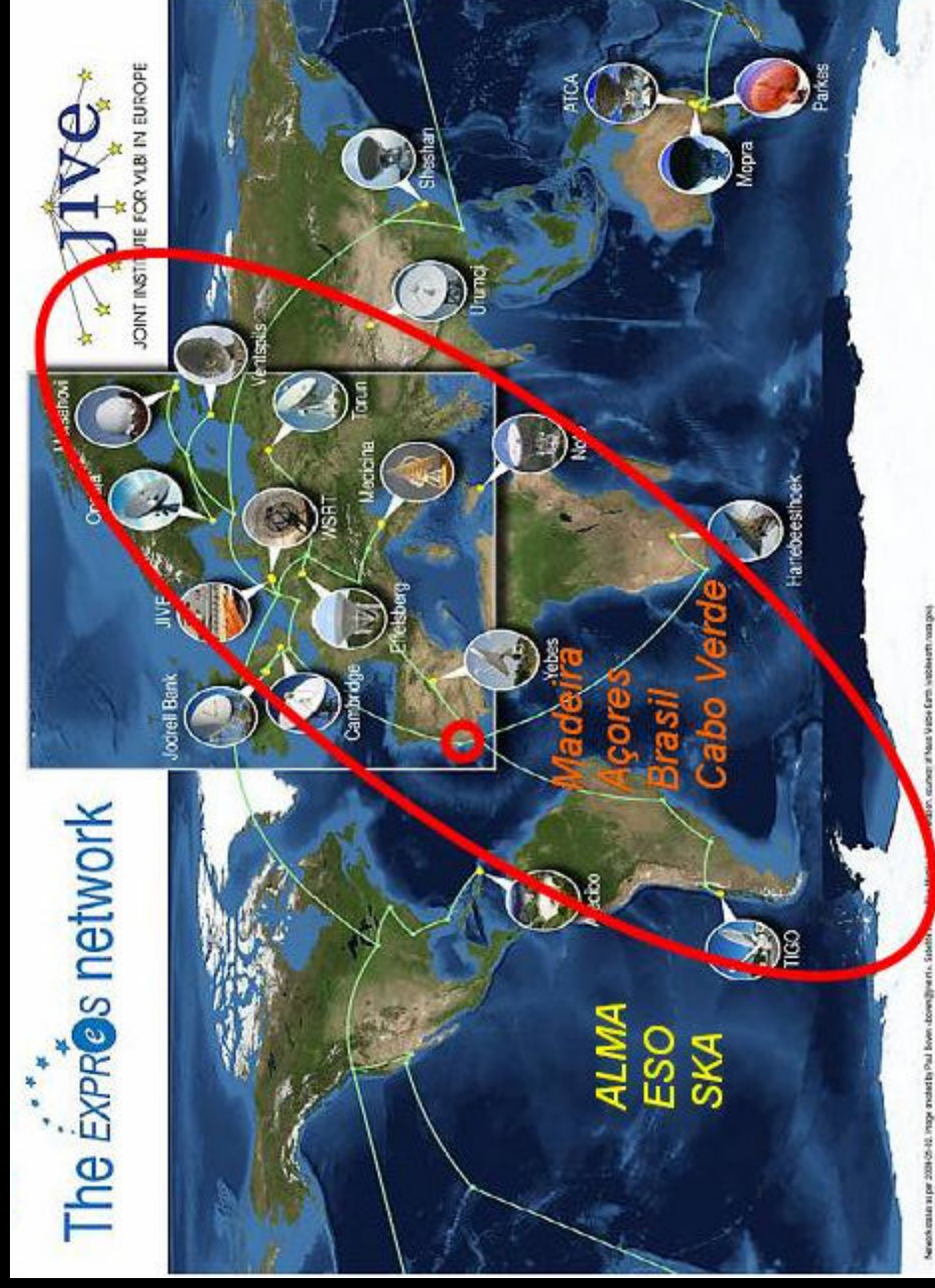
F/G

Results:

- Wind is not a problem for any of the two sites
- Column water vapour information is still being assessed from satellite data [looks promising]
- RFI: both sites are excellent. At peak interference, both are better than the IAU recommendations by a factor of over 20! And by a much higher factor at the mean RFI level

More islands

The current move south of the largest astronomical instruments skyrockets all Atlantic islands as particularly relevant places for VLBI radio antennas.



Comments to
“The *ASTRONET Infrastructure Roadmap*”
2nd July 2008

“1 – Where have current long-range radio interferometric observatories gone from your document? (e.g. European VLBI Network – EVN and MERLIN; e-version of both, preferably).”

“miniscule amount it really devotes to this topic.”

“EVN and MERLIN became low-priority instruments - the only long-range interferometers in the discussion.”

“number of pages: [five for] optical telescopes and... two-pages to mm/sub-mm/Radio Observatories. [...] **four lines of text** are devoted to Radio Observatories in Europe.”

Unfortunate citation: “ ... as claimed by the European VLBI network.”

