



The ngVLA Science Case

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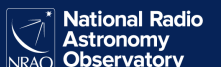
6/5/2023, AAS Albuquerque



National Radio
Astronomy
Observatory

Overview

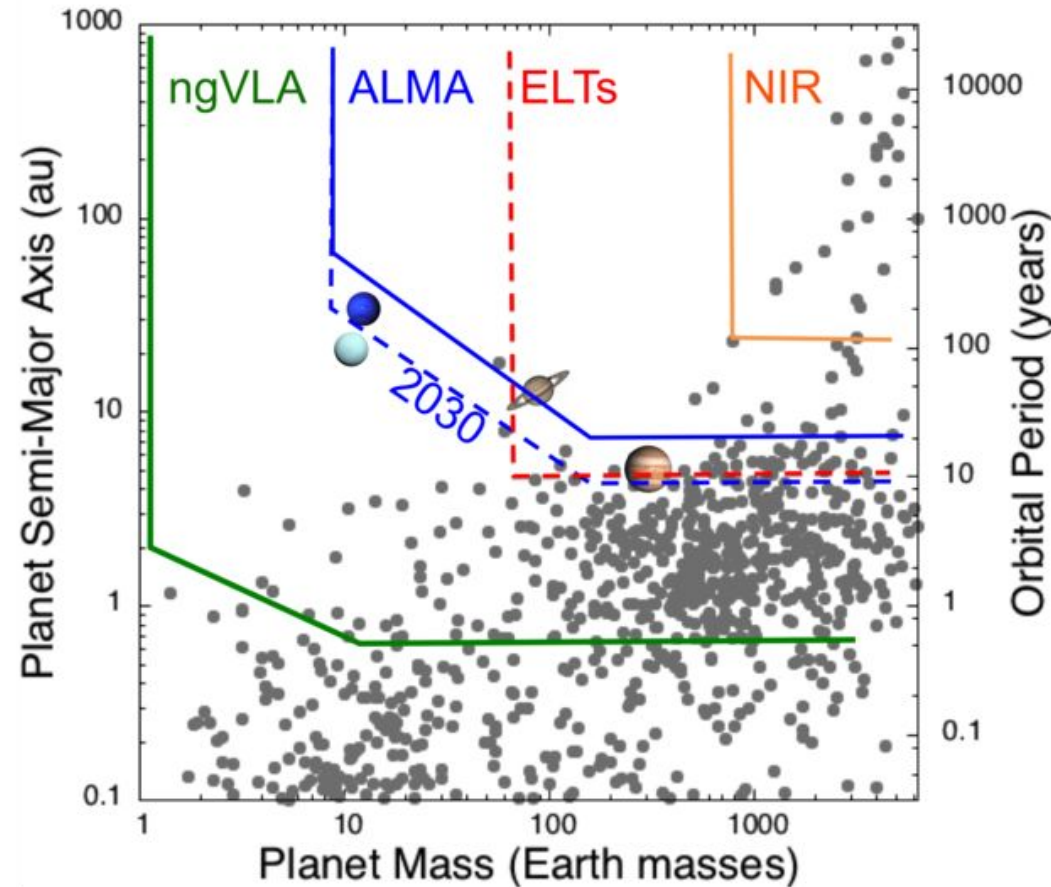
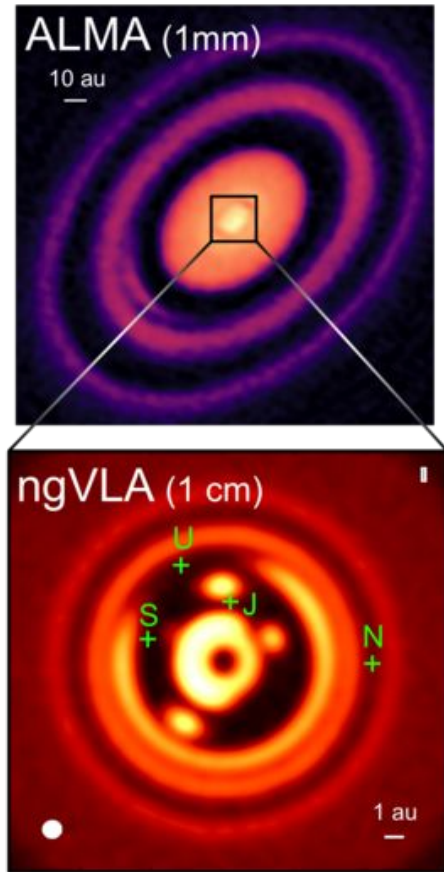
- ngVLA Key Science Goals
- Science Working Group Structure
- Some feedback from the New Eyes on the Universe Meeting



