



Overview of the LISA Consortium

LISA Canada Workshop

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- For the LISA Consortium
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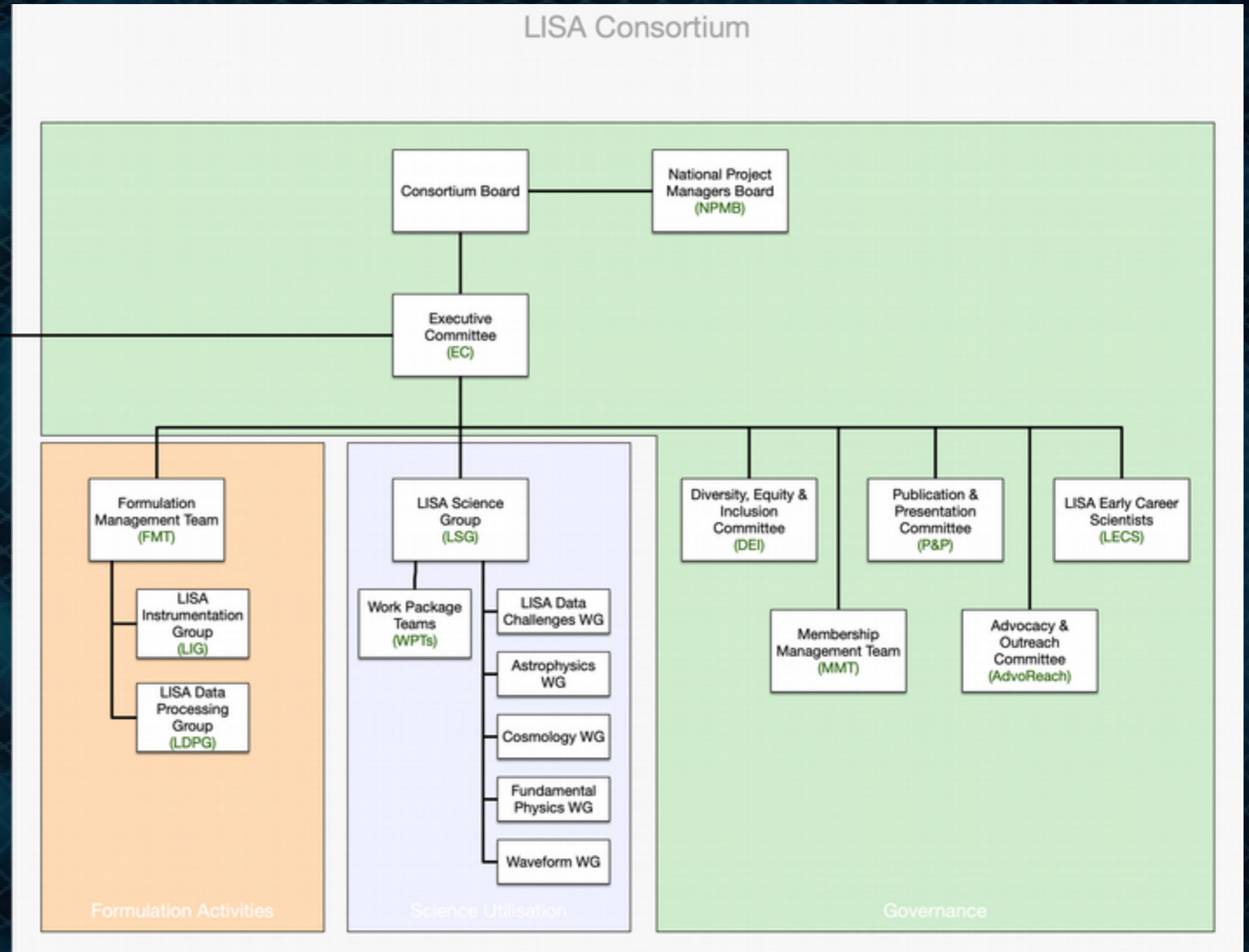
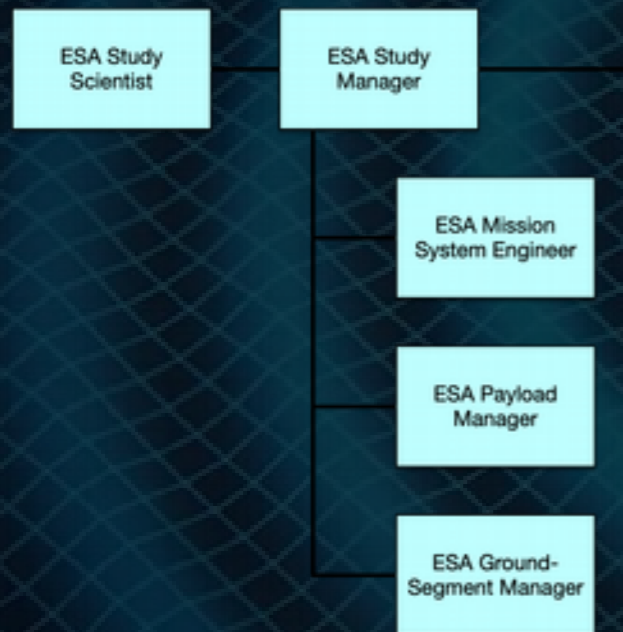
LISA



