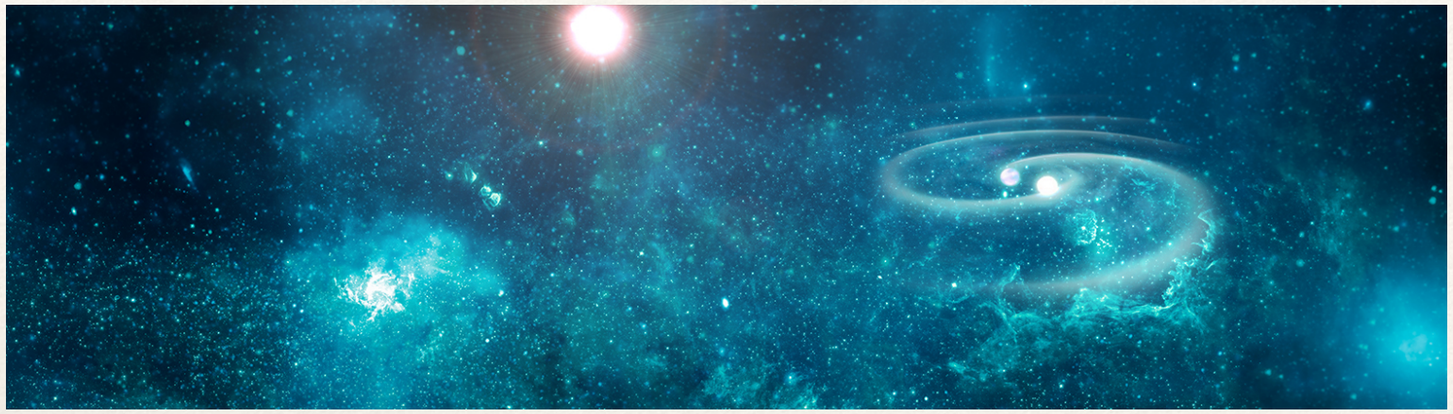
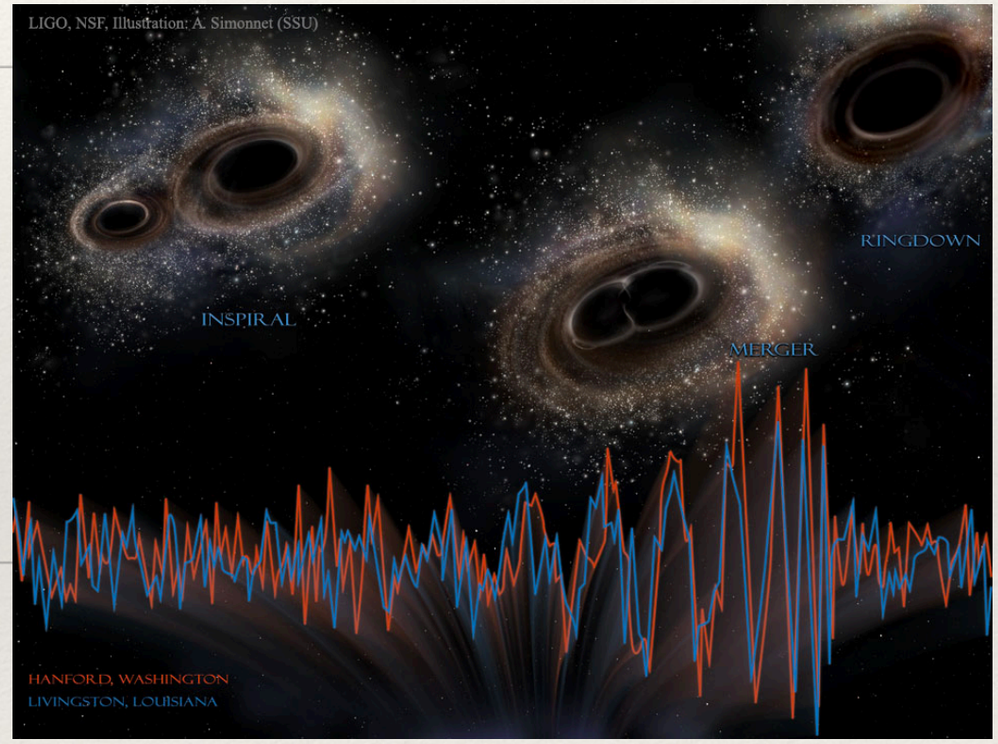
Stanislav Babak.

