

AFOSR/ITC Indo-Pacific/ONRG – NRF Korea Quantum Sensing Science and Technologies

2025-2028

The National Research Foundation of Korea (NRF), in collaboration with the United States (U.S.) Tri-Services (Asian Office of Aerospace Research & Development (AOARD), U.S. Army International Technology Center Indo-Pacific (ITC Indo-Pacific), and U.S. Office of Naval Research Global (ONRG)), announces the solicitation for a three-year program co-funded by these organizations.

History

The NRF has enjoyed a 15-year relationship with the United States Air Force and its sister services in support of basic scientific research. To further encourage collaboration between scientists and engineers in both countries within emerging technology areas, and to leverage their combined intellectual resources, NRF, AOARD, ITC, and ONRG are pursuing parallel programs in Quantum Sensor Science and Technologies.

Eligibility and Collaborative Funding Opportunity

This program is an open call for proposals seeking to foster research partnerships between leading academic institutions in Korea and the U.S. The NRF and the U.S. Tri-Services seek innovative basic research proposals from Korean-led teams to study quantum phenomena which will enable next-generation sensing capabilities and paradigms, particularly for national security applications.

Applications that will benefit from new basic research include, but are not limited to:

- Quantum electromagnetic sensors
- Quantum inertial sensors
- Atomic clocks across all scales, from chip-sized (microsecond precision) to liter-sized (picosecond precision)
- Optical clocks
- Quantum gravimetry
- Quantum magnetometry
- Quantum imaging, metrology, and other approaches to exploit entanglement (in air, on land, or undersea)
- Any fundamental science enabling these or other quantum sensing applications

Proposal Requirements:

- **Eligibility:** Teams must have co-principal investigators (co-PIs) from academic or non-governmental institutions: one based at a Korean institution, and one at a U.S. institution. The Korean institution will serve as the lead PI.
- **Relevance:** Proposals should demonstrate a clear pathway towards advancing fundamental science related to quantum sensing for national security applications, providing strategic advantages in sensing, communication, and navigation.
- **Impact:** Novel approaches or investigations are favored over incremental advancements.

Submission Process:

- **Stage 1 - White Paper:** Teams will submit a white paper (maximum 3 pages) outlining their proposed research project, including research objectives, methodology, and expected outcomes. See Part II for the white paper template.
- **Stage 2 - Full Proposal:** Based on the evaluation of the white papers, semi-finalist teams will be invited to submit full proposals to NRF, including detailed research narratives and separate budget justifications from both the Korean and U.S. collaborators.
- **Stage 3 – Final Evaluation:** Finalist candidates will be down-selected and asked to complete additional administrative tasks for the U.S. Joint-Services to facilitate final technical and administrative review prior to award decisions.

Selection Criteria:

- Technical merit of the proposed research and development
- Relevance to national security missions
- Unique synergy and collaborative potential of the U.S.-Korean partnership

Funding Level:

All funding is estimated and based on budget availability of both the U.S. and Korean governments. We anticipate awarding approximately three (3) projects at \$308,000 USD per year for three years. For each project, the Korean institution will be funded up to \$158,000 USD per year, and U.S. institution up to \$150,000 per year.

Year 1 (2026-2027) – \$158,000 USD for Korean lead PIs, \$150,000 USD for U.S. co-PIs

Year 2 (2027-2028) – \$158,000 USD for Korean lead PIs, \$150,000 USD for U.S. co-PIs

Year 3 (2028-2029) – \$158,000 USD for Korean lead PIs, \$150,000 USD for U.S. co-PIs

The specific dates each team will be funded will vary due to the different funding cycles.

Application Process, Timeline, and Submission Information

The proposal submission process is in three stages.

Stage 1 - White Paper: White papers are used to initially evaluate ideas, and minimize the labor and cost associated with the production of detailed full proposals for projects that are unlikely to be supported. The Korean lead-PI will submit a white paper of no more than 3 pages detailing the collaborative technical effort. The white papers should include a statement of the problem, method of investigation, uniqueness of approach, and potential relevance to national security missions closely following templates in Part II. The Title Page (part I) and CVs (Part III) are not counted against page count. White papers should be submitted to the NRF via the IRIS system.

<https://www.iris.go.kr> no later than **30th April 2025, 18:00 Korean Standard Time.**

All submitted white papers will be reviewed by NRF and U.S. Tri-Services representatives. Teams selected to advance to Stage 2 – Full Proposal will be notified by **15 June 2025, 18:00 Korean Standard Time.**

Stage 2 - Full Proposal: Semi-finalist teams will be invited to submit full proposals which will include a narrative of no more than 10 pages. The proposals should include research highlights such as the problem, method of investigation, uniqueness or novelty of approach, synergy value of the specific Korean/U.S. collaboration, coordination plan, personnel exchanges, and relevance to national security missions. Full proposals should also include the following appendices (which do not count against the page count): 1) CV's for both PIs, and 2) separate budget justifications from the Korean lead-PI and U.S. co-PI. Full proposals should be received by **15 July 2025, 18:00 Korean Standard Time** according to guidelines provided at the time of invitation to Stage 2.

Full proposals will be reviewed jointly by NRF and U.S. Tri-Services representatives. Teams selected for Stage 3 - Final Evaluation will be notified **around early September 2025**.

Stage 3 – Final Evaluation:

Prior to award decisions, selected Finalist teams will be asked to complete additional administrative tasks with the U.S. Tri-Services in order to facilitate a final technical and administrative review. Instructions will be provided to Finalist teams upon selection.

Timeline (TBD)

- 28 March 2025 – Publish call for white papers
- 30 April 2025 – White papers are due (obligation of 30 days)
- 15 June 2025 – Invitations for semi-finalists to submit full proposals
- 15 July 2025 – Full proposals are due
- Early September 2025 – Invitations for Finalists to submit for final review
- Late September 2025 – Final awards made

The following items should be discussed between the Korean PI's institution and the U.S. PI's institution:

1. Intellectual property issues
2. Personnel exchanges (faculty and students) to promote collaborative research

Addressing these issues well in advance will expedite the grant process and minimize delays in starting the research collaboration.

Joint Reporting

When awarded, the Korean lead-PI shall submit joint annual and final reports to the NRF and U.S. Tri-Services as required in by the final award paperwork. In addition, mandatory annual program reviews will be held. Both PIs are expected to attend the review and to make a joint oral presentation (to be determined, but likely in Korea). Please ensure to budget for travel to these reviews.

Questions

Questions about this opportunity should be sent to:

NRF: Ms. Lim, Hyerin, star0rin@nrf.re.kr

AFOSR POC: Dr. James Joo, james.joo.1@us.af.mil

ITC Indo-Pacific POC: Dr. Bruno, deHararak, bruno.a.deharak.civ@army.mil

ONRG POC: Dr. Brandon Cochenour, brandon.m.cochenour.civ@us.navy.mil