

# Overview

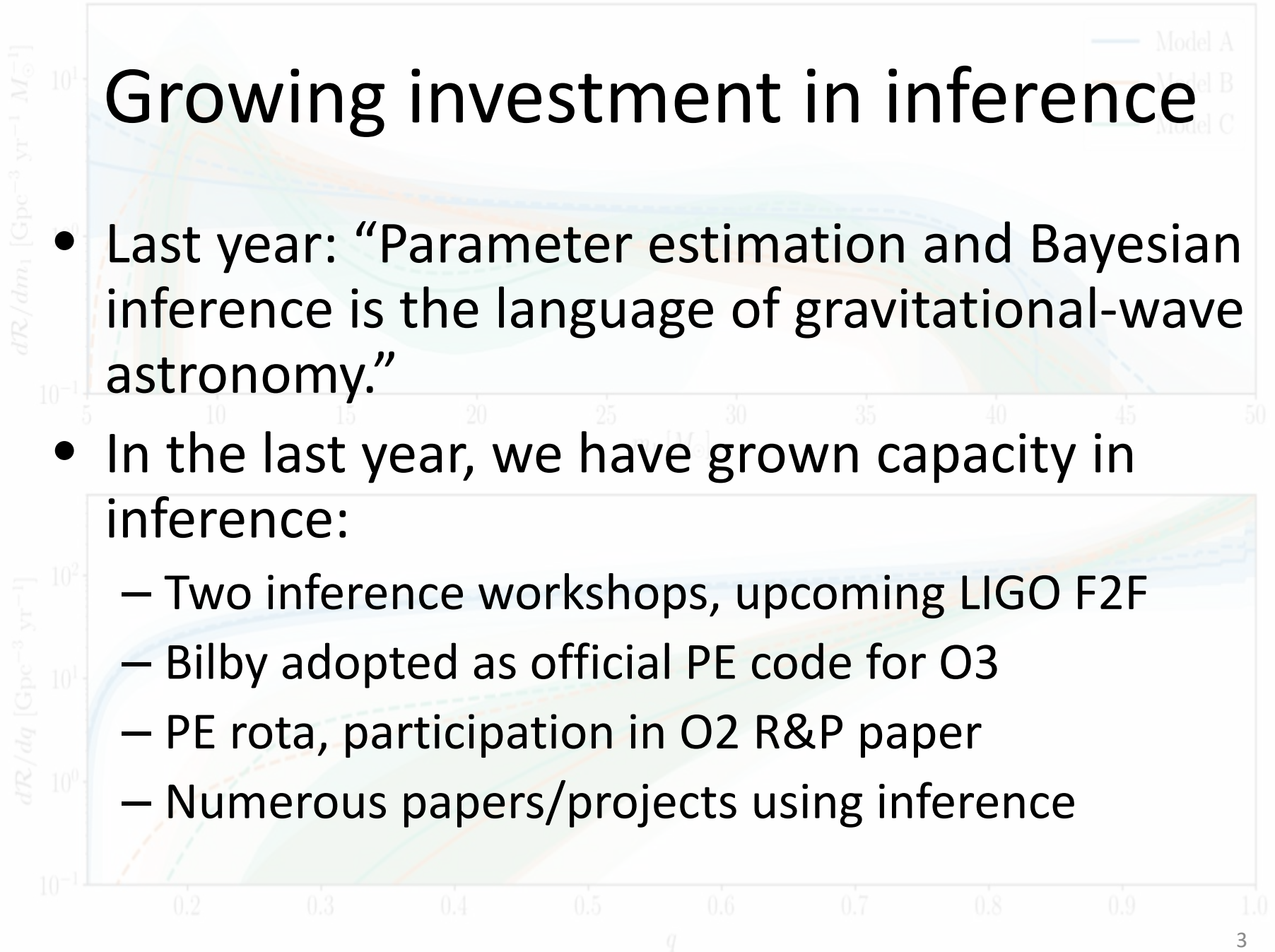
- I aim for this talk to be a bit provocative.
- I list some of the areas in which I see great potential for growth.
- I suggest some goals we can consider adopting in order to capitalise on emerging opportunities.



# Growing investment in inference

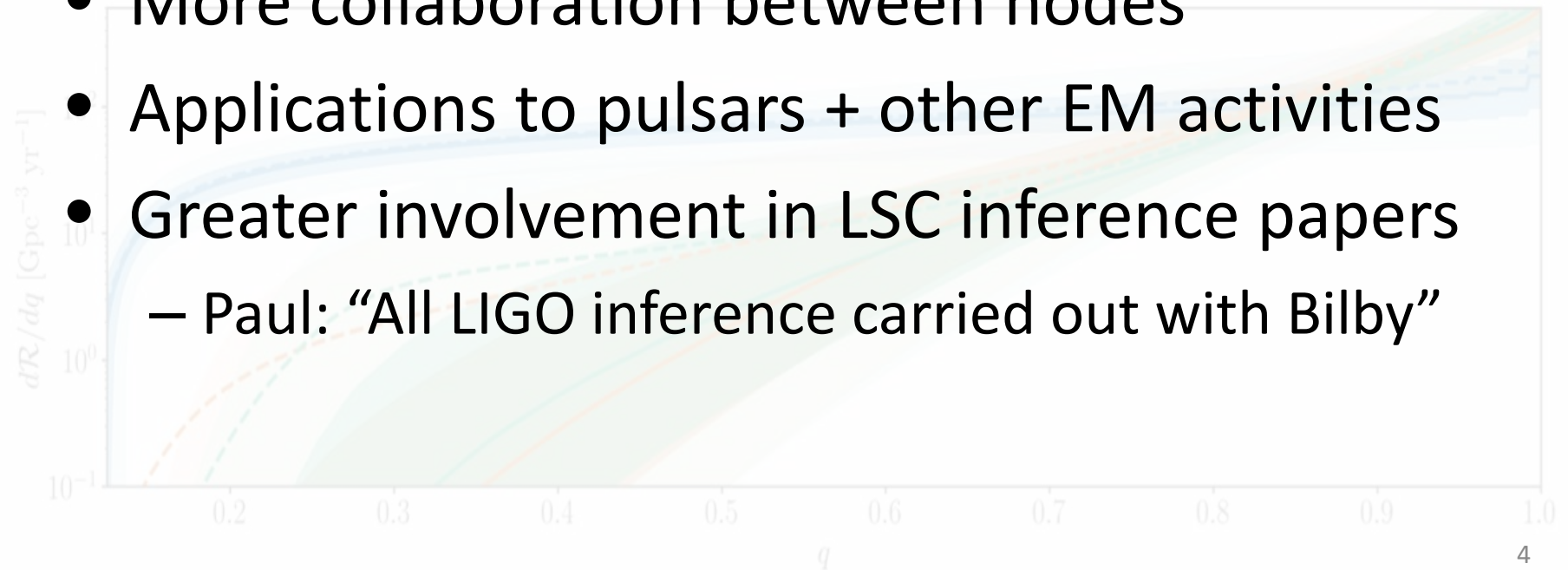
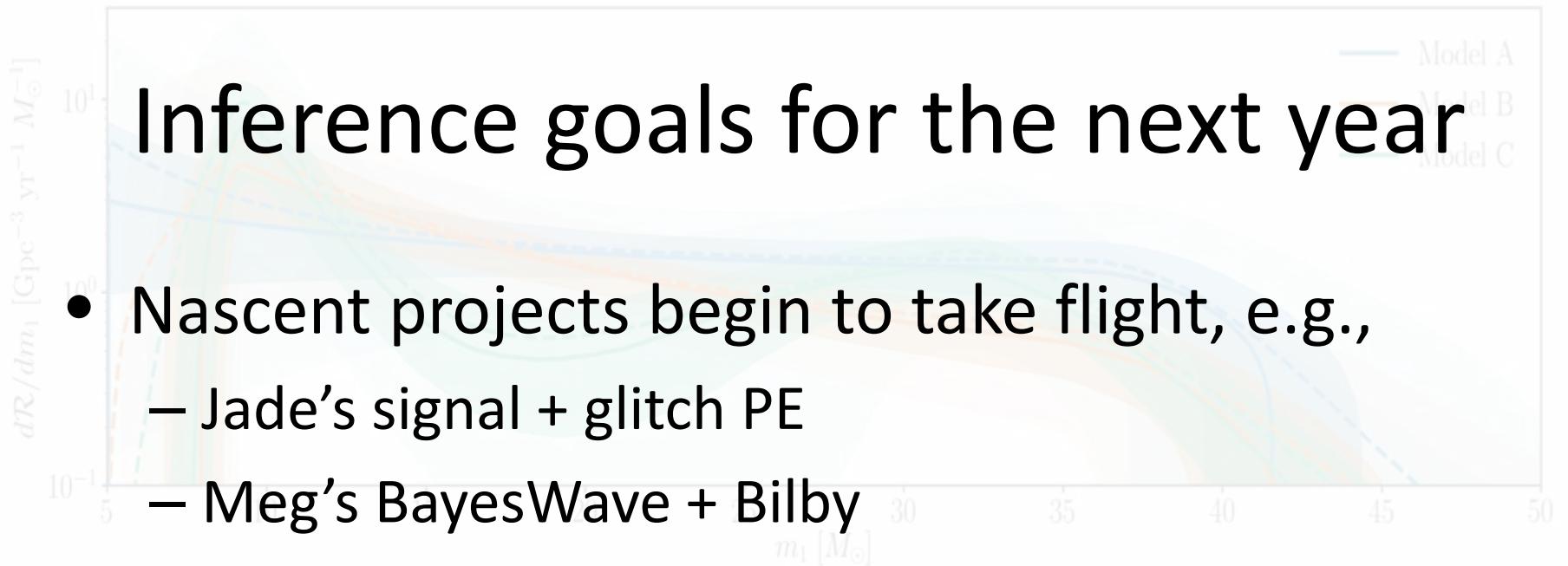
- Last year: “Parameter estimation and Bayesian inference is the language of gravitational-wave astronomy.”
- In the last year, we have grown capacity in inference:

