The Global VLBI Alliance

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and YOU

Global VLBI Working Group Meeting

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Abstract

The Global VLBI Working Group (GVWG) will meet during Splinter Meeting Session J07 at the 2008 URSI General Assembly. Members of the GVWG are urged to participate, and any other interested persons are very welcome to attend.

The meeting will consist primarily of open discussions, rather than set presentations. A few brief presentations on specific developments will be solicited as necessary by the GVWG Chair. The discussions will be organized around the three tasks specified in the GVWG's Terms of Reference:

1. To develop a concept for an International VLBI Network, comprising existing or future national and regional networks.
2. To promote compatibility of technology in VLBI instrumentation.
3. To serve as a liaison between ground-based observatories and national or international space agencies, for coordination of participation by ground radio telescopes in Space VLBI missions.

The current status and recent progress will be summarized for each task, and proposals for future work will be considered.

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Commission B4 WG Global VLBI Alliance

Description

Very Long Baseline Interferometry (VLBI), by its very nature, has always depended on international collaborations. Nowadays several formal VLBI networks exist, which in turn regularly form combined arrays. A **Global VLBI Alliance** (GVA) facilitates the flow of information between VLBI networks, including sharing strategies, technical developments for compatibility, logistics, operations, and user support. It also promotes, proposes and coordinates common observational campaigns with these existing networks, and encourage and support new VLBI activities, while increasing the visibility, scientific and societal impact of VLBI.

The GVA moreover facilitates the interaction with the users, and serves as contact point and framework of collaboration of the VLBI networks and other astronomical facilities, in view of the growing need of multi-messenger studies.

Links:

- WG Triennial Report (2021-2024) - Global VLBI Alliance
- WG Annual Report (2022) - Global VLBI Alliance
- WG Triennial Report (2018-2021) - Global VLBI Alliance

Regular Working Groups, unless re-established by the same procedure, such Working Groups cease to exist at the following General Assembly.

Re-established for the Triennium 2024-2027.

Working Group Members (59)

Under

Commission B4 Radio Astronomy

https://www.iau.org/science/scientific_bodies/working_groups/324/

connecting VLBI worldwide

Welcome

Welcome to the **Global VLBI Alliance** (GVA).

By its very nature, VLBI has always depended on international collaborations. These have led to the formation of several formal VLBI networks, which in turn regularly form combined arrays. The GVA facilitates the flow of information between VLBI networks, including sharing strategies, technical developments for compatibility, logistics, operations, and user support, and also promote, propose and coordinate common observational campaigns with these existing networks. In a multi-messenger scenario, the GVA will serve as contact point and framework of collaboration of the VLBI networks and other facilities. Additionally, it can encourage and support new VLBI activities. The GVA will also facilitate that adequate information is provided to the users by this unique common portal.

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 and Korean 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)

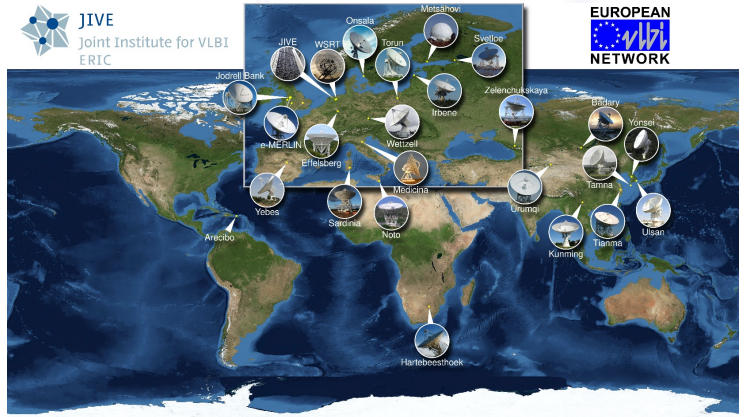
- To **share information** in a timely and structured way between VLBI networks
  - Strategic developments (also to exploit *complementarity*)
  - Science vision
  - Technology paths
  - Proposal types, deadlines and evaluation
  - Logistics
  - Scheduling
  - And keep inventory of the developments

