L3 Study Team FAQ

Prepared for the GWSIG Telecon with Paul Hertz
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- NASA intends to participate as a junior partner in the ESA-led L3 Gravitational Wave mission. This participation addresses a top priority of the 2010 Decadal Survey.
- To this end, NASA is starting a study with a twofold goal:
    1. Investigate possible hardware contributions to the L3 mission within a cost cap of $100-150M; and
    2. Prepare the GW community for the 2020 Decadal Survey.
- A Study Team will be assembled by NASA to conduct the L3 study drawing membership from the US community of scientists and technologists.
- A Dear Colleague Letter will be issued the week of December 7, following a successful LISA Pathfinder launch, to solicit nominations.

Q&A

Q1: You stated in the Draft L3ST Charter that NASA contributions to ESA would be in hardware only. What about other contributions?

A1: NASA wants to make contributions to L3 that enhance the science return, not simply defray European costs. Since Europe has already demonstrated, through the eLISA mission concept, that they can do this mission without NASA, the goal is for the NASA contributions to make this a better and more scientifically productive GW mission than a GW mission without NASA.

The Draft L3ST Charter states that the L3ST would study NASA hardware contributions; it did not state that NASA contributions would be in hardware only. There are multiple components to partnering on another agency's mission. One component is the hardware contributions to the payload and the mission. Other components are necessary for the US community to realize the science benefit of that partnership. Those components include participating in mission and science operations, perhaps a US science center, and support for the US science team and the broader US science community.

Q1.5: Does NASA envision contributions to member states as well? This was the case with L2 Athena.

A1.5: For Athena, NASA is participating in the member state instrument consortia so that we can make contributions to the payload. However those contributions will be made to ESA, not to the member states. This is the same as the arrangement for Euclid, where NASA is contributing the sensor chip systems for the NISP instrument to ESA, and ESA is providing them to the NISP consortium. NASA contributions can be made to either the payload or the mission. In either case, the contributions will be made to ESA.

Q2: I am curious about where the $100M-$150M cost cap comes from? ESA has placed a 20% limit on international contributions, which amounts to about $300M. But either way, it seems too early to restrict NASA's contribution, since the 2020 decadal committee may influence the eventual level. The PhsyPAG report to the Astrophysics Subcommittee encouraged a study that examined a broad range of contribution levels. The main motivation was to provide NASA with an analysis that will enable him to respond to any potential decadal recommendation. Isn't more information better than less?

A2: NASA has approval to pursue a US hardware contribution in the $100-150M cost range. This is limited by what the Administration is willing to commit to beyond the current budget horizon; it is not limited by what ESA is willing to accept. NASA understands the argument that the 2020 Decadal Survey should be given options for a larger contribution. However the current ESA schedule for L3 will lock in payload commitments from the US and European member nations, and possibly other partners, well before the 2020 Decadal Survey is released.

Q3: If the total cost of the hardware contributions in Phase 1 exceeds the cost cap, will prioritization be necessary? How will NASA prioritize the contributions?

A3: NASA is asking the L3ST to analyze options for hardware contributions that do not exceed $100-150M. If the L3ST only analyzes options for hardware contributions that exceed $150M, then it has not done its job properly. It is assumed that the L3ST will suggest prioritizations of various options for hardware contributions. In its November 5 letter to ESA, NASA proposed to contribute hardware in one or more of the following areas:

- Telescope subsystem
- Laser subsystems
- Microthrusters
- Phase measurement subsystem

It seems highly unlikely that NASA could contribute hardware in all of these areas for $100-150M, so the L3ST will have to analyze options, provide pros and cons, and possibly provide prioritizations.

Q4: The cost to NASA depends on the particular choice of mission architecture. Will the L3ST be empowered to do trade studies? You stated that only the basic LISA configuration with 3 and 2 arms will be under study, but we do not know which configuration ESA will pick; we need to be prepared with a full scenario, certainly for the proposal to the Decadal.

A4: The L3ST is not a mission study. The mission belongs to ESA, and ESA will conduct the mission study. As ESA conducts the mission study, NASA will participate, and the L3ST will be NASA’s community-based team for participating in the ESA mission study. NASA does not anticipate presenting the 2020 Decadal Survey with mission architecture options; NASA envisions presenting the 2020 Decadal Survey with the option of participating in ESA’s L3 mission, which will use an ESA-chosen architecture.

Q5: How long will be the term on the L3ST?

A5: ~3 years. Phase 1 will run in FY16 and 17, Phase 2 from FY17 to FY18. NASA anticipates refreshing the L3ST after Phase 1 (after 1.5 years or so) by allowing members to step down and by adding new members. The L3ST will be disbanded after Phase 2, when all necessary input is provided to the 2020 Decadal.

Q6: Are Europeans/other foreigners eligible to serve on the L3ST?

A6: The L3ST is a US study team to study the US contribution to ESA's L3 mission. Applications are solicited from U.S.-persons from U.S.-based research and academic institutions, Government laboratories, industry, and private individuals. (U.S. persons, for the purpose of export control regulations, are U.S. citizens and permanent residents; see http://oiir.hq.nasa.gov/nasaecp/Webbrfg/tsld018.htm). NASA would welcome an ESA ex officio observer on the L3ST, should ESA think it is appropriate. NASA anticipates the L3ST working closely, as appropriate, with its European colleagues. Meetings will be open to the extent allowed by export control and other applicable regulations.

Q7: How will the L3ST members be selected? Which criteria?

A7: NASA will select a mix of skills to ensure that all aspects of science and technology are represented on the Team.

Q8: Can Civil Servants from Centers serve on the L3ST? From Study Office?

A8: NASA civil servants are welcome to apply. However members of the L3 Study Office and the PCOS Program Office will not be members of the L3ST. The L3 Study Scientist, the HQ Program Scientist, and possibly the PCOS Chief Scientist, will be ex officio members.

Q9: How many members of the L3ST are you expecting to select?

A9: In the range of 10 to 15, to allow for a range of expertise and interests.

Q10: Will NASA cover the participant expenses? Will they receive an honorarium for their service?

A10: NASA will cover the cost of travel only. It is anticipated that the L3ST will leverage some F2F meetings on existing conferences, such as, e.g., the APS in April, and will conduct business via remote means as much as it is practical and feasible.

Q12: What is the role of the Study Office vs. the L3ST?

A12: The Study Office will perform the technical and cost assessments in response to the L3ST as appropriate. The L3ST will provide scientific input and parameters for the technical assessments. The L3ST will be responsible for the study's outcomes (reports).

Q13: What are the outcomes of the Study? What will NASA do with them?

A13: At the end of Phase 1, the L3ST will deliver a report to NASA HQ through the Study Office describing the results of the charged tasks. It is envisioned that this report will inform the charge to the L3ST for Phase 2. NASA will use these reports to inform its negotiations with ESA for L3 participation.

Q14: What will Phase 2 entail?

A14: Phase 2 will develop the materials necessary to propose NASA's participation in L3 to the 2020 Decadal Survey. This will likely include an updated science case, a mission description with emphasis on NASA's contribution (or potential contributions, if not finalized by the start of the decadal survey), and appropriate information for the NRC's Cost and Technical Evaluation (CATE) process.

Q15: What will the application material consists of?

A15: The application material will consist of: 1) a 1-2 page cover letter stating the reason for the interest in participating to the L3 Study Team, and relevant experience; 2) a statement of commitment to accomplish the L3ST tasks; and 3) a 1-2 page resume including relevant publications.