

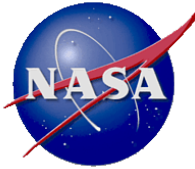
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# The NASA L3 Study

Robin Stebbins, GSFC

GWSIG Meeting

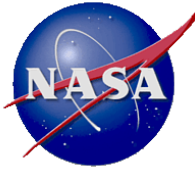
Kissimmee, FL, 4 January 2016



# Topics

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- State of Play
- Purpose of the Study
- Study Timeline
- Study Organization
- Phase 1 Tasks
- Phase 2 Tasks



## State of Play: L3

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- The Astrophysics Implementation Plan calls for a minority role in L3, planned for launch in 2034.
- L3 – The third large mission in ESA’s Cosmic Visions 2015-2025 Programme
  - NASA and ESA have been discussing a collaboration for ~2 years
  - Gravitational Observatory Advisory Team (GOAT)
    - ESA study evaluating and recommend scientific performance trade-offs, detection technologies, technology development activities, data analysis capabilities, schedule and cost
    - US representatives: Guido Mueller, Mark Kasevich, Bill Klipstein, RTS
    - Started in October 2014, concluding with a final report in late March or early April 2016.
  - ESA solicited interest from ESA Member States in November 2015
- NASA is continuing technology development support. ESA is restarting technology development activities.

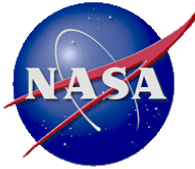




## State of Play: LISA Pathfinder

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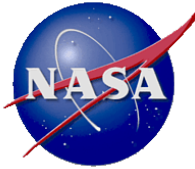
- See Ira Thorpe's talks.
- Outstanding 'conditional' in all major reviews/recommendations
- Launched December 3<sup>rd</sup>. [Applause!]
- Currently in route to operational orbit around L1.
- Commissioning will continue through February
- Baseline operations March-September, extended operations likely.
- ESA will review the success with a separate committee (not GOAT) in late summer or fall.



# State of Play: NAS/NRC Reviews

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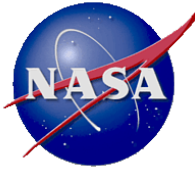
- Midterm Assessment
  - Oct. '15 – First meeting in Washington, DC
  - Dec. '15 – Second meeting/symposium in Irvine, CA
  - Jan. '16 – Final meeting in Washington, DC
  - 1 May '16 – Target delivery date for final report
- 2020 Decadal Survey
  - Likely to begin in late 2018, early 2019
  - Astrophysics Division is initiating a plan to study likely projects with the intention of having well-understood proposals
- This L3 Study is:
  - The realization of the study promised in the plan for the 2020 decadal survey.
  - The study endorsed by the GWSIG, the PhysPAG and the Astrophysics Subcommittee



# Study Purposes

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- Phase 1: To advise Paul Hertz in his negotiations with ESA on a NASA role in L3.
- Phase 2: To prepare a proposal to the 2020 decadal for NASA's role in L3

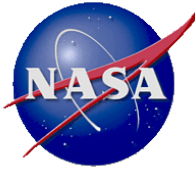


# Study Timeline

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- Dear Colleague Letter soliciting nominations for Study Team member released Dec. 7<sup>th</sup>
- Charter released Dec. 7<sup>th</sup>
  - This draft is focused on the first of two phases
  - The charter will be revised/extended for the second phase.
- Deadline for nominations Dec. 21<sup>st</sup>.
- Selections announced soon after AAS.
- Phase 1 - FY16-17: Analyze the options for NASA participation in the L3 mission and work with the European L3 consortium on proposals to ESA.
- Phase 2 - FY17-18: Prepare a report to the 2020 decadal survey on NASA's participation, including possible options, in the L3 mission as a minority partner.

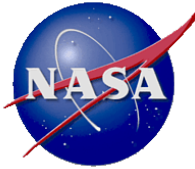




# L3ST Organization (1/2)

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- NASA Headquarters
  - Dr. Paul Hertz, Director, Astrophysics Division
  - Dr. Rita Sambruna, L3 Program Scientist
  - L3 Deputy Program Scientist - Dr. Wilt Sanders
  - L3 Program Executive - Dr. Shahid Habib
- Physics of the Cosmos Program Office
  - PCOS Chief Scientist - Dr. Ann Hornschemeier-Cardiff (GSFC)
  - PCOS Deputy Chief Scientist - Dr. Peter Bertone (MSFC)
  - Study Manager - Steve Horowitz
  - Study Scientist - RTS



## L3ST Organization (2/2)

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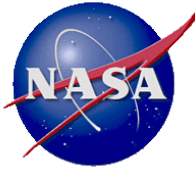
- L3 Study Team (LEST)
  - Received ~30 responses to DCL
  - Will select ~15 researchers
  - Ex-officio ESA observer
  - Mix of instrumentalists, astrophysicists and relativists/data analysts
  - Telecons and open meetings
- Supporting staff from PCOS and the Centers
- Supporting members of the community
  - Technology experts
  - Science performance analyses



# Phase 1 Tasks

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- Potential NASA hardware contributions
  - Initial candidates: telescopes, thrusters, phasemeters, lasers
  - Assessment of needed development, cost, schedule, risk
  - Assessment of science consequences
- Other US activities
  - US science team
  - Data analysis
  - Data distribution
  - Guest investigator program
- Participation in eLISA Consortium, e.g., concept proposal



## Phase 2 Tasks

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- Prepare for 2020 decadal
- Phase 2 task will be detailed further later.
- Prepare science case
- Prepare concept description and NASA's role
- Information for technical readiness, cost and risk assessments
  - Flight segment contributions
  - US science activities
  - Updated technology development status and plans
  - LISA Pathfinder report
- Participation in eLISA Consortium, e.g., payload proposal



# Summary

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- Early activities for L3 are starting up.
- NASA's L3 Study is being set up.
- The L3 Study organization and charter have been established.
- The L3 Study Team is being selected.
- The L3ST tasks have been identified.
- The L3 Study is the agency-supported preparation for the 2020 decadal.