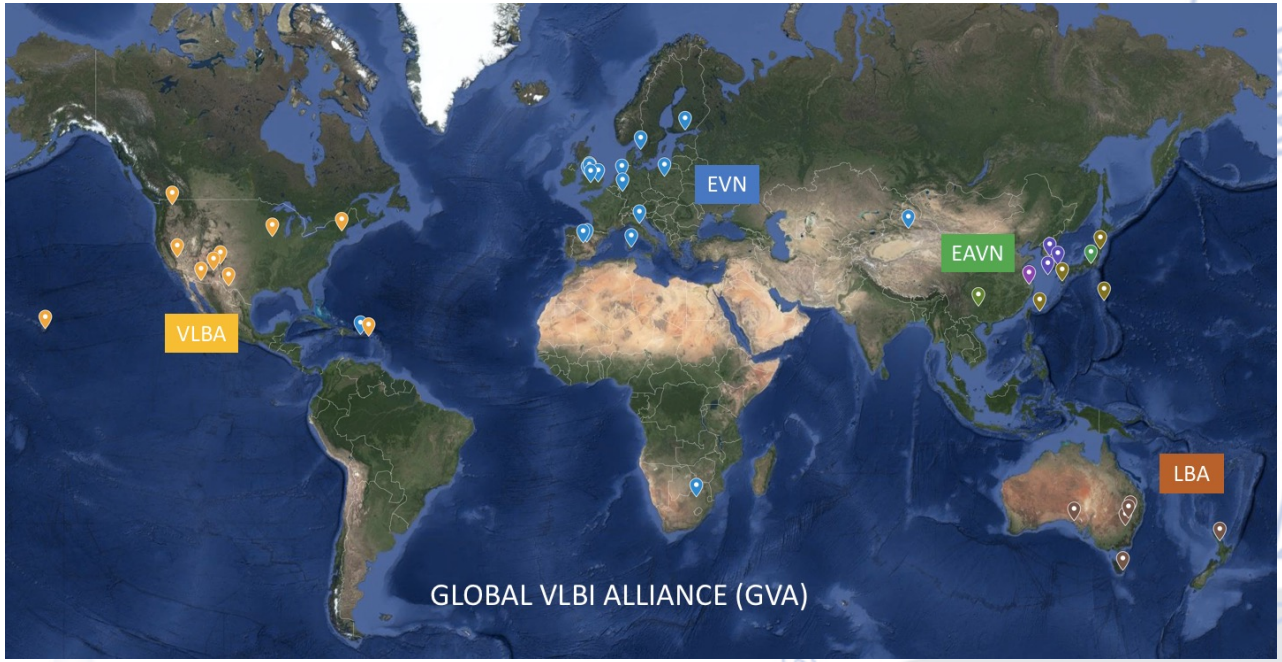
- For (non-expert) users and other stakeholders to have a clear and **visible entry/contact point** to the VLBI facilities
  - GVA web
  - Extended user support (also among networks)
  - Support to new facilities and groups (e.g. in Africa-AVN, Latin America-IVIA)
  - Education and outreach of VLBI

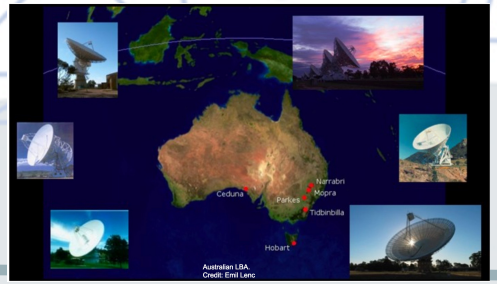
- Also to **coordinate joint observations** (but not only)
  - In particular with third-parties instruments (multi-messenger, SKA-VLBI)