- Two inference workshops, upcoming LIGO F2F
- Bilby adopted as official PE code for O3
- PE rota, participation in O2 R&P paper
- Numerous papers/projects using inference



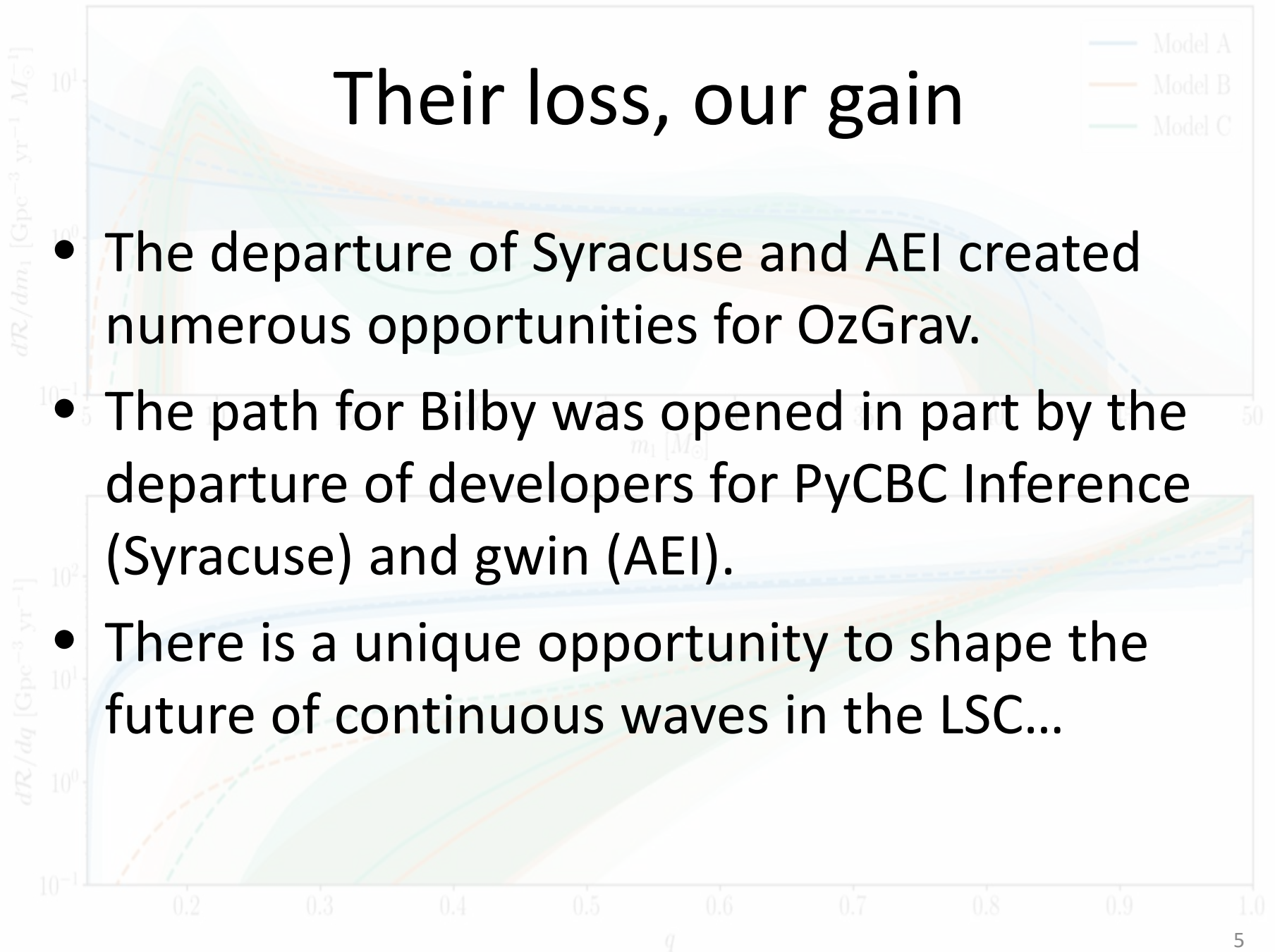
# Inference goals for the next year

- Nascent projects begin to take flight, e.g.,
  - Jade’s signal + glitch PE
  - Meg’s BayesWave + Bilby
- More collaboration between nodes
- Applications to pulsars + other EM activities
- Greater involvement in LSC inference papers
  - Paul: “All LIGO inference carried out with Bilby”



# Their loss, our gain

- The departure of Syracuse and AEI created numerous opportunities for OzGrav.
- The path for Bilby was opened in part by the departure of developers for PyCBC Inference (Syracuse) and gwin (AEI).
- There is a unique opportunity to shape the future of continuous waves in the LSC...



# Karl's CW goals for next year

- I think it's fair to say that the group is facing a paradigm shift (although I'm not sure everyone has realised it yet).

