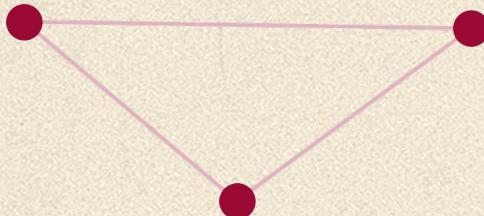


LISA is Cool

LISA @APC
Stas Babak



The team

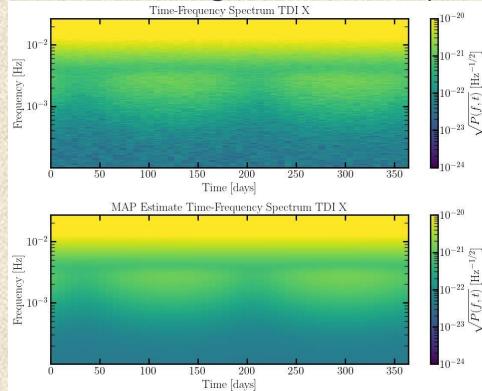
Hubert Halloin	MdC	0.5
Harer Shivani	PhD 2022	
Maxime Vincent	PhD 2023	
Thomas Zergueras	IR	1.0
Joseph Martino	IR	0.9
Mathieu Laporte	IR	1.0
Anne Daumas	IR	0.5
Eric Phuong	CDD IR 2023	
Mathieu Riard	CDD IR 2025	
Lucas Pardessus	PhD 2025	

Stas Babak	DR	0.7
Eric Plagnol	DR	0.5
Danièle Steer	Pr	0.1
Sylvain Chaty	Pr	0.1
Quentin Baghi	MdC	0.4
Senwen Deng	PhD 2022-25	
Hippolyte Quelquejay	PhD 2022-25	
Saptarshi Ghosh	PhD 2024	
Sara Manzini	PhD 2023	
Lukas Arda	PhD 2026	
Giorgio Mentasti	Post doc 2025	
Andrea Sartirana	IR	0.8
Maude Le Jeune	IR	0.8
Philippe Bacon	IR	0.3
Jules Perret	CDD IR 2026	
Gaël Servignat	CDD IR 2025	
Youness Essabri	appr 2024	

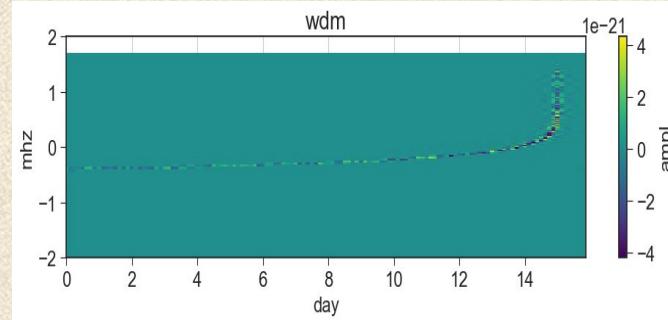
On-going work 1: Global fit R&D

- Non-stationary noise (Quentin, Giorgio)
 - Time-frequency representation of cyclo-stationary stochastic GW signal and noise
- Time-frequency formulation of GW signal from massive black hole binaries (Stas & Jules)
- Time-frequency formulation of Galactic binaries (Stas)
- Time-frequency representation of EMRI (Saptarshi, Gael, Quentin)
- Time-frequency representation of stellar mass BBHs (Gael)
- Tools: new Bayesian tools for assessing significance of GW signals (trans-dimensional continuous time Markov Chain sampler) (Andrea, Maude, Stas)

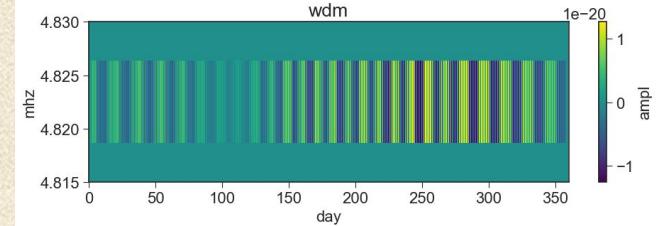
Non-stationary noise time-freq.



Merging MBHB in time-freq.

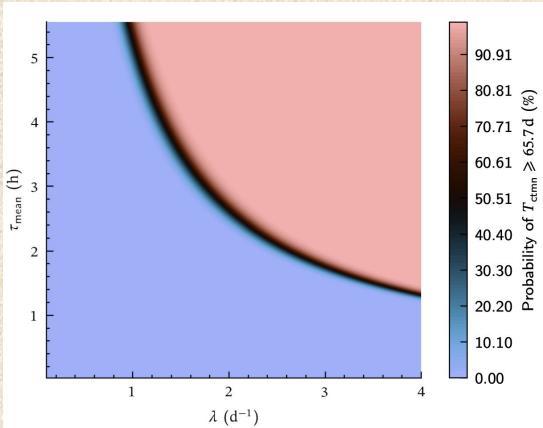


Inspiralling Galactic binary in time-freq.