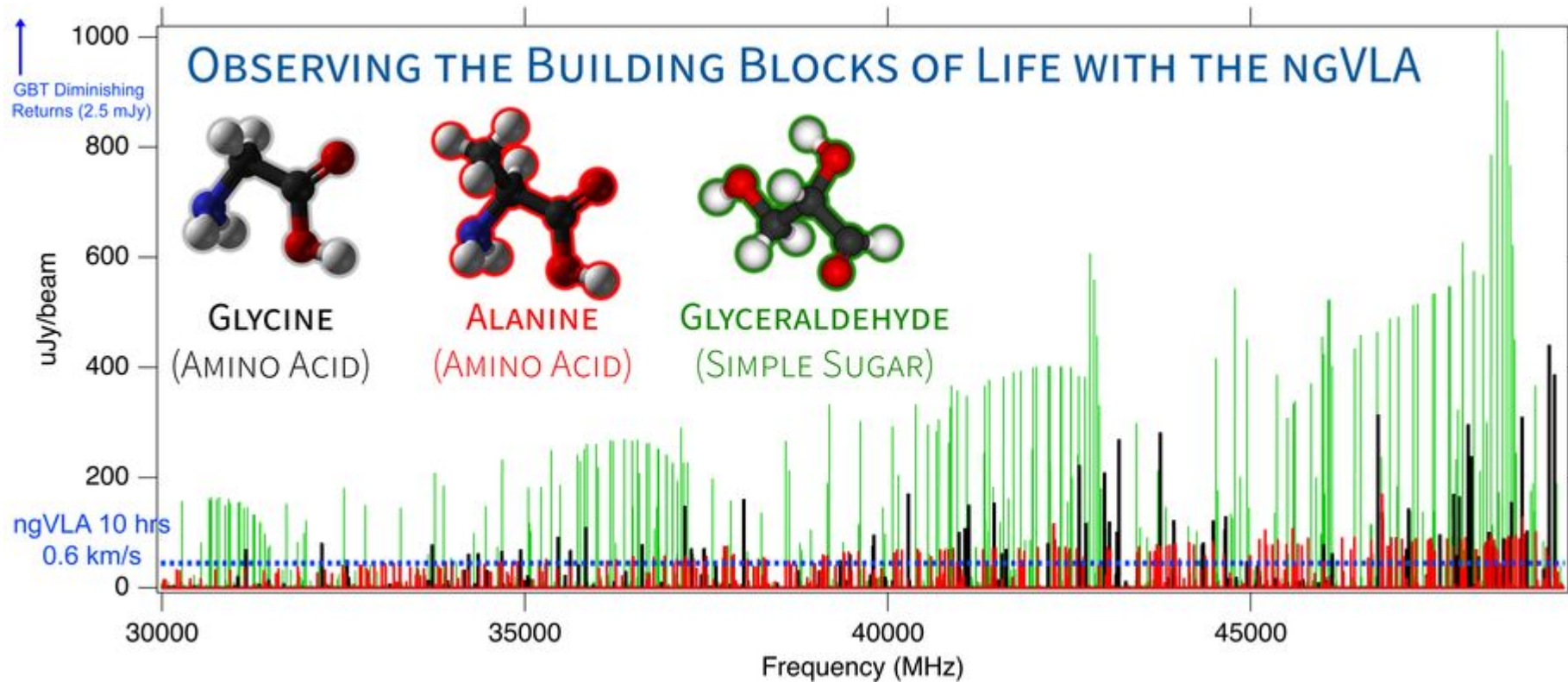
Key Science goals versus Science Working Groups

- Key Science Goals are a few projects that drive the technical requirements for the ngVLA
- Science Working Groups mostly map to the KSGs, but cover a much broader range of phenomena that help motivate ngVLA
- KSGs are already largely set in stone, but many more use cases can be proposed via the SWGs
 - There is still plenty of time to get involved if you have new ideas (or old ideas that haven't been written up)!