“e-EVN [...] should beat in sensitivity the pair “EVLA/e-Merlin” (<1mJy expected) [...] Are we proud of all European achievements and ambitions... or just on part of them?”

“wavelength concerns to panel B. [...] jumping over centimetre wavelengths.”

“1.3 – *Why are they relevant?*” [e-MERLIN and e-EVN]
[resolution; pan-european; answer to Science Vision questions; Public Awareness of Science]

“1.4 – *A trick-surprise on my sleeve...[Madeira]*”

“The current plan is to place a **40m, 86 GHz** capable instrument in Madeira.
[...]join] mm-e-EVN”

“a > €10M project [...] “small” and “short-term” [cost] categories. [...] (ground-based, near-term).”

**Might be on 2020 review by
Richard Porcas (2010-20)...**

... or on 2040-50 review

EXTRA, EXTRA!...

HOT news:

FCT has joined ASTRONET



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CONSORTIUM

National

International, i.e.,

1st the People

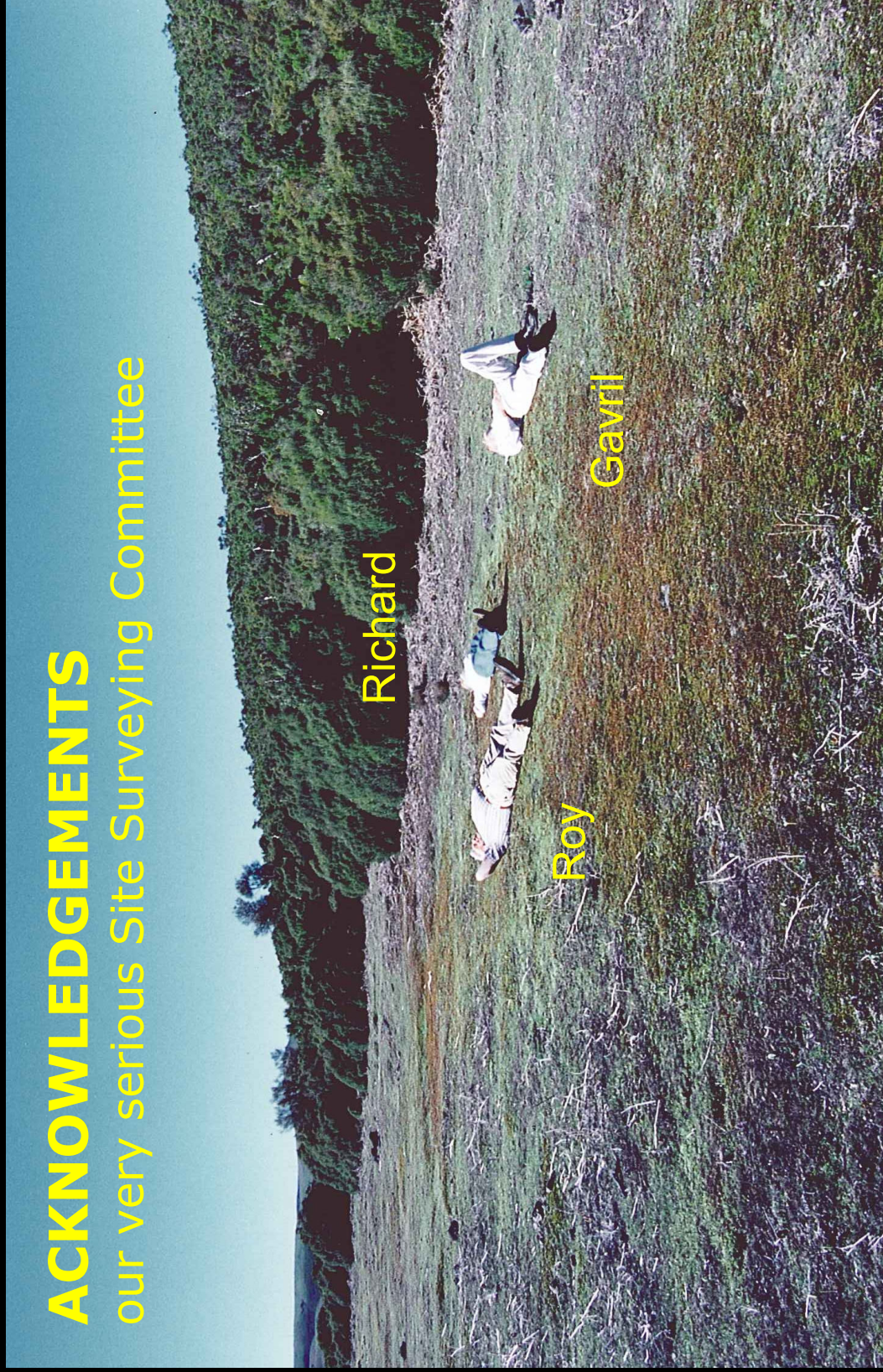
2nd the Institution

YOU

augusto @ uma.pt

ACKNOWLEDGEMENTS

our very serious Site Surveying Committee





Pedro Augusto

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NOT the end...