



Setting up a Global VLBI Alliance

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Why a Global VLBI Alliance?



- VLBI is a truly collaborative effort – for more than 50 years now !
- There are now several VLBI networks established and running
 - With their own characteristics, often offer *open skies*
 - Each is recognised under a unique brand: EAVN, EVN, VLBA, LBA, GMVA, HSA, LOFAR/ILT, EHT, IVS ...
- Often, VLBI networks cooperate, also observe together
- Some radio telescopes belong to more than one VLBI network
 - E.g. Chinese telescopes in EVN and EAVN, HRAO in EVN and LBA, Eb(+Ar) in EVN and HSA, etc.
 - Also applicable to new instruments (e.g. Thailand 40m, uGMRT, etc.)
- The Global VLBI Alliance is a permanent forum
 - where the network representatives can meet
 - where the VLBI users can discuss and present their current issues and future needs
 - also as point of contact for collaboration with third-party instruments

Why a Global VLBI Alliance? (II)

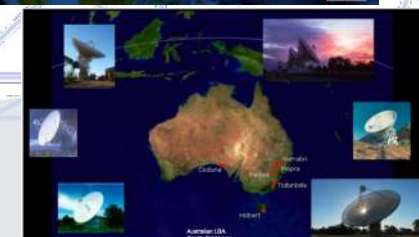


- To **share information** in a timely and structured way between VLBI networks
 - Strategic developments (also to exploit *complementarity*)
 - Science vision
 - Technology paths
 - Proposal types, deadlines and evaluation
 - Logistics
 - Scheduling
 - And keep inventory of the developments
- For (non-expert) users and other stakeholders to have a clear and **visible entry/contact point** to the VLBI facilities
 - GVA web
 - Extended user support (also among networks)
 - Support to new facilities and groups (e.g. in Africa-AVN, Latin America-IVIA)
 - Education and outreach of VLBI
- Also to **coordinate joint observations** (but not only)
 - In particular with third-parties instruments (multi-messenger, SKA-VLBI)

GVA participant networks



- Very Long Baseline Array (VLBA, USA)
- European VLBI Network (EVN/JIVE)
- East Asian VLBI Network (EAVN)
- Southern Hemisphere Long Baseline Array (LBA)
- Global mm-VLBI Array (GMVA) - observer



GVA participant networks (II) – comparison



VLBI Network	Access	Proposals Types	Proposals tool and deadlines	Projects active period	Observing Cycles	Scheduling	Proprietary period
EVN	Open sky Scientific merit and technical feasibility	Regular (disk, e-VLBI, trigger, out-of-session & globals); ToO; Short observations Joint observations for global VLBI	EVN NorthStar February, June & October ToO & short (and manual triggers) any time by e-mail to PC chair	1 year (9m automatically triggered e-VLBI projects)	3 observing sessions (3-4 weeks each) 10 e-VLBI sessions (24h each) 10 out-of-session (144h/yr)	Fixed dates Dynamic for automatically triggered e-VLBI, 10min response	1 year from data release ToO 6 months
EAVN	Open-use on share-risk basis Scientific merit and technical feasibility	Regular, Large Projects, ToO (trigger and DDT)	EAVN website in latex format June & November	1 year for triggers	2 semesters: (500h/yr) A=mid-Jan / mid-Jun B=Sep/mid-Jan	Fixed dates	18 months from data release Raw data deleted 1 month after correlation



GVA participant networks (III) - comparison



VLBI Network	Access	Proposals Types	Proposals tool and deadlines	Projects active period	Observing Cycles	Scheduling	Proprietary period
VLBA	50% open sky Scientific merit and technical feasibility GBT time and VLA time very limited, well justified.	Regular; Large; Triggered; Directors' Discretionary Time (DDT, 5% of total) for a ToO or Exploratory Time Joint programmes with XMM, Chandra, FERMI, Swift and HST	NRAO PST or EVN NorthStar for VLBI Global February & August DDT any time using PST	1 year	2 semesters: A=Feb/end-Jul B=Aug/end-Jan	Dynamic Fixed dates for Global VLBI	1 year from last observation ToO 6 months

