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The Global VLBI Alliance (GVA)

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By its very nature, VLBI has always depended on international collaborations. These efforts have led to the formation of several coordinated VLBI networks, which, in turn, regularly combine to form larger arrays. The Global VLBI Alliance (GVA) facilitates the flow of information between VLBI networks, including the sharing of strategies, technical developments for compatibility, logistics, operations, and user support. It also promotes and coordinates common observational campaigns with existing networks.

In a multi-messenger scenario, the GVA serves as a contact point and a framework for collaboration between VLBI networks and other facilities, such as the SKA, Cherenkov Telescope Array, and ngVLA. Additionally, it aims to encourage and support new VLBI initiatives. The GVA also ensures that adequate information is provided to users through this central portal.

The GVA is overseen by a Directors Forum, which includes representatives from the European VLBI Network (EVN), NRAO's Very Long Baseline Array (VLBA), East Asian VLBI Network (EAVN), and the Southern Hemisphere Long Baseline Array (LBA). New networks may be admitted upon approval by the Directors Forum. Under the Directors Forum are the Science Forum (GVAS) and Technical Forum (GVAT). Membership in GVAS and GVAT is open to any scientist, engineer, or technician with a professional interest or involvement in VLBI, regardless of affiliation with a GVA network.

The GVAS is organized under IAU Commission B4 as a working group and provides a platform for scientists to identify needs and engage in discussions on how to ensure VLBI facilities remain responsive to the latest astronomical challenges. It enables participation in and contributions to long-term network roadmaps. Scientists involved can evaluate synergies between VLBI facilities and leverage the unique and complementary characteristics that enhance VLBI's contribution to astrophysical research. These include differences in frequency coverage, angular resolution, sensitivity, observational cadence, real-time capabilities, and access to different regions of the sky.

The GVAT discusses opportunities and helps coordinate the development of new instrumentation and procedures. A primary goal is to make VLBI networks sufficiently compatible to enable joint observations, requiring common frequency bands, standardized data transport and formatting protocols, and harmonized storage systems. The GVAT also evaluates how best to meet VLBI user expectations, as outlined in science vision documents—from developing state-of-the-art instrumentation to optimizing observational logistics. Collaborative efforts to improve sensitivity, survey speed, agility, frequency range, and post-processing capabilities benefit all VLBI networks.

There is considerable interest among astronomers in truly global VLBI observations. Over 2023 and 2024, there were eight global experiments with a total observing time of 143 hours and up to 33 telescopes participating in a single experiment. The GVA's goal is to promote and facilitate such observations.