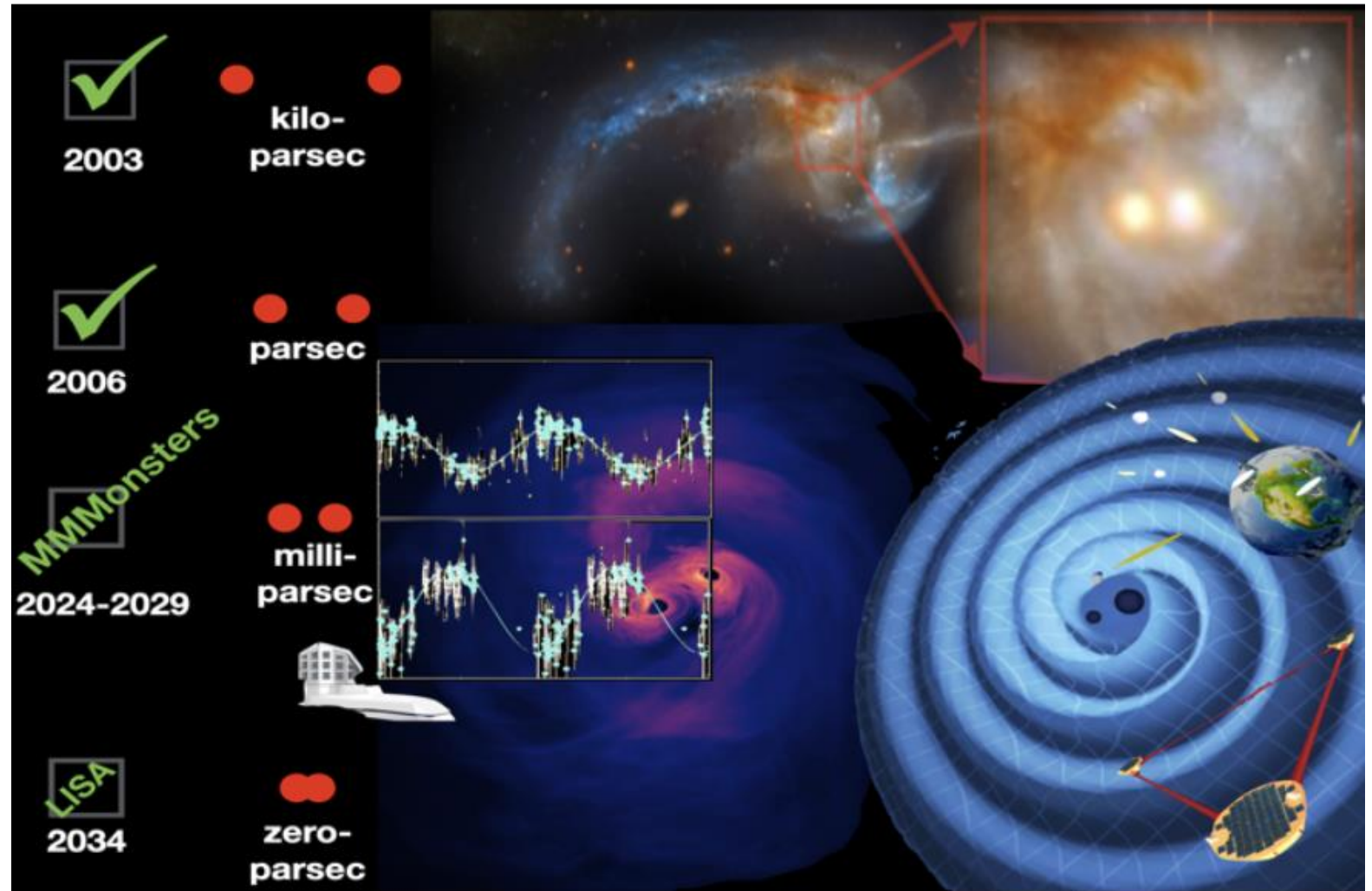

MMMonsters

ERC-StG-2023

The first multi-messenger
detection of a supermassive
black hole binary

Maria Charisi

*Institute of Astrophysics
Foundation for Research &
Technology – Hellas (FORTH)*



ACADEMIC PATH



ARISTOTLE UNIVERSITY OF THESSALONIKI

- ⊙ BSc in Physics (2011)
- ⊙ Admitted with top score among ~220 students



COLUMBIA UNIVERSITY

- ⊙ PhD in Astronomy (2017)
- ⊙ One of the first EM Searches for SMBH Binaries



CALTECH (TAPIR)

- ⊙ NANOGrav Fellowship (2017-2020)
- ⊙ Gravitational-wave Searches for SMBH Binaries



VANDERBILT UNIVERSITY

- ⊙ VIDA Fellowship (2020-present)
- ⊙ Pioneered multi-messenger studies of SMBH Binaries



WASHINGTON STATE UNIVERSITY

- ⊙ W. Band Distinguished Ass. Professor in Physics (2024)

General Advice



- Both you and the project are evaluated. Brag shamelessly.
- Build your European network.
- Writing an ERC proposal is not an onerous task. Think about your immediate goals and get excited about your projects.