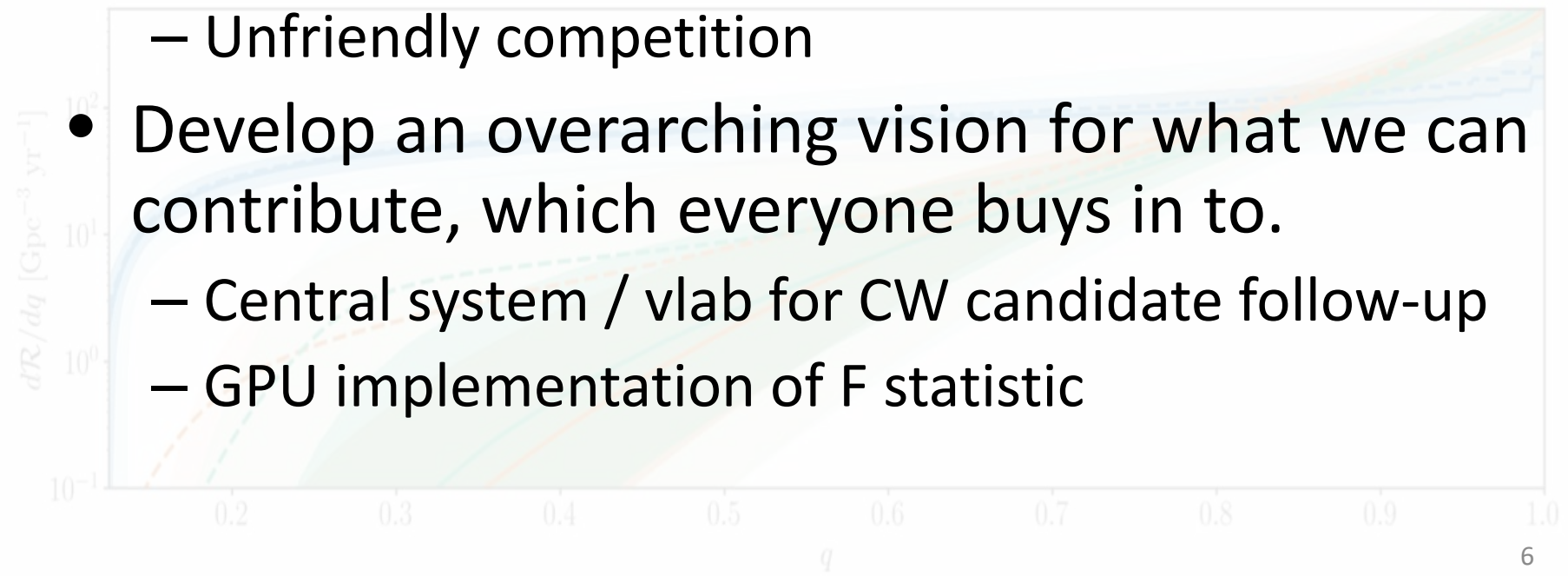
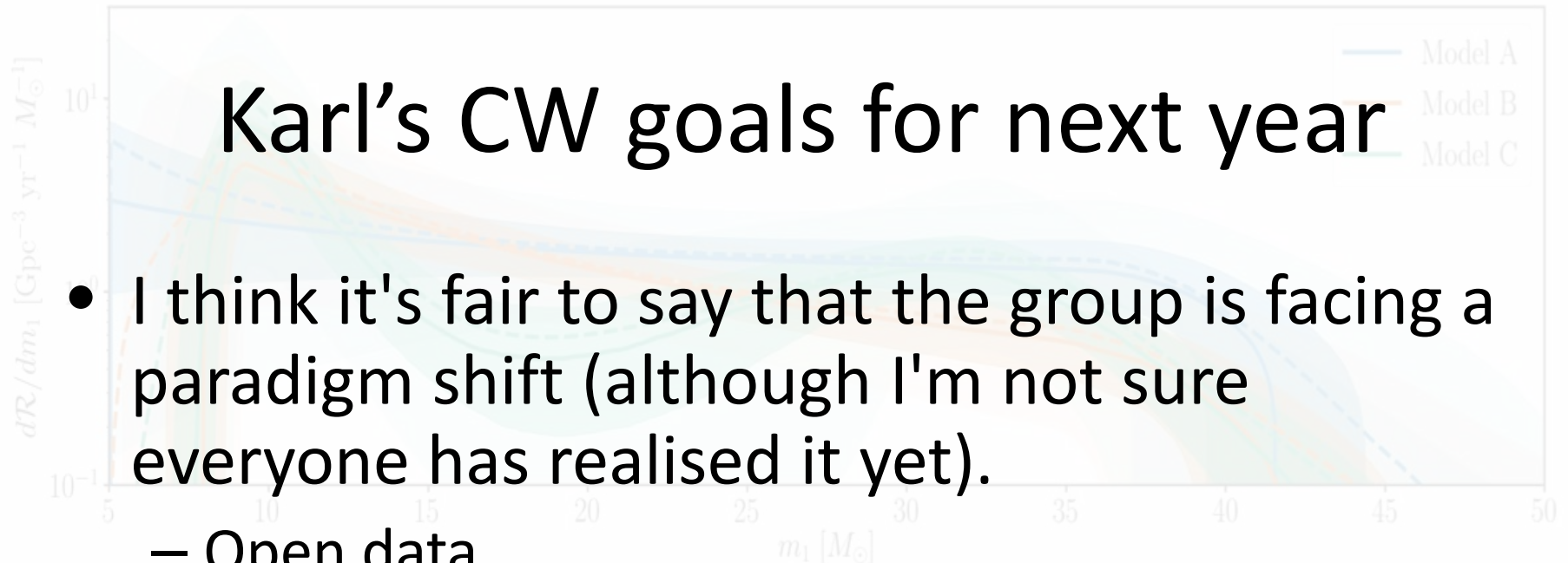
- Open data

- Unfriendly competition

- Develop an overarching vision for what we can contribute, which everyone buys in to.