GVA participant networks (IV) - comparison



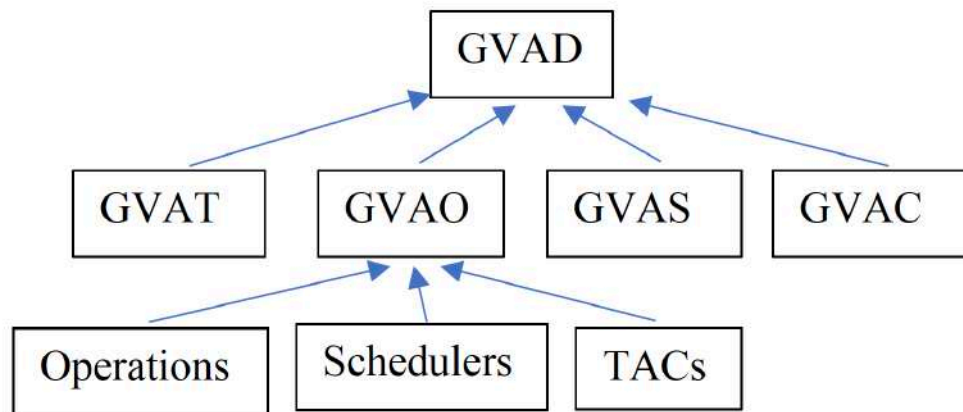
VLBI Network	Access	Proposals Types	Proposals tool and deadlines	Projects active period	Observing Cycles	Scheduling	Proprietary period
LBA	Open sky but limited number of VLBI sessions (plus ATCA & Parkes private projects) Scientific merit and technical feasibility	Standard; Time critical (ToO and triggered NAPA); Director's time	ATNF OPAL Mid-Dec & Mid-June ToO (and Director's) any time by e-mail to ATNF Alert group	1 year	2 semesters: (21 days/yr) I=Apr/end-Sep II=Oct/end-Mar	Fixed dates For ToO and NAPA no fast response Time lost due to overrides or failures to be replaced	18 months ToO additional rules: publish results 1 week after observation to retain data rights Approved proposals coversheet and targets list made public



D10.2 - Operational plan for inclusion of SKA in Global VLBI

<http://jumping.jive.eu/exec/d10.2.pdf>

Global VLBI Alliance – structure



- GVAD: Directors
- GVAS: Science forum
- GVAT: Technical forum
- GVAO: Operations team
- GVAC: Communications team

How to set a Global VLBI Alliance?

- As a Working Group in IAU B4

https://www.iau.org/science/scientific_bodies/commissions/B4/



- Proposed structure:

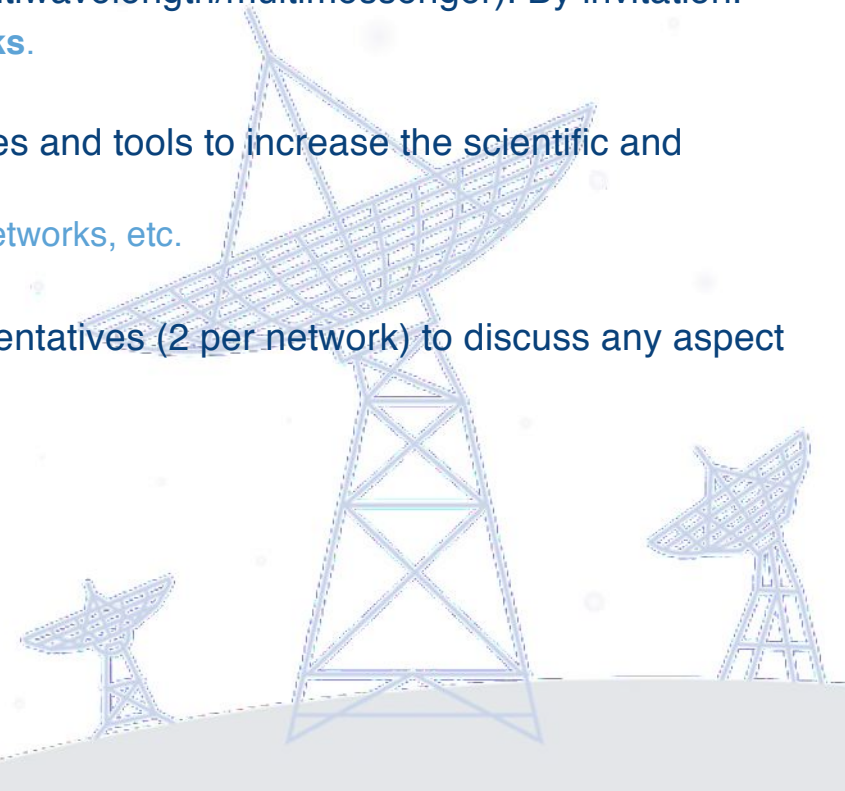
- Science Forum (GVAS): evaluates and fosters the unique and complementary contribution of VLBI to astrophysical research. **Open to the whole IAU**, members are active scientists, not necessarily linked to any of the VLBI networks in the GVA.
 - Promotes cross-fertilization, events, training opportunities
- Technical R&D Forum (GVAT): discusses opportunities and coordinates the development of new instrumentation or procedures.
 - Mitigation of Radio Frequency Interference (RFI)
 - A natural extension of the current IVTW, with "helicopter view" by the chairs of the network TOGs

How to set a Global VLBI Alliance? (II)



• Proposed structure (cont):

- Operations and Logistics Team (GVAO): facilitates and coordinates observations scheduled with several VLBI networks, or with participation of third-party instruments (e.g. multiwavelength/multimessenger). By invitation.
 - Joint observations may require a **MoU among the VLBI networks**.
- Communication and outreach Team (GVAC): coordinates activities and tools to increase the scientific and societal impact of VLBI. By invitation.
 - Setting a “GVA web” as common entry point, newsletter, social networks, etc.
- GVA Director’s Forum (GVAD): VLBI network directors or representatives (2 per network) to discuss any aspect of the global cooperation. By invitation.
- The GVAS, GVAT, GVAO and GVAC, all report to the GVAD.