AstroParticule et Cosmologie, CNRS (Paris)

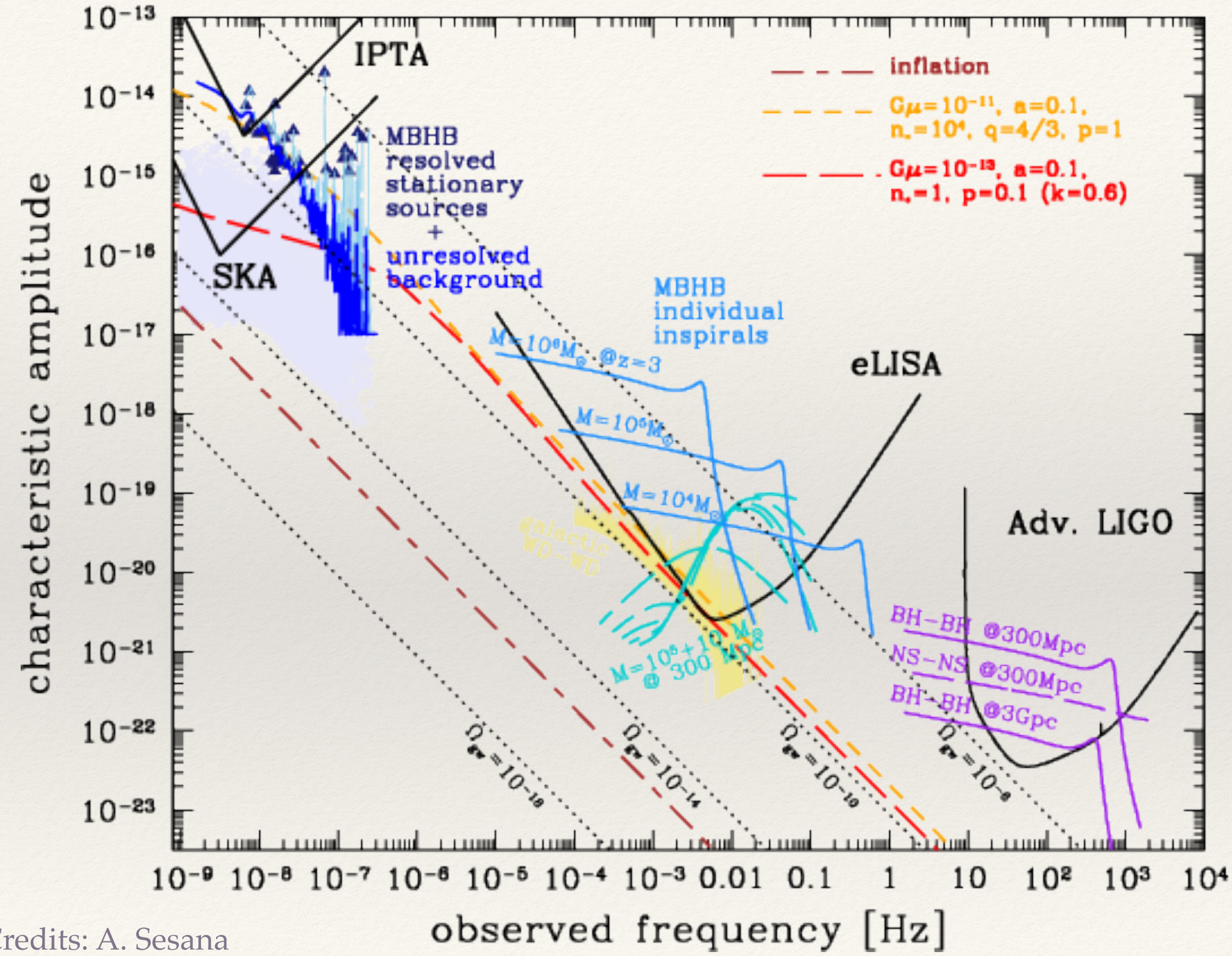




LISA: listening to the Universe from space