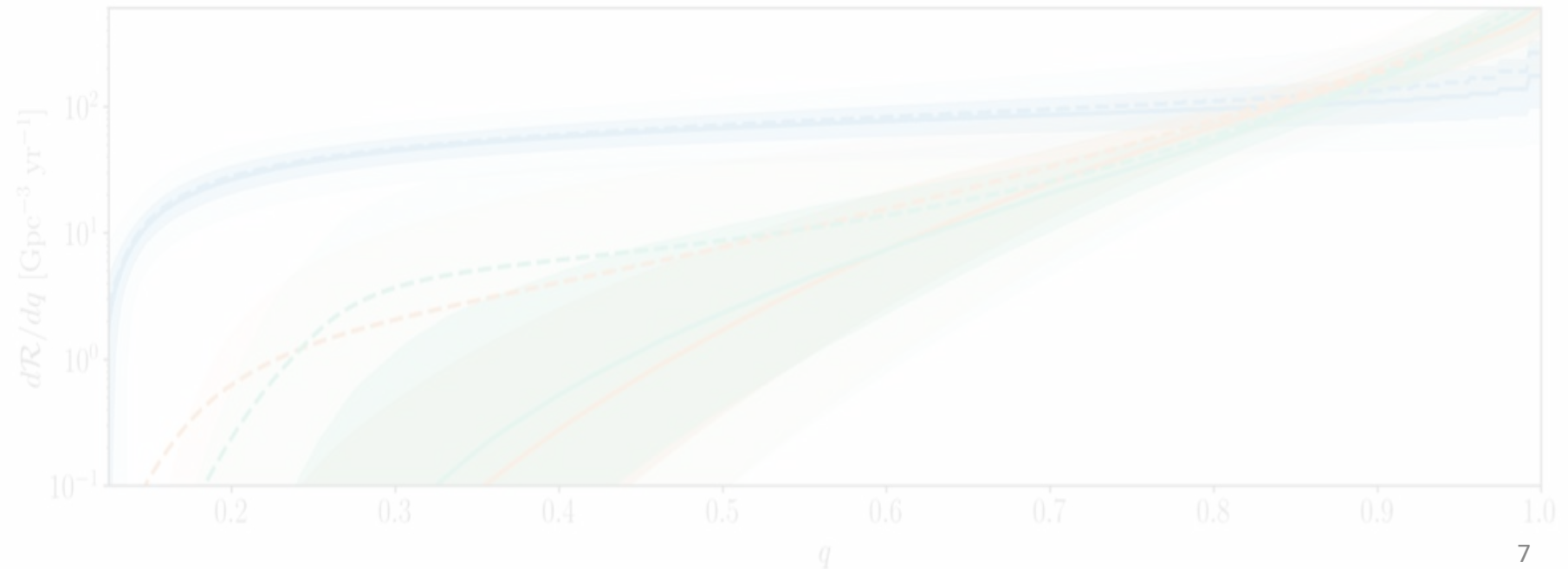
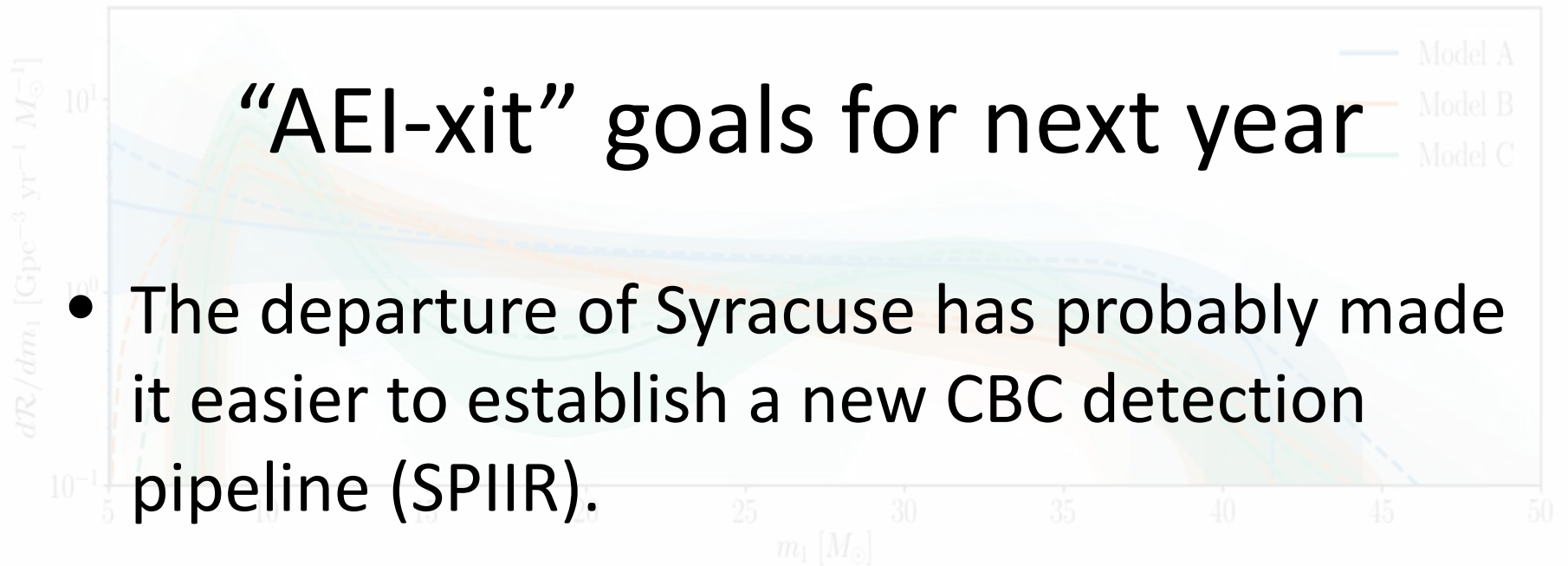
- Central system / vlab for CW candidate follow-up

- GPU implementation of F statistic



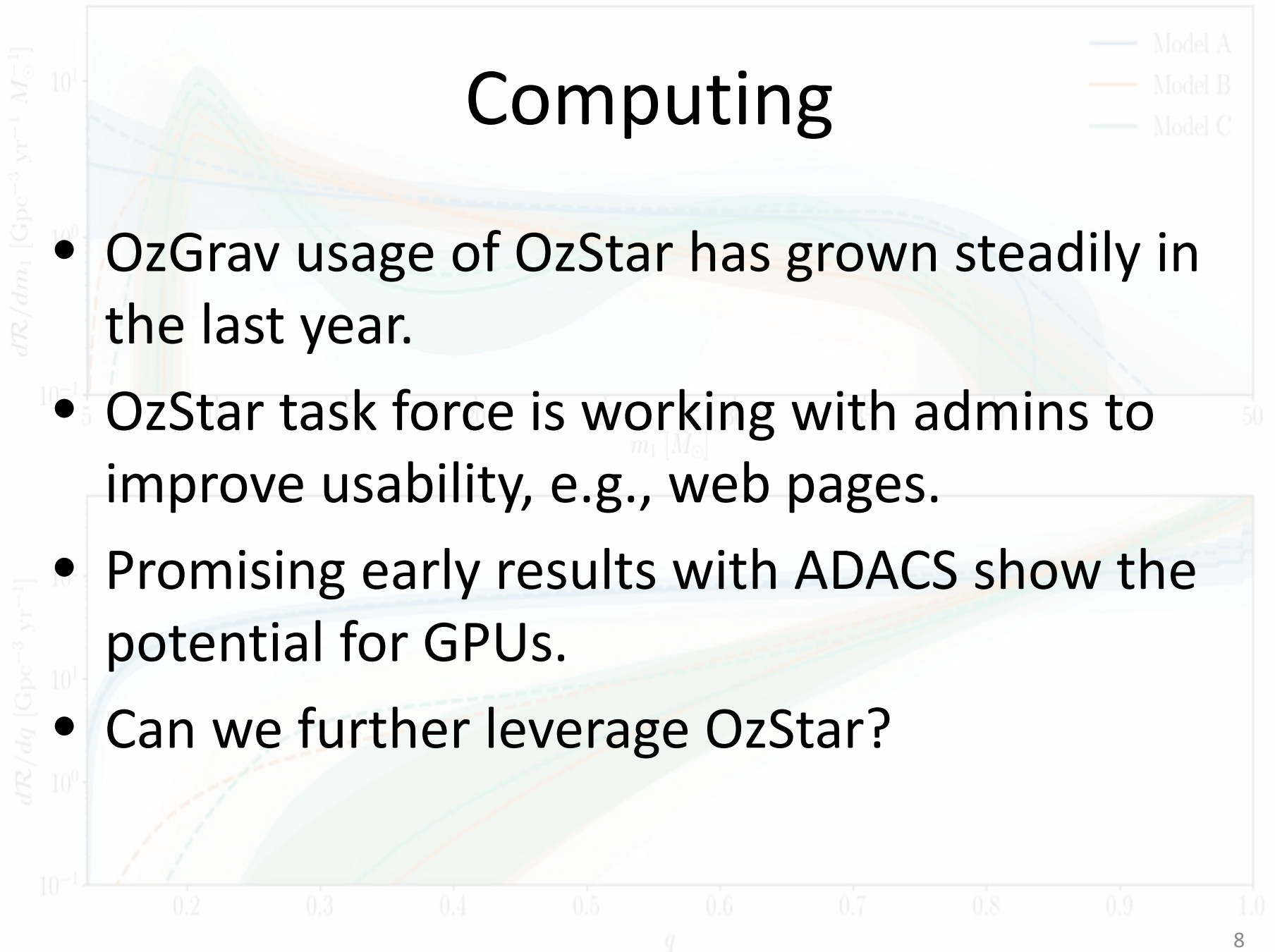
# “AEI-xit” goals for next year

- The departure of Syracuse has probably made it easier to establish a new CBC detection pipeline (SPIIR).