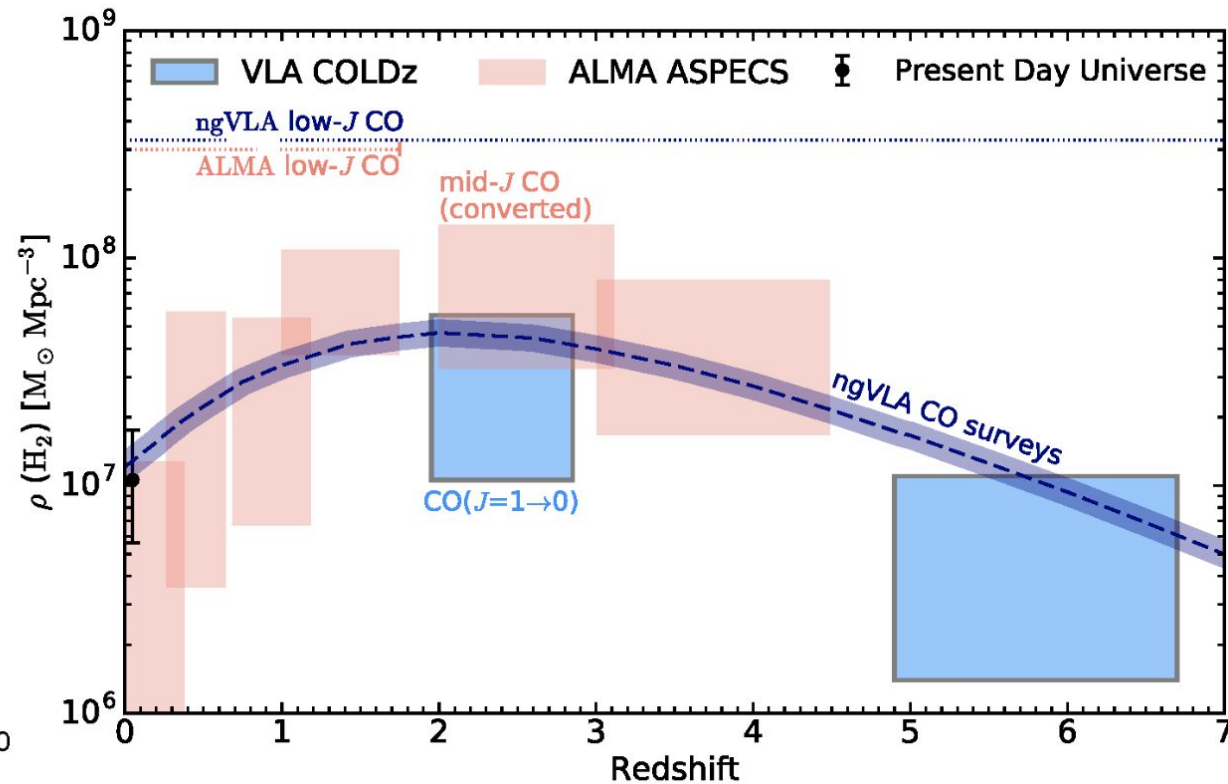
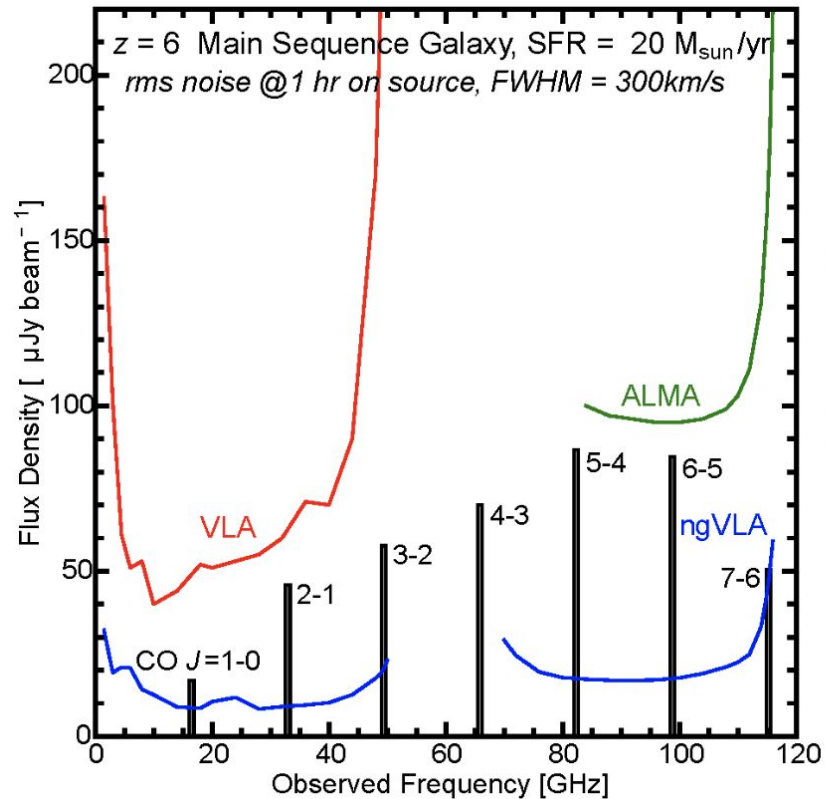
KSG 1: Unveiling the Formation of Solar System Analogs on Terrestrial Scales