- ESA (mission lead):
 - Overall mission definition (“architect”), management, and mission performance responsibility
 - Space Segment, Operational Ground Segment and Science Operations Centre development, Launch
- Member States:
 - Development and provision of nationally funded contributions under LISA Consortium umbrella, provision of data processing
 - Nationally funded activities
- NASA:
 - Development and provision of NASA contributions to space segment, ground segment, science ground segment, and to Consortium provided items



LISA Management



Version 1.0
 Note: only formal interfaces are shown

LISA Consortium Fun Facts



- 1400 members
- 726 associate members
- 645 full members
- Total FTE (full members) = 246
- Median FTE (full members) = 0.300000
- 60 Nationalities
- Canada 18

Join The Consortium- Full Member



- Full membership of an external group
 - One or more persons
- Commitment to work - dedicated FTE
- Help shape the mission
- Have full access to all appropriate Consortium information
- Contribute to discussions of mission-critical decisions that the Consortium is allowed to take
 - through working groups



- An association of one or more scientists.
 - Led by a Lead Scientist
- Makes a firm commitment to the work of the Consortium.
- Members of the group are chosen by the Lead Scientist
- All members must be named and put forward to the Consortium Application Review Board for approval.



- Commitment to contribute directly to the goals and work of the consortium.
 - Technology development and design of flight hardware for Consortium deliverables;
 - Performing laboratory tests of parts of the LISA instrument;
 - Development of data analysis pipelines, or parts of one;
 - Management of, or commitment to, one or more work packages;
 - Performing a coordination role.

Consortium- Full Member - Rights



- Access to Consortium IT services, documents, information, products ...
- Data the consortium produces, during development and operations
 - simulated data now, real $h(t)$ later
- Write papers, technical notes, make presentations using LISA Consortium materials
 - Within LISA Consortium Publication & Presentation rules

Legacy Authorship Proposal



- Consortium members earn the right to appear as authors for the Consortium papers presenting the LISA data releases and the results of the key investigations led by the Consortium, upon reaching a threshold of 2 years cumulative FTE
- Work-package deliverables and Consortium processes
 - coordination, governance, advocacy/outreach, project documents, software tools
 - But not toward research articles
- Even if you are no longer in the Consortium

Consortium – Associate Member



- Associate Members will work in the context of the mission but have no obligations and no decision making power.
- Have appropriate access to the Consortium IT, information, products ...
 - according to the groups to which they belong
- Access to LISA simulated data produced within their working group
- Write papers, technical notes, make presentations using LISA Consortium materials
 - Within Consortium Publication & Presentation rules



- Relevant working groups:
 - Measurement Science WG,
 - Waveform Modelling WG,
 - Fundamental Physics WG,
 - Cosmology WG,
 - Astrophysics WG,
 - Advocacy and Outreach WG, and
 - LISA Data Challenges WG.

Join The LISA Consortium



- All applications should be prepared using the templates provided and submitted to the Consortium through the application portal
 - <https://signup.lisamission.org>
- <https://www.elisascience.org/articles/consortium/join-consortium>
- LISA Consortium Application Process
- Straightforward : Group leader, names, working groups, expertise, FTEs

National Involvement



- Discussion with LISA Consortium leadership and ESA
 - Hardware contributions different than scientific contributions
- Good to have regular national meetings to discuss projects
 - In France telecons every 2 weeks
- Constructive to meet with others with common interests and goals.

Evolution of the Consortium



- Mission adoption 2024
 - Good to have tasks defined at that time
- Consortium is young
 - We are still learning and making adjustments
- As we move to launch, observing, and data analysis LISA Consortium will certainly need to evolve
 - Not sure how ...

Read more in



THE GRAVITATIONAL UNIVERSE

A science theme addressed by the eLISA mission observing the entire Universe



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Detailed information at
<http://elisascience.org/whitepaper>

The last century has seen enormous progress in our understanding of the Universe. We know the life cycles of stars, the structure of galaxies, the remnants of the big bang, and have a general understanding of how the Universe evolved. We have come remarkably far using electromagnetic radiation as our tool for observing the Universe. However, gravity is the engine behind many of the processes in the Universe, and much of its action is dark. Opening a gravitational window on the Universe will let us go further than any alternative. Gravity has its own messenger: Gravitational waves, ripples in the fabric of spacetime. They travel essentially undisturbed and let us peer deep into the formation of the first seed black holes, exploring redshifts as large as $z \sim 20$, prior to the epoch of cosmic re-ionisation. Exquisite and unprecedented measurements of black hole masses and spins will make it possible to trace the history of black holes across all stages of galaxy evolution, and at the same time constrain any deviation from the Kerr metric of General Relativity. eLISA will be the first ever mission to study the entire Universe with gravitational waves. eLISA is an all-sky monitor and will offer a wide view of a dynamic cosmos using gravitational waves as new and unique messengers to unveil The Gravitational Universe. It provides the closest ever view of the early processes at TeV energies, has guaranteed sources in the form of verification binaries in the Milky Way, and can probe the entire Universe, from its smallest scales around singularities and black holes, all the way to cosmological dimensions.

<https://arxiv.org/abs/1305.5720>

<https://arxiv.org/abs/1702.00786>

LISA Laser Interferometer Space Antenna

A proposal in response to the ESA call for L3 mission concepts

Lead Proposer
Prof. Dr. Karsten Danzmann