# Computing

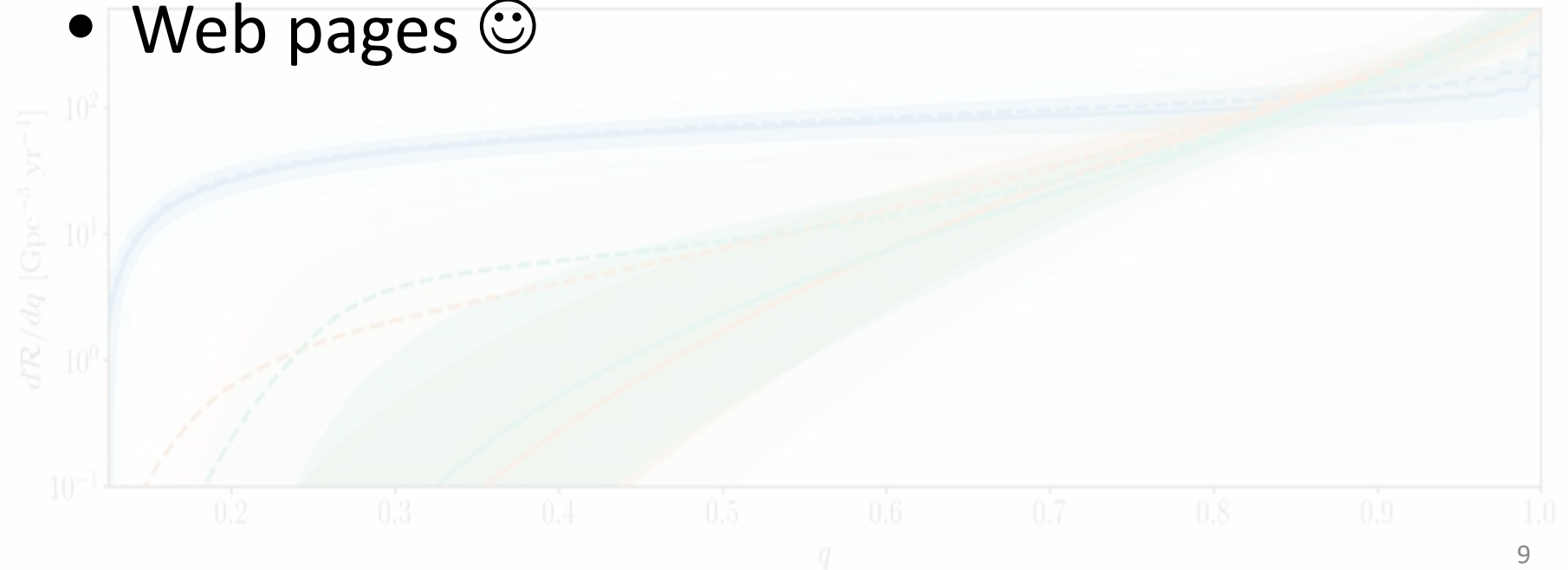
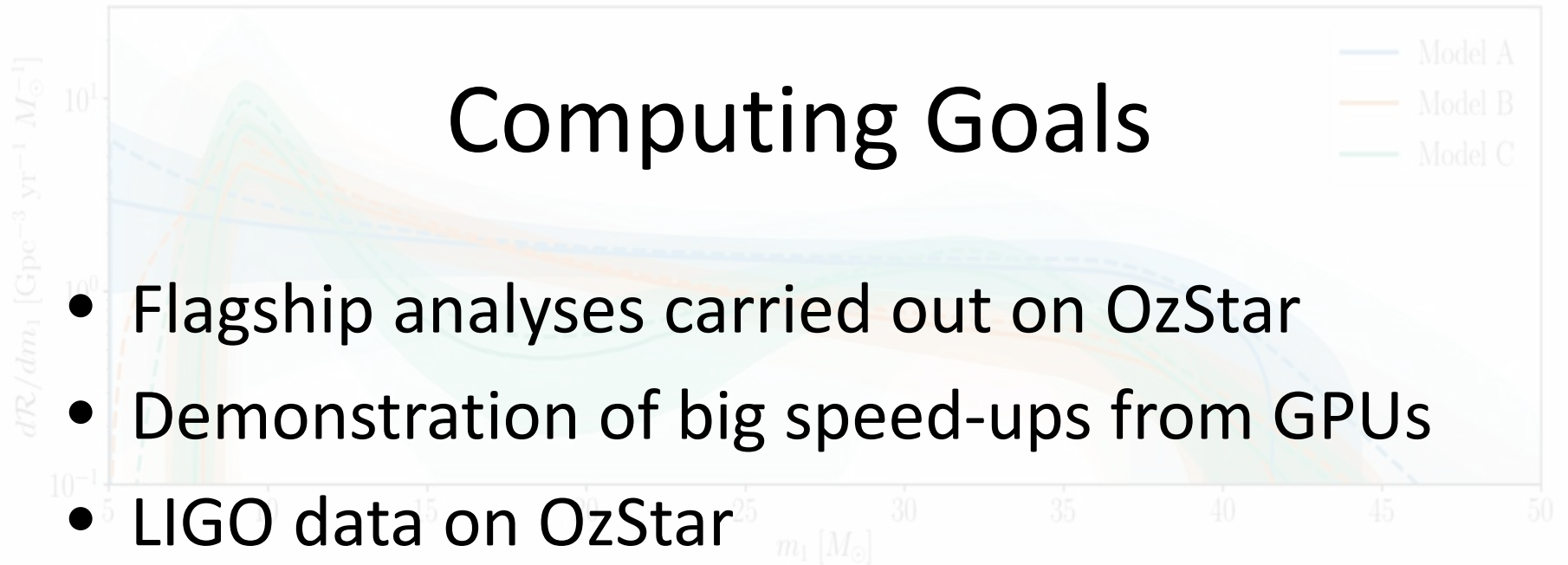
- OzGrav usage of OzStar has grown steadily in the last year.
- OzStar task force is working with admins to improve usability, e.g., web pages.
- Promising early results with ADACS show the potential for GPUs.
- Can we further leverage OzStar?





# Computing Goals

- Flagship analyses carried out on OzStar
- Demonstration of big speed-ups from GPUs
- LIGO data on OzStar
- Web pages 😊



# DetChar, collaboration with instrumentalists

- The creation of the LIGO HF working group has been an exciting development.
- Possibility of leveraging our rare combination of instrumental + astrophysics expertise.
- If we can produce a compelling vision that reflects the Australian consensus, this could boost GW science in Australia for years to come...