Second time is the charm!

- First applied for ERC in 2022 (Year 5 after PhD).
- My goal in 2022 was to make it to the round 2*.
- *National funds if you get an A.
- The questions at the interview and the feedback from the reviewers helped me improve the proposal.
- Got it in 2023!

Seek feedback

- Ask for help with the budget from your institute.
- Get successful templates.
- Ask friends and colleagues to read your proposal (at least B1).



Start with the budget

- 1.5 million Euros (or more) goes a long way in Greece!
- What resources are necessary?
 - Data rights for telescope.
- How much personnel can you cover?
 - 11 post-doc years
 - 9 PhD years
- How much work you can do helps determine the scope of the project.

EM Search		Year 1	Year 2	Year 3	Year 4	Year 5
	Quasar Variability	Postdoc1	Postdoc1	Postdoc1		
	Non-Sinusoidal Periodicity		PhD1	PhD1	PhD1	
	Prep & Search in LSST	Postdoc2	Postdoc2	Postdoc2	Postdoc2	Postdoc2
Multi-messenger	Galaxy Catalog	PhD2	PhD2	PhD2		
	Improved GW Search		Postdoc3	Postdoc3	Postdoc3	
	Joint (EM+GW) Search			PhD3	PhD3	PhD3

Start Early ... or NOT

- Common advice: “Start 6 months before the deadline!”
- Advice I live by: “If you start early, you will waste time.”
- My timeline:
 - 1st time: 6 weeks before the deadline.
 - 2nd time: 10 days before the deadline.



During our deliberations we recognized that some terms that had previously been in use may not be fit for purpose. The term 'high-risk, high-gain' was seen as potentially confusing and problematic. This concept is often invoked to discourage evaluation panels from conservatism in their choice of what to fund. Indeed, the possibility that a project will not fulfil its aims is inherent in frontier research, but this possibility means precisely that the results cannot be predicted. On the other hand, a researcher who, for example, has already established with preliminary data that an exciting new approach is likely to work, may be able to carry out ground-breaking work with a relatively high chance of success.