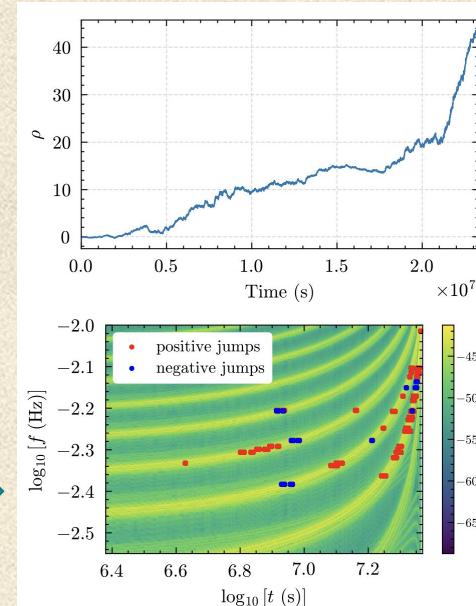


On-going work 2: LISA science exploitation

- Contamination of GW signals by instrumental artifacts (gaps and glitches). (Senwen)
- Self-contamination of MBHBs (overlapping mergers) (Senwen)
- Detection of stellar mass black holes and extreme mass ratio inspirals (Saptarshi, Gael)
- Cross-talk between EMRIs and Galactic binaries (Stas)
- Separation of environmental glitches and astrophysical GW transients (Shivani & J-B)
- Dirty EMRIs (Lukas)
 - Quasi-periodic eruptions as EMRI precursors
 - 2-body relaxation and cliff-hanging EMRIs: estimation of the EMRI event rate
 - Burst of EMRI formation in wide MBHBs
 - EMRIs in dark matter spikes

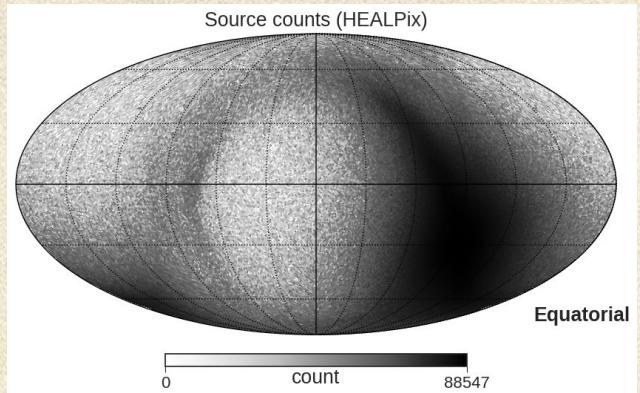
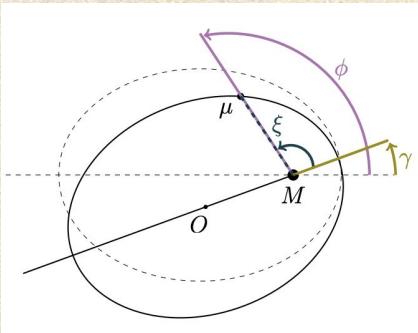


- Probability of losing 66 days of data as function of glitch rate and their duration
- False EMRI detection triggered by a population of loud Galactic binaries



On-going work #3.

- ANR GalaxyFit (Quentin, in collab. with Observatoire de la Côte d'Azur) (Quentin, Giorgio)
 - Overall goal: extracting astrophysical information from LISA data to constrain binary evolution & population models in the Galaxy
 - Use global fit outputs to do it, with increasing level of realism in simulations
 - Assess the impact of the choice of detection criteria in building the catalogs
- Detection of GW backgrounds: assess the impact of noise modelling on SGWB searches (Quentin)
- Development of alternative noise reduction techniques (Quentin, collab. with NASA Goddard)
 - Goal: bring data-driven principal component interferometry (PCI) to the next readiness level
- Model of eccentric binaries: stellar mass black holes and binary neutron stars (Sara)
- Machine learning in modeling Galactic population (priors) (Eric)
- **LISA LLM**: all you want to know about LISA



Others

- Hope to grow in the group: CRCN
- Co-organisation of meeting (EMRIs) in Singapour
- Co-organising MBH-Waves meeting in Italy
- Manuel Piarulli (L2IT) – post CNES candidate
- Search for funds for LISA PhD student and candidate.

▼ Budget

Seuil de dépenses i
100,00 % correspond à 30181,97

% utilisation i
21,76 %

Disponible
23613,00

Origine ↑	Répartitions			Dépenses			Disponible	Aut. de dép.
	Sur exercice	Reportées	Total	Consommé	Réserve	Total		
AGDG-DEP - DR01 AGD-G Toutes dépenses	11466,14	0,00	11466,14	0,00	0,00	0,00	11466,14	✓
CNES BCU02 - FINI CNES COOPE 2018_181667***31/03/25	0,00	0,00	0,00	-90,00	0,00	-90,00	90,00	✓
CNES274216 - CNES_274216***31/03/2029	18715,83	0,00	18715,83	1124,97	5534,00	6658,97	12056,86	✓
Totaux	30181,97	0,00	30181,97	1034,97	5534,00	6568,97	23613,00	