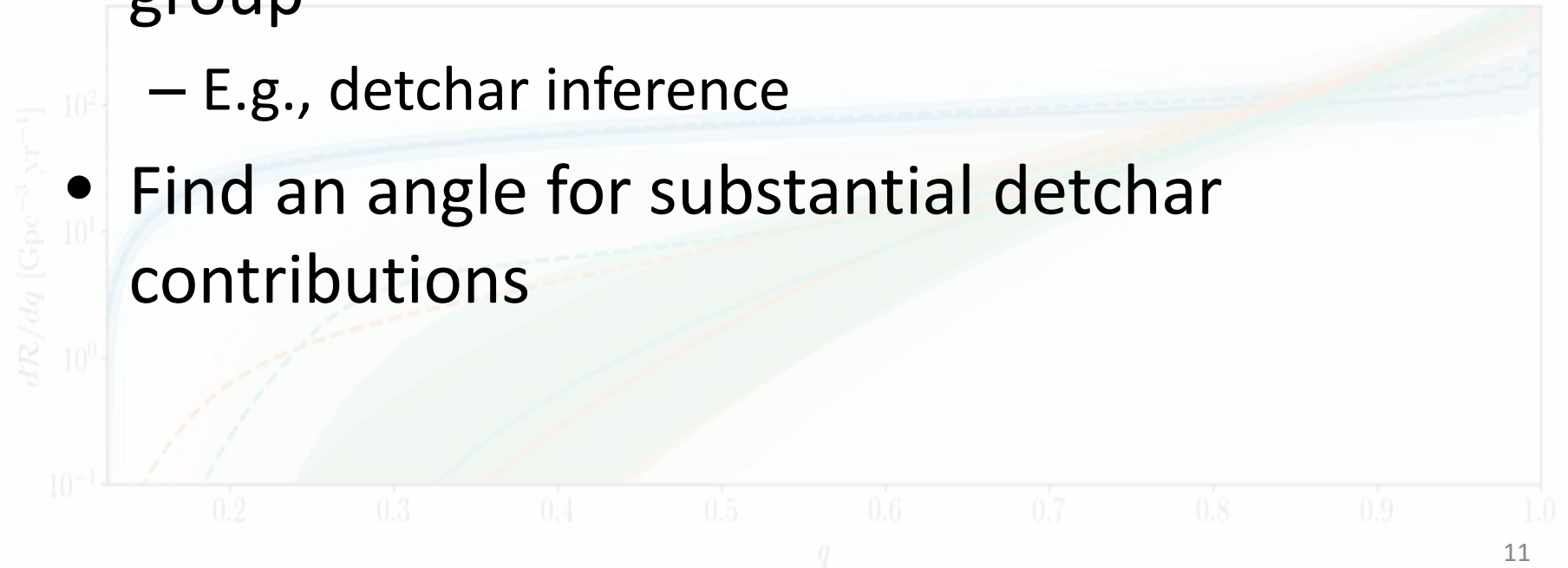
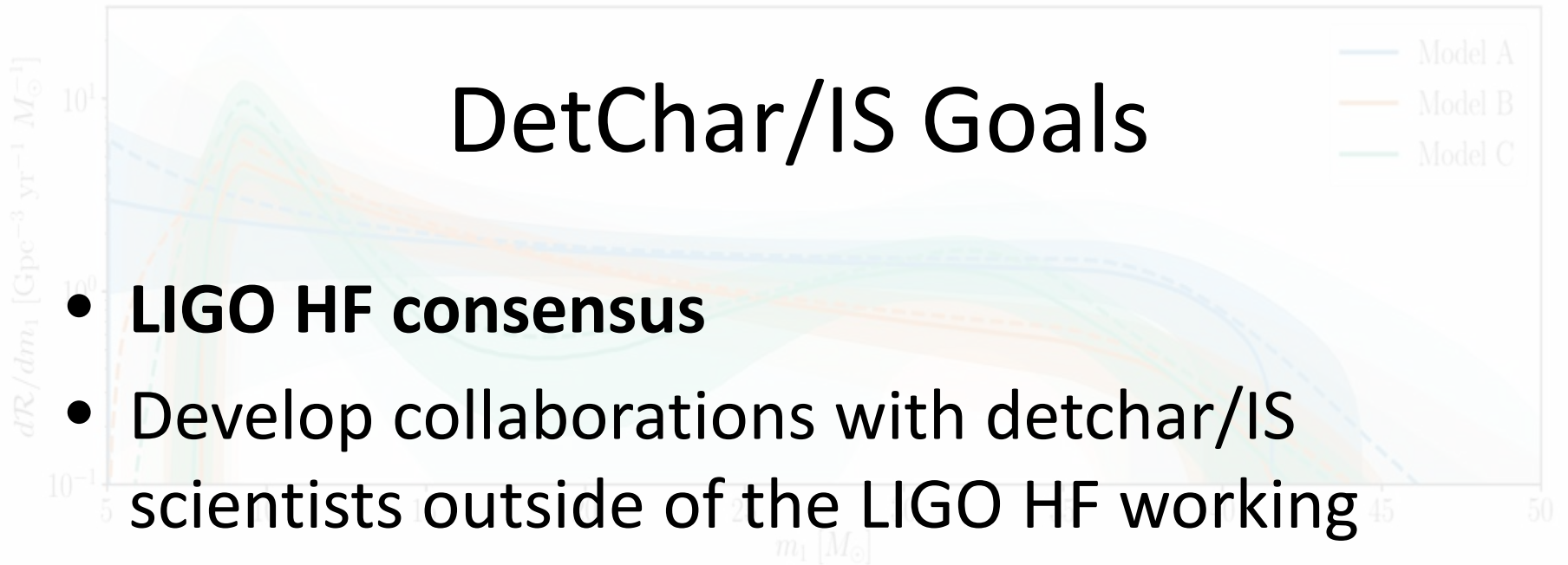
# DetChar/IS Goals

- **LIGO HF consensus**

- Develop collaborations with detchar/IS scientists outside of the LIGO HF working group