GVA participant networks

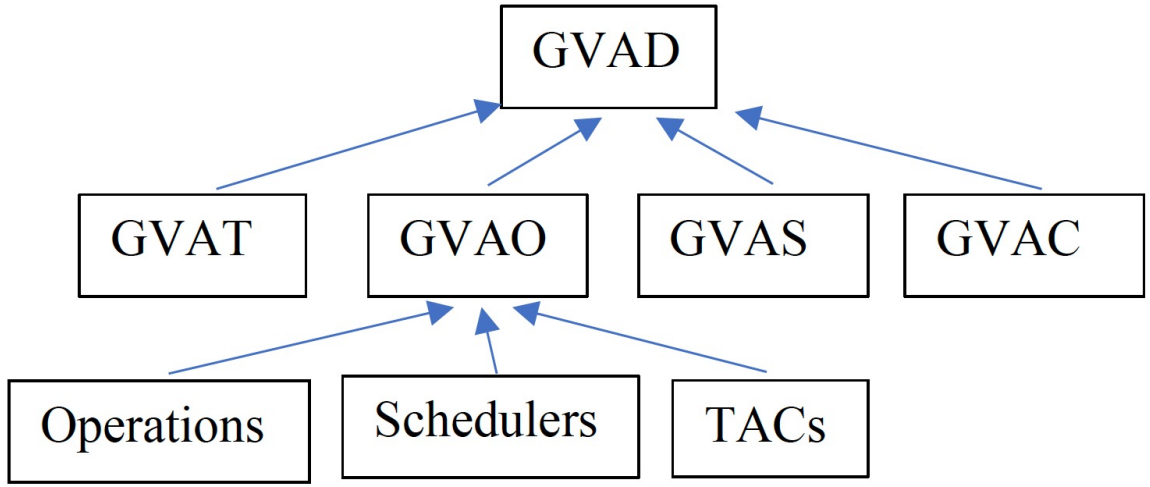
- Very Long Baseline Array (VLBA, USA)
- European VLBI Network (EVN/JIVE)
- East Asian VLBI Network (EAVN)
- Southern Hemisphere Long Baseline Array (LBA)
- *Global mm-VLBI Array (GMVA) - observer*







Global VLBI Alliance – structure

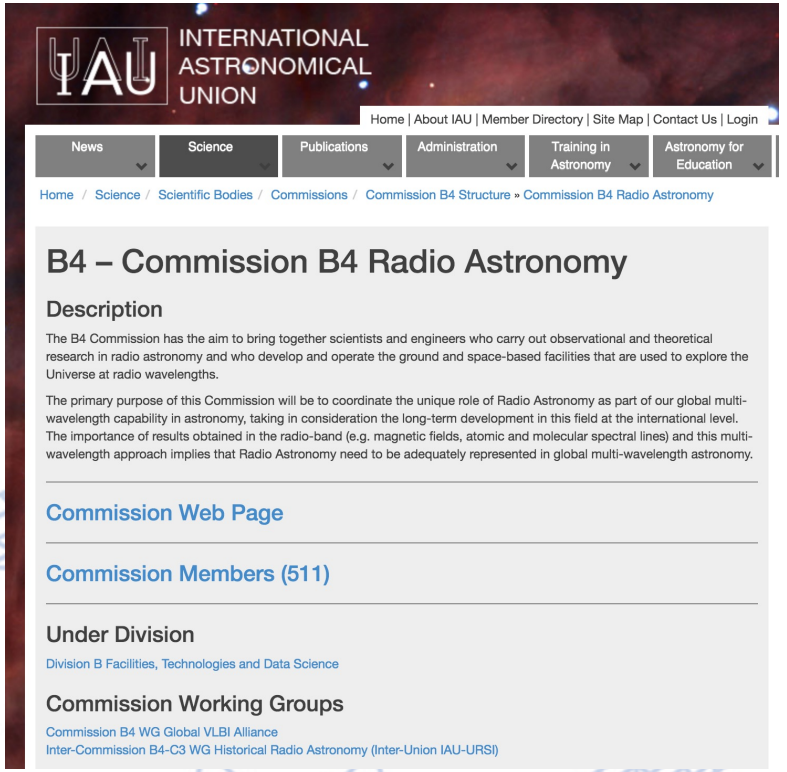


- GVAD: Directors
- GVAS: Science forum
- GVAT: Technical forum
- GVAO: Operations team
- GVAC: Communications team