Annecy, 12-13 November

GW landscape

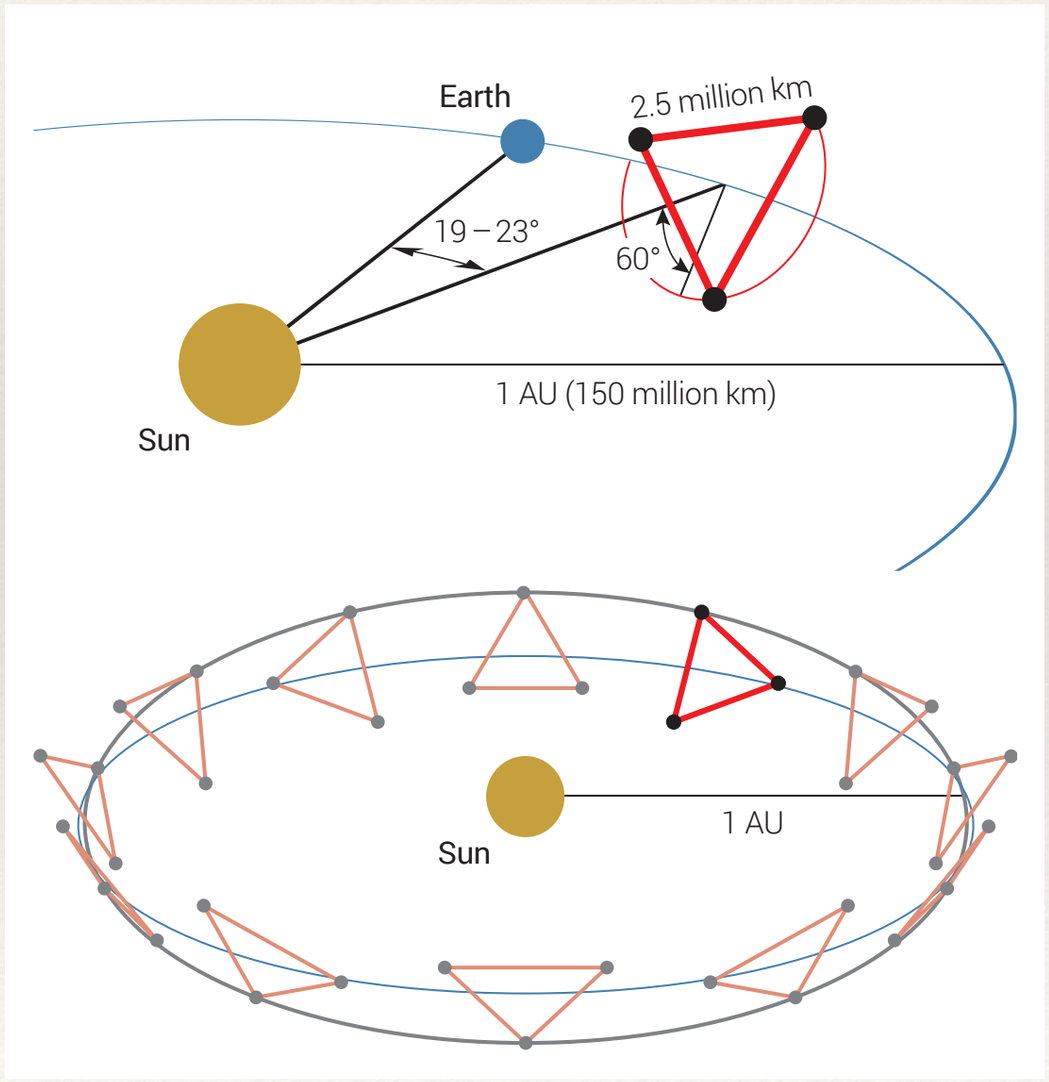


Credits: A. Sesana

Laser Interferometer Space Antenna (LISA)

