

DISCUSSION POINTS:

LISA, MASSIVE BLACK HOLES,
AND THE COSMIC LANDSCAPE

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DETECTION CAPABILITIES

- WHAT ARE THE SEPARATE POPULATIONS TO WHICH LISA AND PTAS ARE SENSITIVE?
- HOW CAN WE TIE THE OBSERVATIONS TOGETHER IN ORDER TO UNDERSTAND THE FULL POPULATION?
- CAN ENVIRONMENTAL FACTORS SUCH AS DISCS, GAS, OR JETS PRODUCE MEASURABLE DEVIATIONS FROM GEODESIC MOTION FOR MAPPING SPACETIME?
- WHAT LEVEL OF DEVIATION FROM MODEL WAVEFORMS WOULD ENDANGER DETECTION?
- WHICH PARAMETERS CAN BE MOST ACCURATELY RECOVERED?

- **WITH ALL OTHER PARAMETERS FIXED, WHAT IS THE SMALLEST ECCENTRICITY THAT CAN BE RECOVERED?**
- **CAN PREDICTED RATES AND PARAMETER DISTRIBUTIONS AFFECT THE CHOICE OF DETECTION ALGORITHMS?**
- **HOW DO OVERLAPPING SIGNALS OF BOTH SIMILAR AND DIFFERENT TYPES AFFECT DETECTION AND PARAMETER RECOVERY?**

SMBH FORMATION SCENARIOS

- WHICH FORMATION SCENARIOS ARE MUTUALLY EXCLUSIVE, WHICH ARE COMPLEMENTARY?
- HOW ARE THEY DIFFERENTIATED IN GW OBSERVATIONS?
- HOW MANY SMBH INSPIRALS WOULD BE NEEDED TO DISTINGUISH BETWEEN DIFFERENT SCENARIOS?
- WHAT FIDELITY OF WAVEFORM MODELING IS NEEDED TO DISTINGUISH BETWEEN DIFFERENT SCENARIOS?
- HOW WILL OBSERVATIONS OF SPINS, MASSES, AND MASS RATIOS INFORM US ABOUT SMBH AND GALAXY EVOLUTION?

- **WHICH PARAMETERS TELL US MORE ABOUT SMBH FORMATION SCENARIOS?**
- **WHICH PARAMETERS TELL US MORE ABOUT THE SMBH BINARY EVOLUTION FROM PAIRING TO COALESCENCE?**

EM (AND OTHER) COUNTERPARTS

- WHAT IS THE TIME DELAY BETWEEN GW AND EM EMISSION/DETECTION?
- IS THIS TIME DELAY POSITIVE OR NEGATIVE? (I.E. CAN THERE BE AN EM PRECURSOR TO A GW EVENT?)
- CAN WE MATCH INDIVIDUAL EVENTS OR DO WE NEED TO BUILD UP STATISTICALLY SIGNIFICANT CORRELATIONS?
- HOW DO WE TIE LISA, PTAs, AND EM OBSERVATIONS TOGETHER TO IMPROVE UNDERSTANDING OF THE POPULATION AND COSMOLOGY?
- WHAT IS THE NATURAL VARIABILITY OF SMBH HOST GALAXIES AND AGN?

- **WHAT OTHER TRACERS OF SMBH SINKING AND MERGING SHOULD BE SEARCHED FOR (AND OBSERVED)?**
- **HOW WILL THE ERROR BOXES OF LISA COMPARE WITH THE FIELDS OF VIEW OF CONTEMPORANEOUS RADIO, OPTICAL/IR, AND X-RAY/GAMMA-RAY INSTRUMENTS?**
- **WHAT MECHANISMS CAN PRODUCE EM COUNTERPARTS TO GW EVENTS?**
- **WHAT IS THE INCREASE IN KNOWLEDGE IF WE SEE AN EM COUNTERPART?**
- **CAN THE LIKELIHOOD OF AN EM COUNTERPART BE SEEN IN THE GW DATA? (I.E. BASED ON THE GW SIGNAL, CAN WE PREDICT WHAT KIND OF EM COUNTERPART/SIGNAL TO SEARCH FOR?)**

- **WHAT IS THE LIKELIHOOD OF SIGNIFICANT RECOIL AT MERGER AND HOW DOES THIS AFFECT THE SEARCH FOR EM COUNTERPARTS?**
- **DOES THE ENVIRONMENT OF THE BINARY HAVE AN EFFECT ON THE RECOIL AT MERGER?**