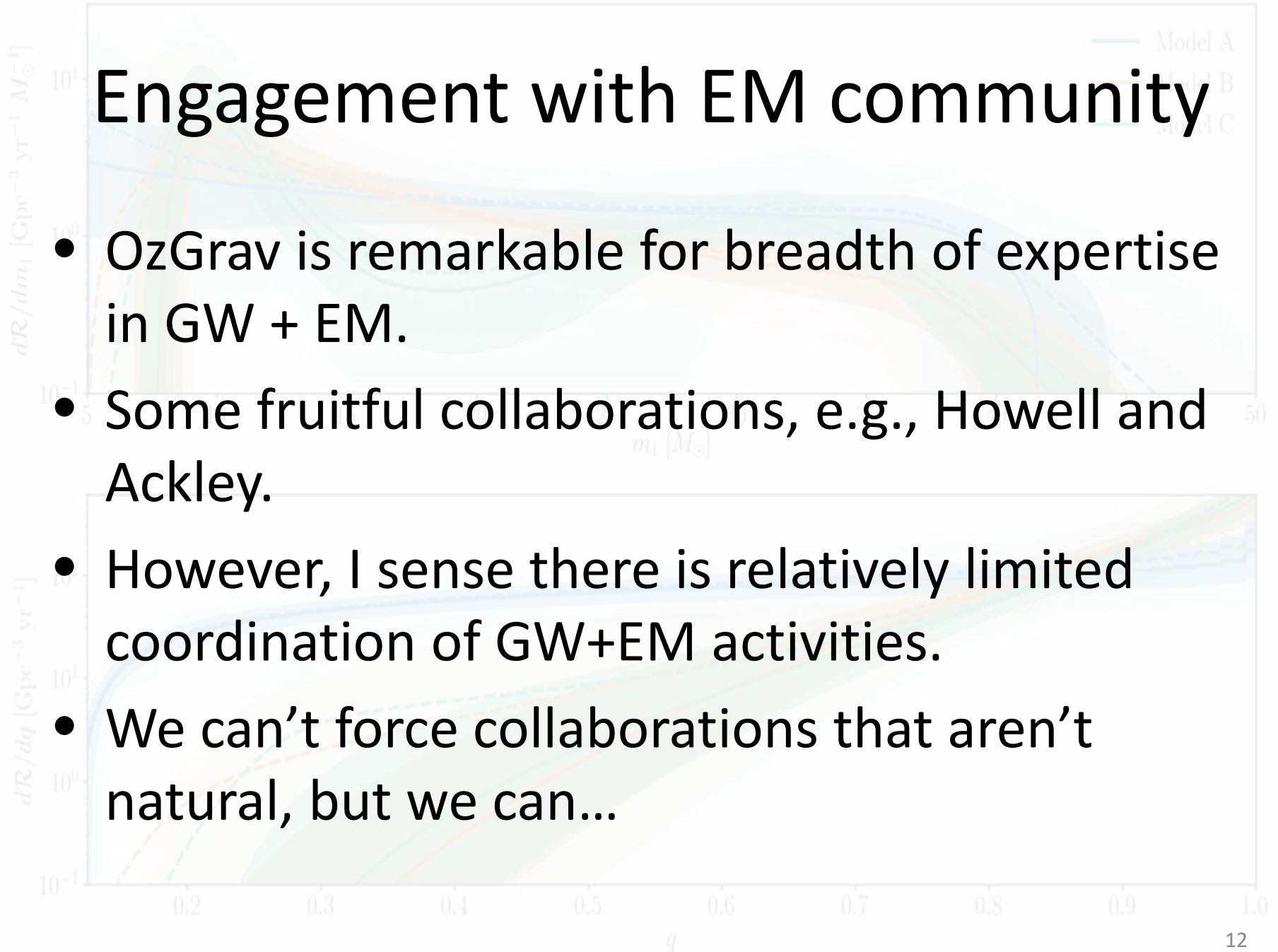
– E.g., detchar inference

- Find an angle for substantial detchar contributions



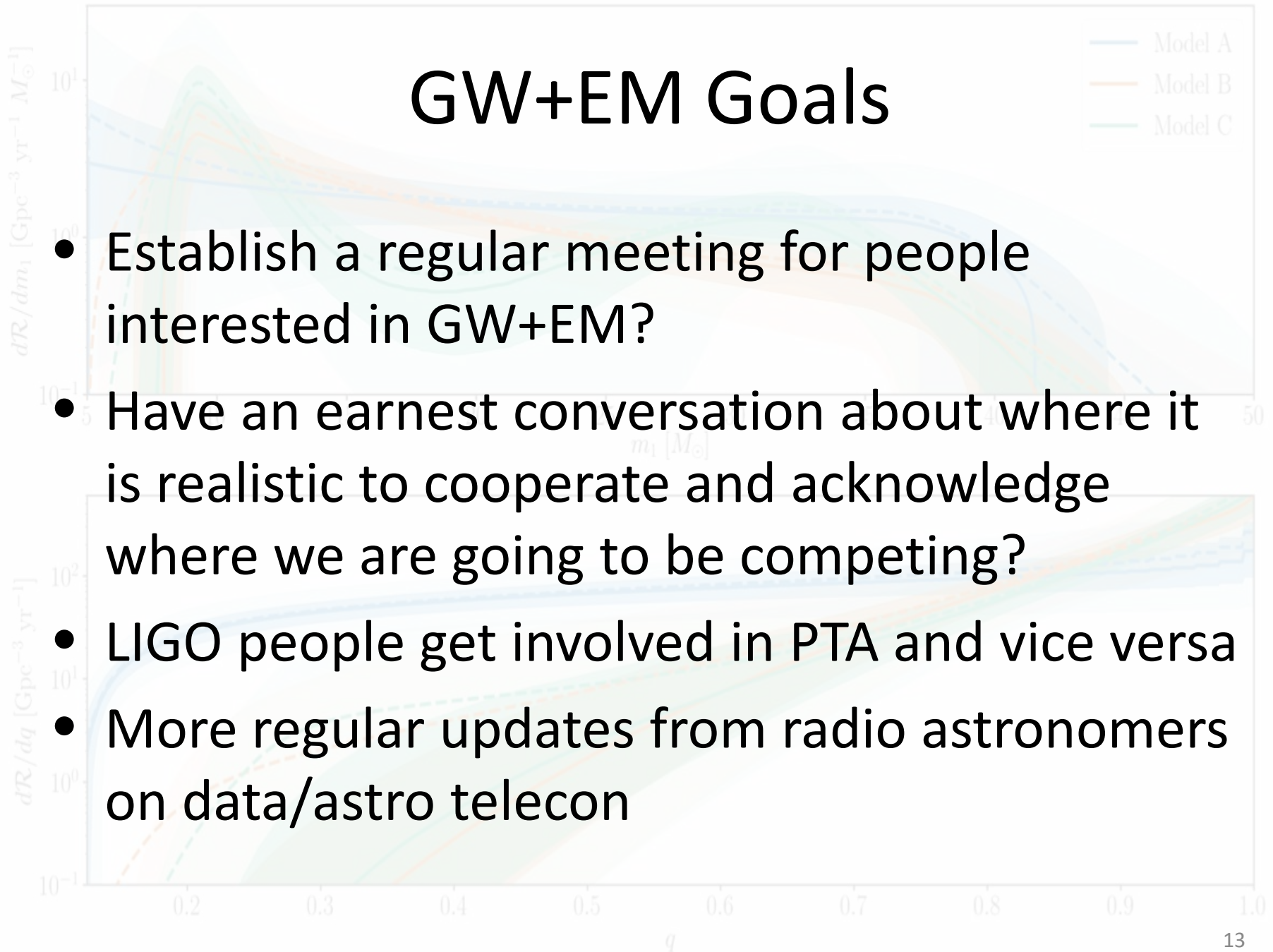
# Engagement with EM community

- OzGrav is remarkable for breadth of expertise in GW + EM.
- Some fruitful collaborations, e.g., Howell and Ackley.
- However, I sense there is relatively limited coordination of GW+EM activities.
- We can't force collaborations that aren't natural, but we can...