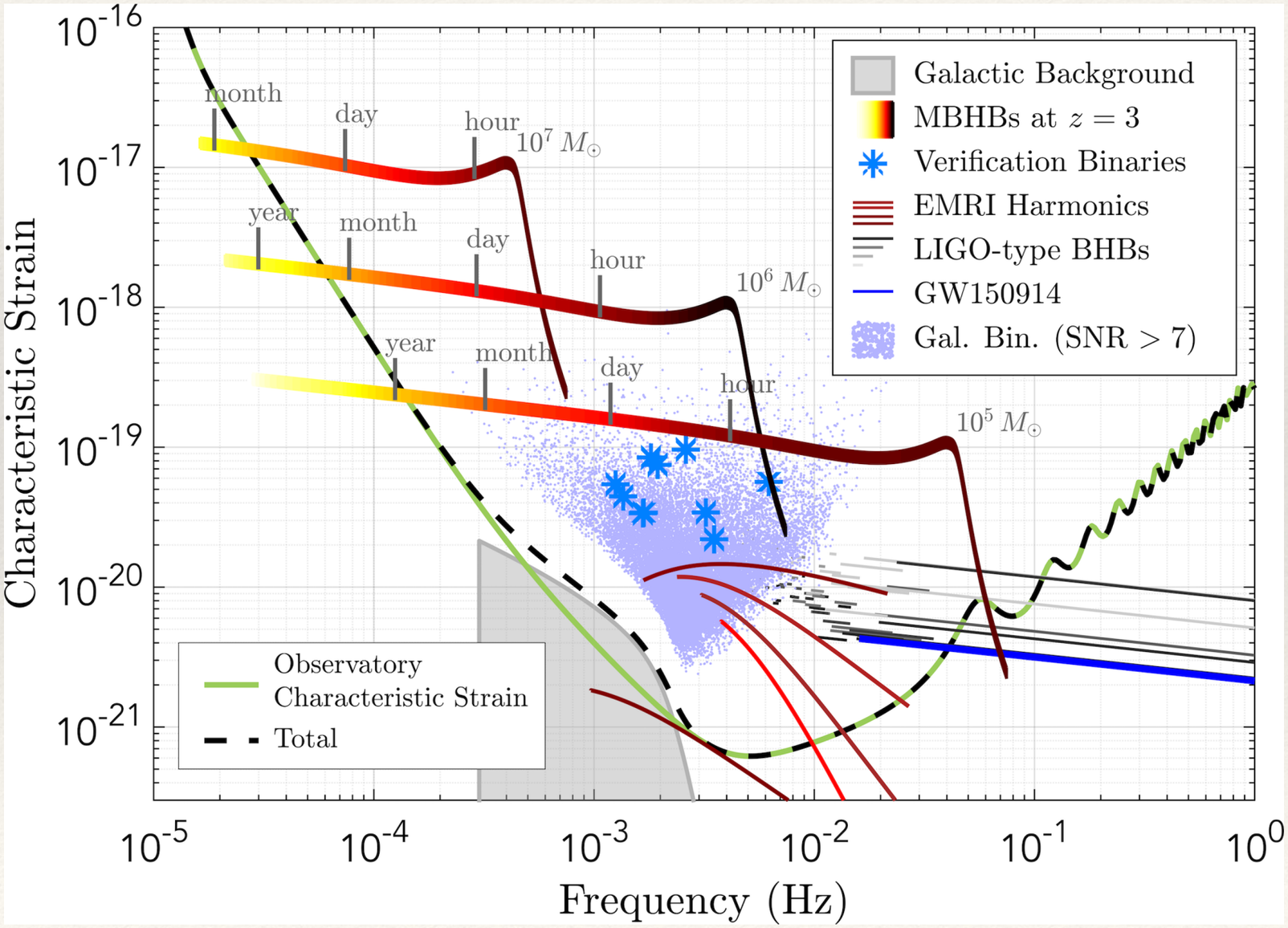
- LISA: GW observatory in space. Launch data 2032-2034

- LISAPathfinder - Technology mission to demonstrate technical readiness of LISA - one of the most successful ESA mission.