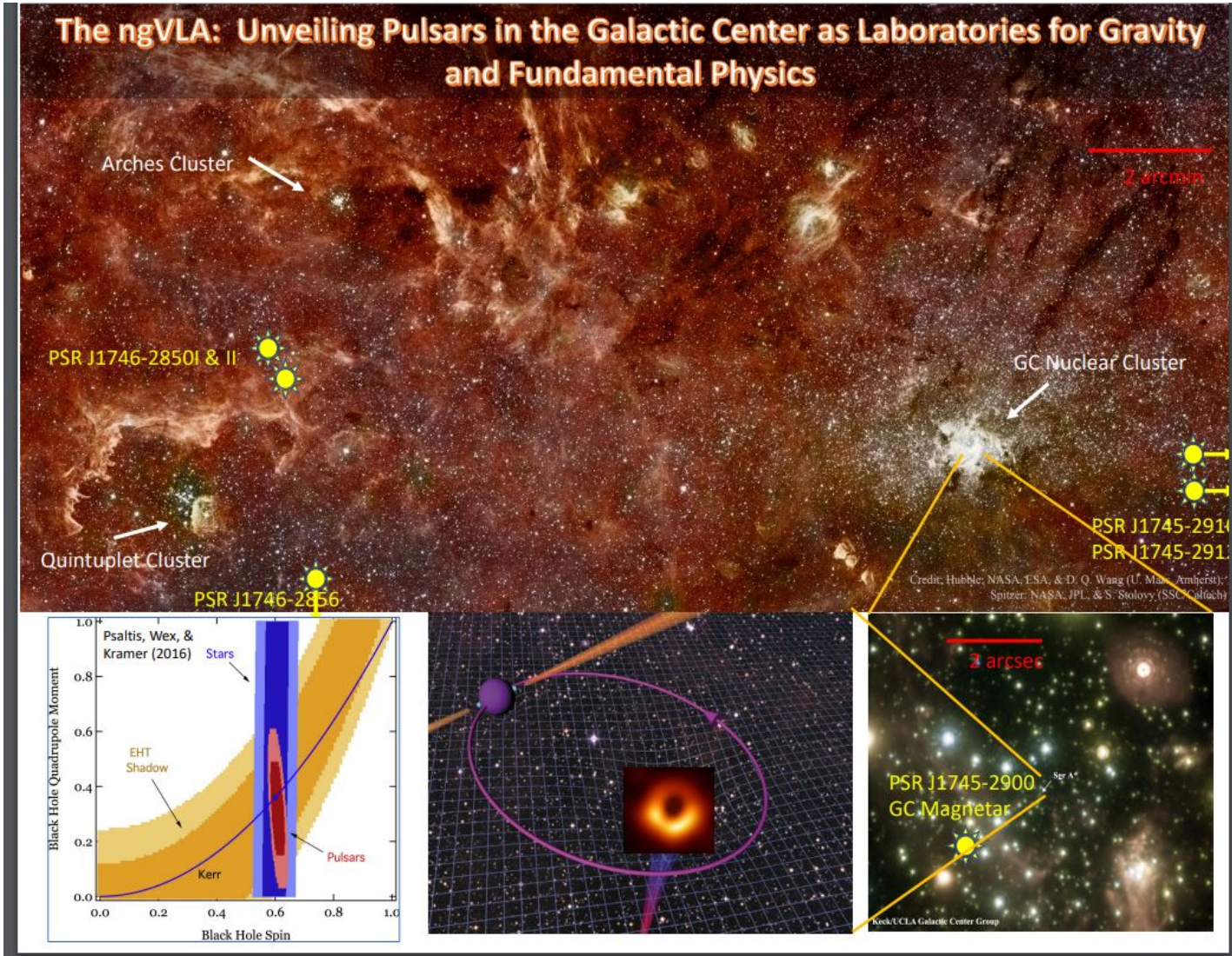
KSG 2: Probing the Initial Conditions for Planetary Systems and Life with Astrochemistry