Collaboration with third-party instruments

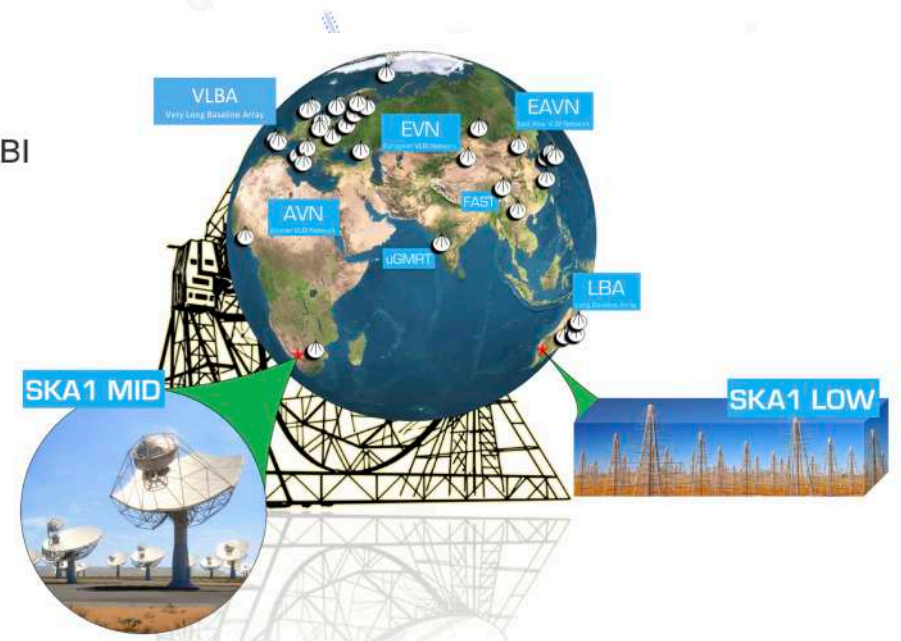


• SKA-VLBI

- Operational model for **VLBI with the SKA**, facilitated by JUMPING JIVE
- Setting an SKA-VLBI Consortium



- D10.1 - Details on VLBI interfaces to SKA consortia
- D10.2 - Operational plan for inclusion of SKA in Global VLBI
- D10.3 - Portfolio of SKA-VLBI Key Science Projects



Timelines



- The GVAD is currently established as a working group in IAU B4
- The GVA teams will be established asap (GVAO, GVAC)
- All astronomers will be invited to join the GVA science forum
- The GVA technical forum will start by invitation to VLBI network representatives, and then it will be open to other interested members
- Stay tuned! Please check:
https://www.iau.org/science/scientific_bodies/working_groups/324/
<http://www.gvlbi.org/> (under construction)

Upcoming events



- C/X band receiver meeting (virtual, April 1st 2021):

- <https://events.mpifr-bonn.mpg.de/indico/event/181/overview>

- EVN mini-Symposium 2021 (virtual):

- <https://www.ucc.ie/en/evn2020/>



**15th EVN Symposium & Users Meeting:
Providing the Sharpest View of the Universe**

**University College Cork, Ireland
July 12-16, 2021**






- URSI GASS 2021 (Rome, hybrid) session J04 “VLBI”:

- <https://www.ursi2021.org/>



- EVN e-seminars:

- <https://www.evlbi.org/evn-seminars>

 Sandra Etoke <i>The sharpest view of the Radio Universe</i> VLBI: Connecting astronomers worldwide 53:31	 Mareki Honma <i>The sharpest view of the Radio Universe</i> VLBI: Connecting astronomers worldwide 56:41	 Kenzie Nimmo <i>The sharpest view of the Radio Universe</i> VLBI: Connecting astronomers worldwide 59:20	 Yuri Kovalev <i>The sharpest view of the Radio Universe</i> VLBI: Connecting astronomers worldwide 1:00:51	 Cristiana Spingola <i>The sharpest view of the Radio Universe</i> VLBI: Connecting astronomers worldwide 55:26
EVN Seminar: Distance of optically-obscured evolved...	EVN Seminar: Galactic Maser Astrometry with Very Long...	EVN Seminar: Pin-pointing the positions of repeating...	EVN Seminar: VLBI as a key to the origin of high-energy...	EVN Seminar: Using Strong Gravitational Lensing to...

Logos: JIVE Joint Institute for VLBI ERIC, European VLBI Network, UCC University College Cork, Ireland.

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