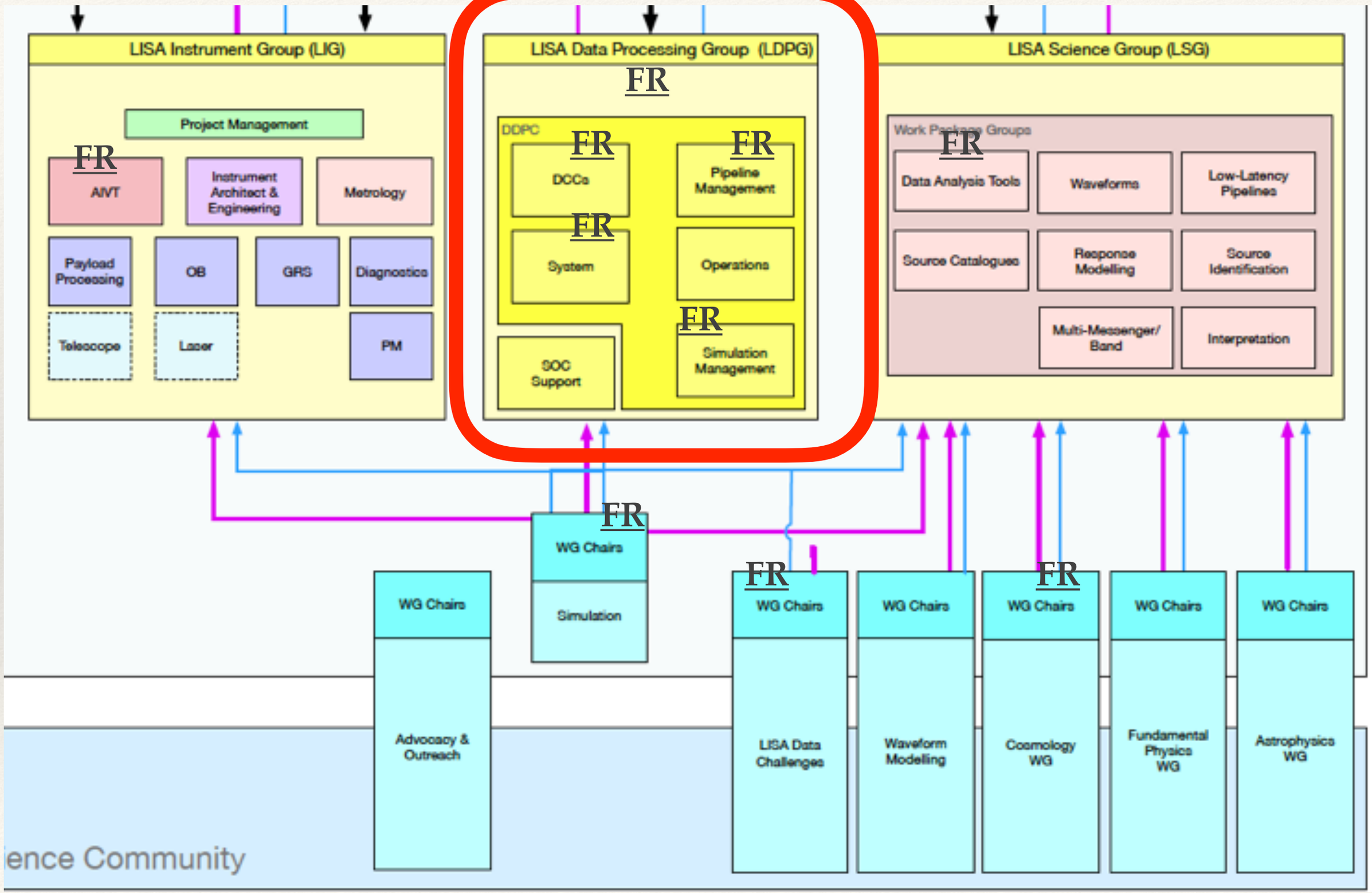


What is special about LISA data

- GW signals are long lived (monts-years) and strong
- LISA data will contain thousands of GW signals simultaneously present in the data (overlapping in time and in frequency). We need to separate and characterize each signal.