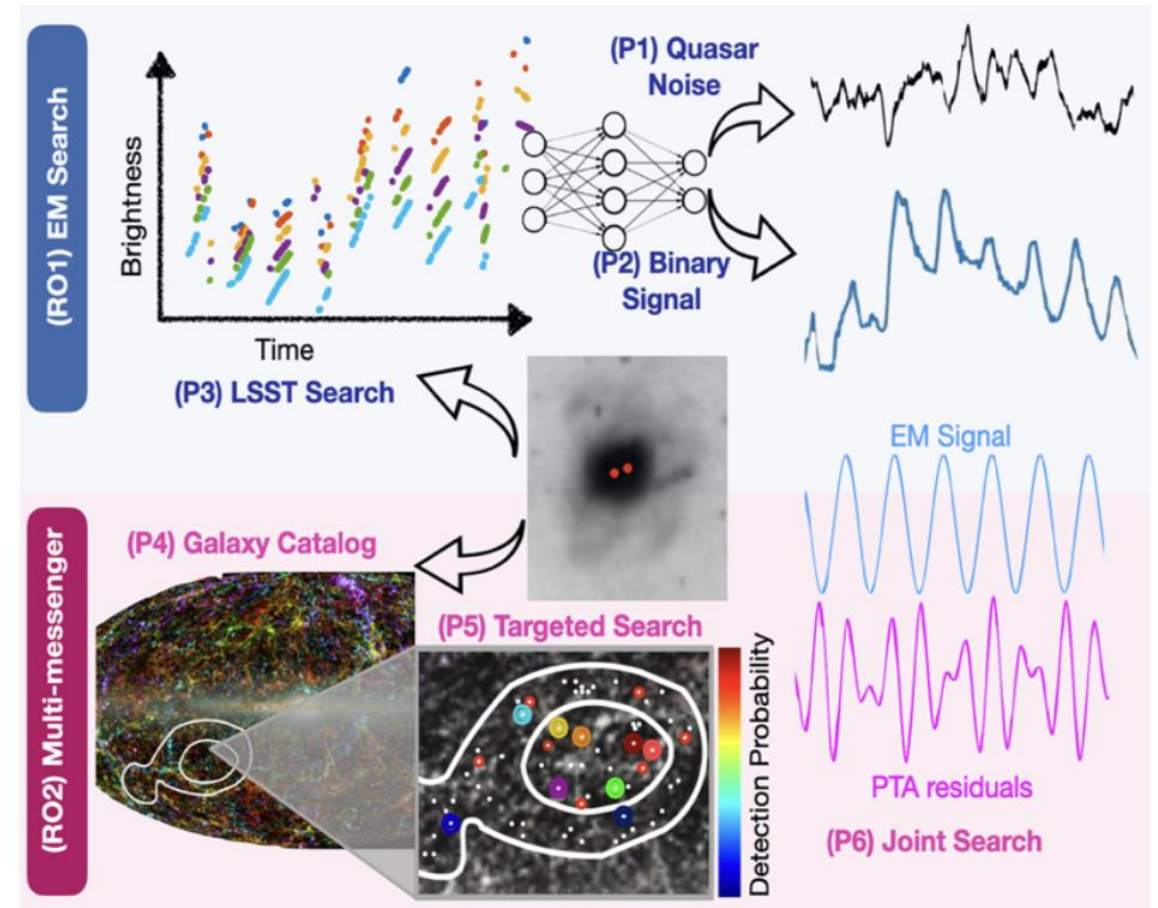
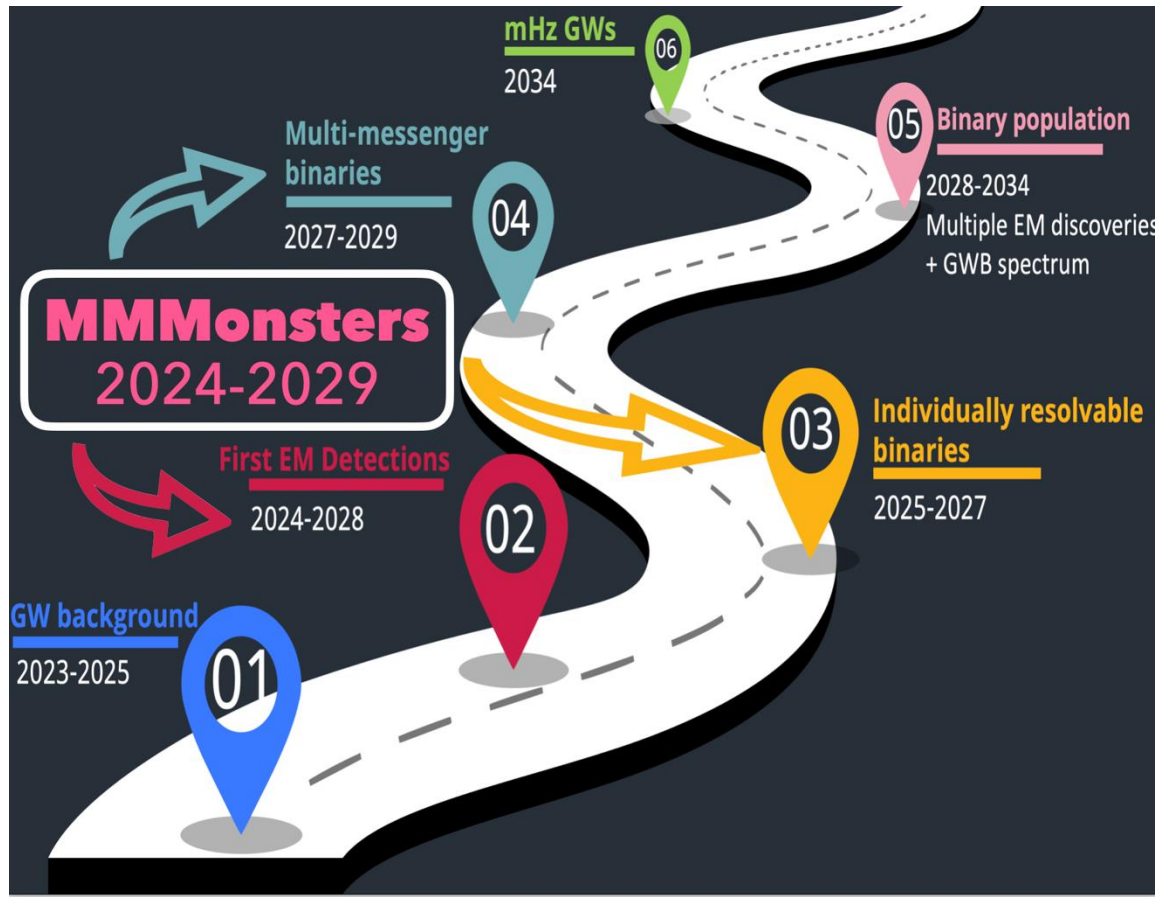
We stress that the ERC continues to look for proposals that address important challenges and hope that the research funded by the ERC will lead to major advances at the frontier of knowledge. However, the 'high-risk, high-gain' conjunction is not helpful for the evaluation of proposals, and the terms 'ambitious', 'creative and original' are better descriptors for the kinds of proposals the ERC should fund.

An element that can be positive but is not strictly necessary for an excellent proposal is the 'development of novel methodologies'. New methodologies can allow long-standing problems or questions to be tackled and developing them is therefore crucial for advancing knowledge. However, an applicant may come up with an original idea for approaching an unsolved problem with an existing methodology. Conversely, new methodologies could be developed and then employed for projects of minor importance or interest. Thus, the development of new methodologies is neither necessary nor sufficient to make a proposal excellent. It therefore does not make sense to ask evaluators specifically about this in the

High Risk – High Gain

- Sounds daunting!
- Means research at the frontier of your field!

A picture is worth a thousand words





**KEEP
CALM
AND
ACE THE
INTERVIEW**

The interview

- Practice! Practice! Practice!
- You are THE expert in your proposed science.
- Easy to anticipate what could be seen as a weakness. Prepare accordingly.
- Know your budget and justification.
- Know your competition (Why you? Who else can do it?)