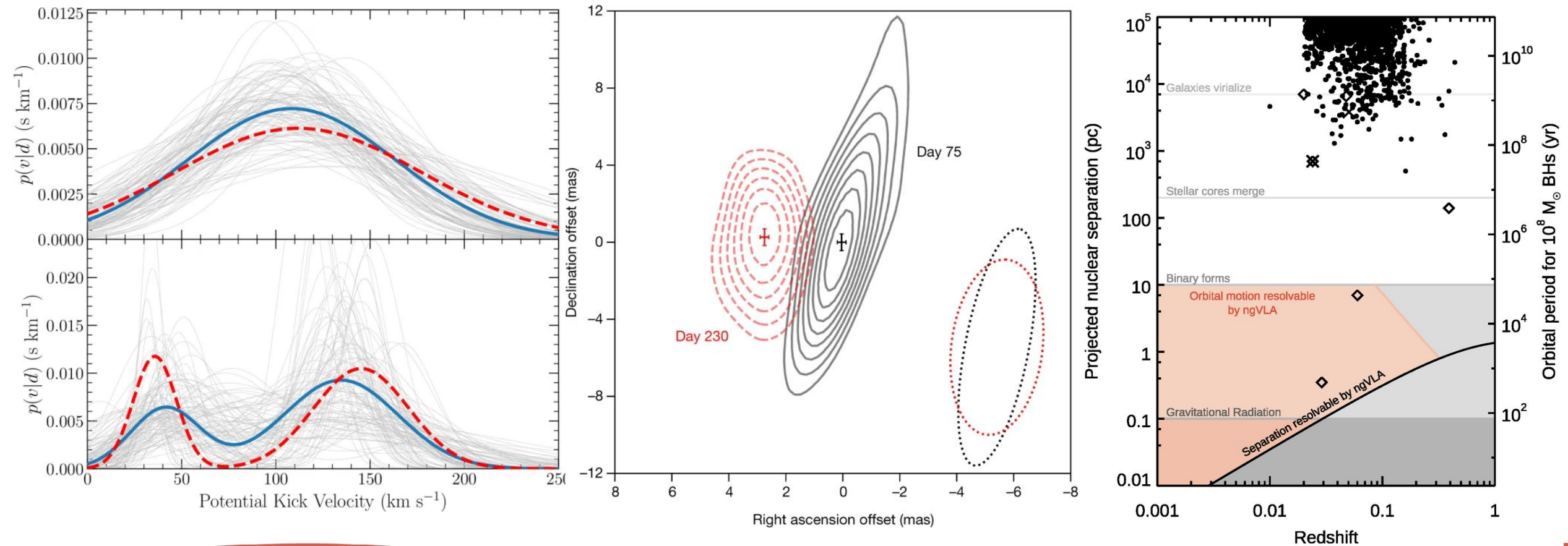
KSG3: Charting the Assembly, Structure and Evolution of Galaxies from



KSG 4:



KSG 5: Formation and evolution of stellar and supermassive black holes in the multimessenger era



Science Working groups

SWG 1: Stars, planetary systems and their origins

Brenda Matthews (NRC-Victoria), David Wilner (Harvard-Smithsonian)

SWG 2: Astrochemistry and the molecular origin of life

Brett McGuire (MIT), Jennifer Bergener (Chicago)

SWG 3: Galaxies and galaxy evolution

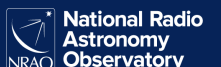
Fabian Walter (MPIA), Rachel Somerville (Flatiron/Rutgers)

SWG 4: Pulsars, cosmology and fundamental physics

Megan DeCesar (NRL/GMU), Alexander van der Horst (GWU)

SWG 5: Exploring the Dynamic Universe

Rachel Osten (STScI), Alessandra Corsi (Texas Tech)



New eyes on the Universe

- Meeting in Vancouver last month, aimed at bringing together the SKA and ngVLA communities. My takeaways:
- These facilities are complementary
 - High versus low frequency
 - nonthermal and HI for SKA
 - thermal, flat spectrum synchrotron and molecules/masers for ngVLA
 - Large collecting area and long baselines for ngVLA to do precision work on individual sources; wide field for surveys for SKA
- Community enthusiasm for both types of work is very high!
- Many science cases benefit from both, most do not require them simultaneously



Summary

- ngVLA contributes key capabilities across almost all areas of astrophysics
- Together with the SKA, it will bring on a new era in radio astronomy
- There are still plenty of opportunities to get involved