France leadership/coordination in LISA consortium



LISA time line

lisa

June 2017: Selection of LISA as L3 with anticipated launch at 2034

May 2018: Phase A kick-off

2018 – 2020 Mission Phase A

spring 2020: Formulation review (end of Phase A)

>2020: Mission Phase B1

2023: Mission Adoption

>2024: Mission Implementation (Phase B2/C/D)

<2034: Launch

Director of science @ESA has explicitely said that he wants LISA (together with ATHENA) in 2032

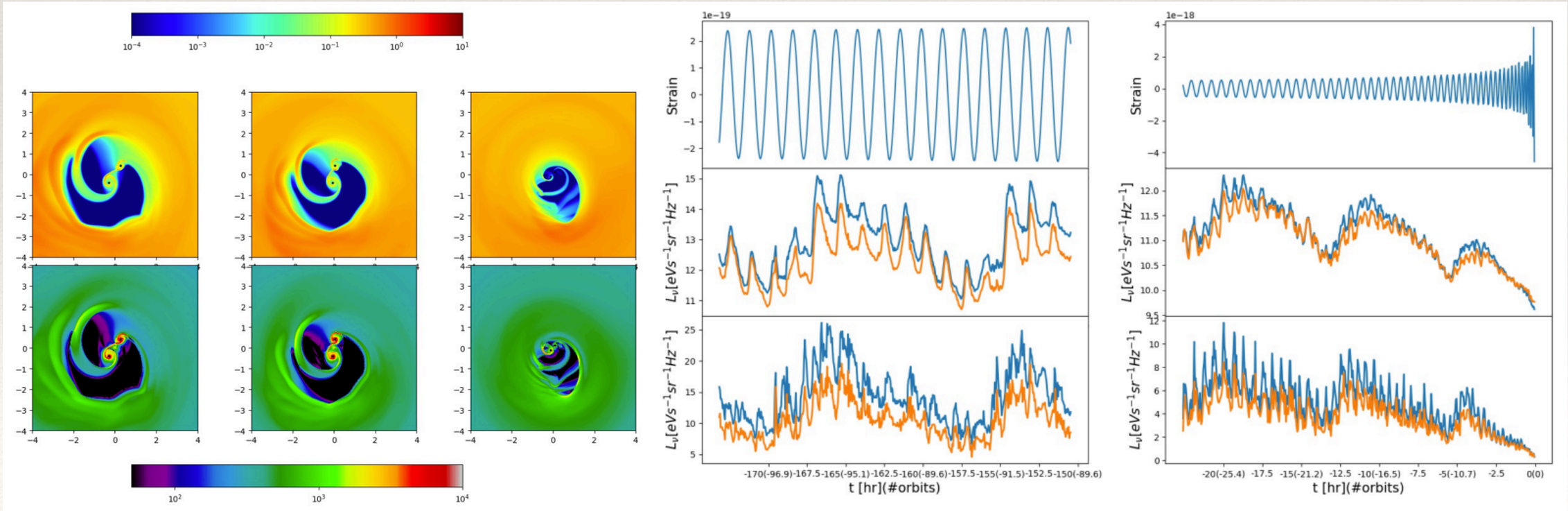
>Launch: 6.5 years operation (with potential extension)

Pre-merger e/m signal

X-ray emission during the late stages of the inspiral (days to hours before final merger) comes from:

- Circumbinary disc:
  - X-ray emission in soft x-rays (≤1keV)
- Mini-discs around black holes
  - Hard x-ray emission (≥10keV) from accretion of minidiscs individually onto each black hole
- Interaction of circumbinary and mini discs:
  - Accretion of circumbinary disc onto mini-discs via optically thick streams
  - Thermal radiation dominated by the inner edge of thecircumbinary disc, producing soft x-rays (~2keV)

- X-ray emission shows clear modulation on timescales as short as a few hours



Y. Tang+, MNRAS 2018