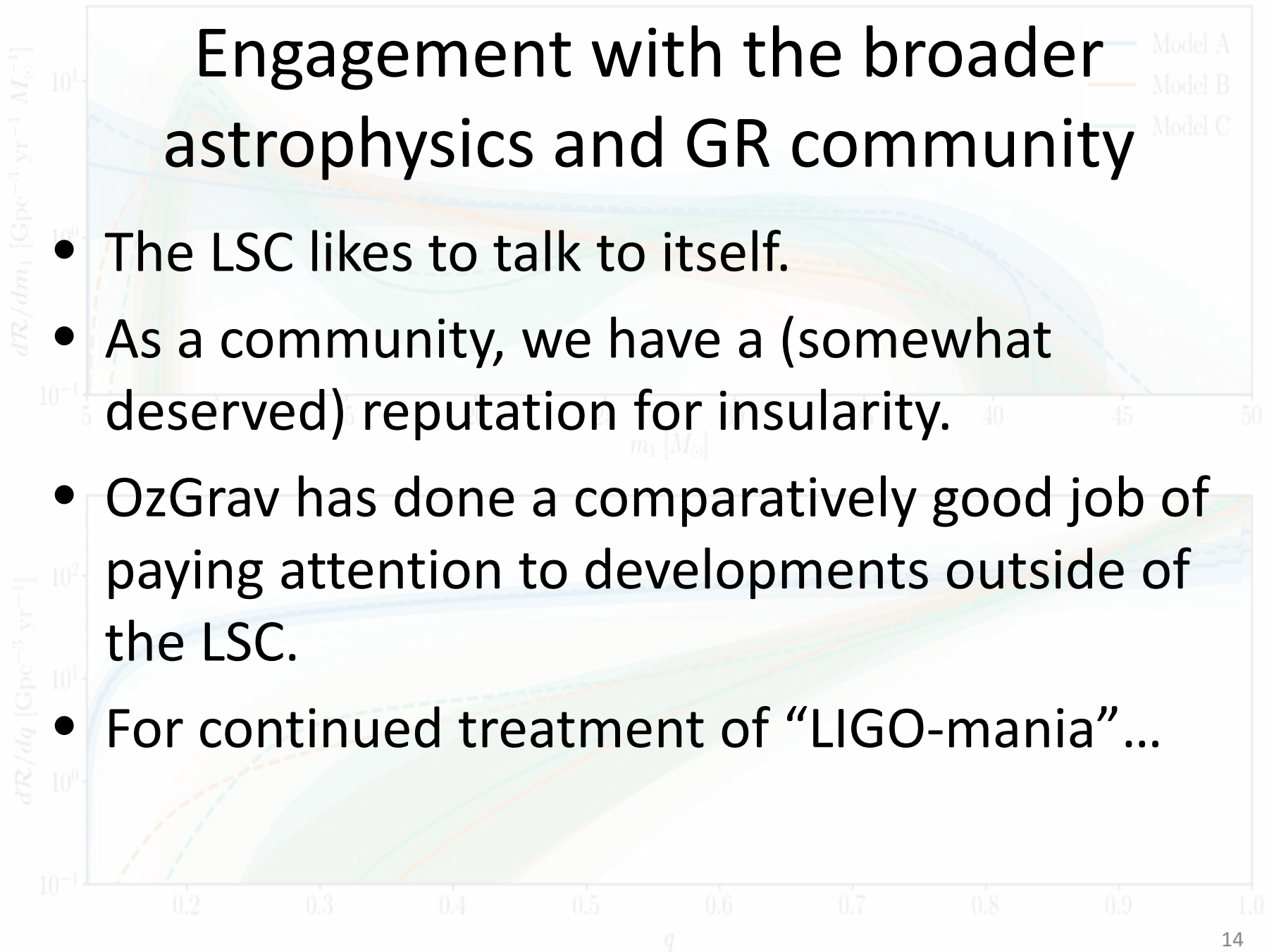
# GW+EM Goals

- Establish a regular meeting for people interested in GW+EM?
- Have an earnest conversation about where it is realistic to cooperate and acknowledge where we are going to be competing?
- LIGO people get involved in PTA and vice versa
- More regular updates from radio astronomers on data/astro telecon



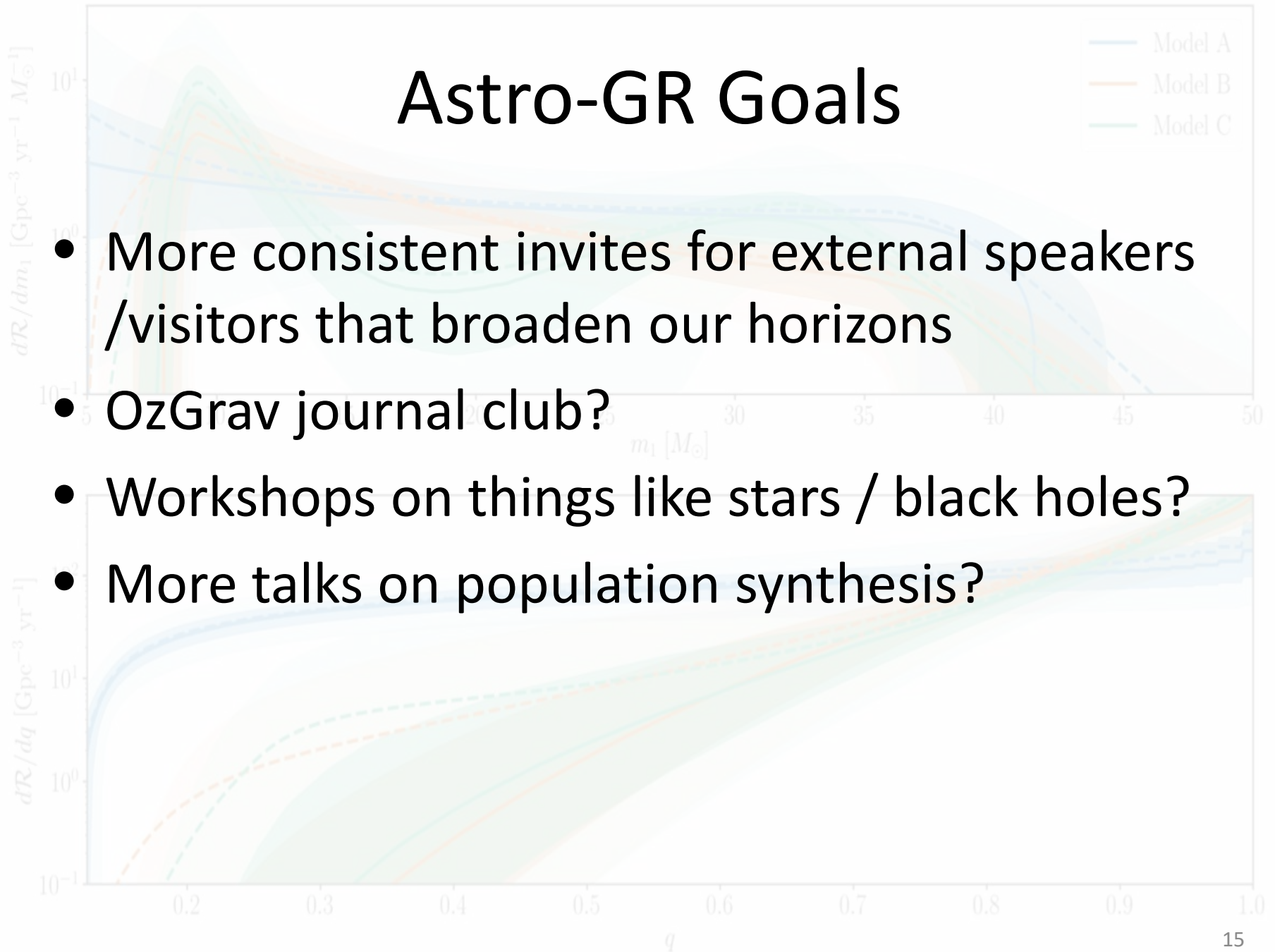
# Engagement with the broader astrophysics and GR community

- The LSC likes to talk to itself.
- As a community, we have a (somewhat deserved) reputation for insularity.
- OzGrav has done a comparatively good job of paying attention to developments outside of the LSC.
- For continued treatment of “LIGO-mania” ...



# Astro-GR Goals

- More consistent invites for external speakers /visitors that broaden our horizons
- OzGrav journal club?
- Workshops on things like stars / black holes?
- More talks on population synthesis?



# The End

- What is your vision for the next year?