GVA structure (2)

- **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
    - Working Group in IAU B4

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



- 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

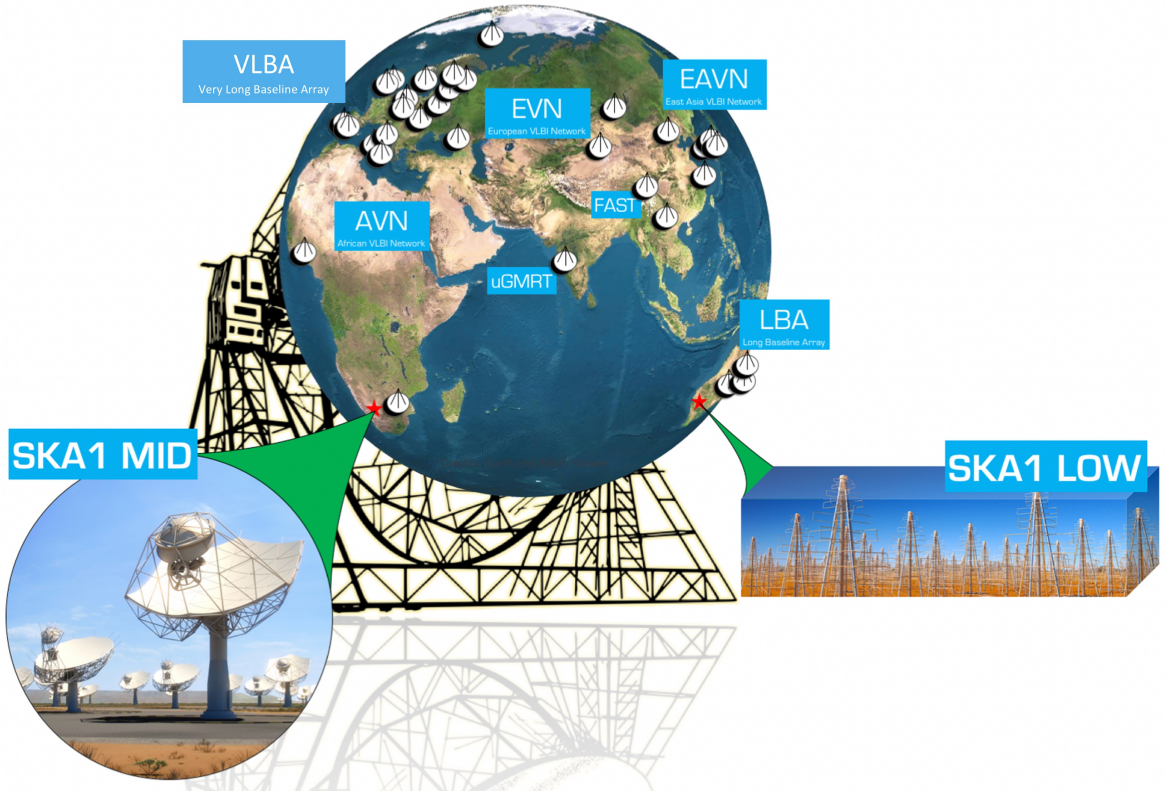
GVA structure (3)

- ~~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.

SKA-VLBI

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

- 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



- Setting an *SKA-VLBI Consortium*
  - To engage with SKA R&D and Operations
  - Provide VLBI equipment to SKA sites
  - Data transfer and correlation
  - User support

There is already a tentative list of topics where the GVAT could coordinate and be the "standardising body" of:

1) Data format specifications: VDIF/CODIF and the upcoming "timebomb", RDEF support?
2) Maintainer of VEX format (and possibly others, such as IDI-FITS, Mark4/HOPS4, ...)
3) Maintainer of station codes
4) Requirements capture and interaction with the CASA / RADPS group
5) Requirements capture for correlators (e.g., to provide standards against which compliance testing can be done)
6) Baseband voltage distribution policy guidelines (both physical media and e-transfer)
7) E-transfer protocols and best practice
8) Interaction w/ next-gen arrays (SKA, ngVLA)