



DESGW/J-GEM all-sky kilonova discovery program

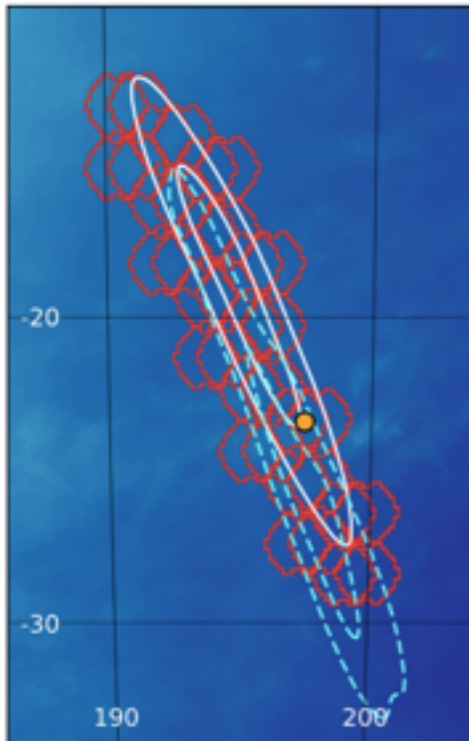
James Annis (Fermilab)

& Nozomu Tominaga (Konan University)

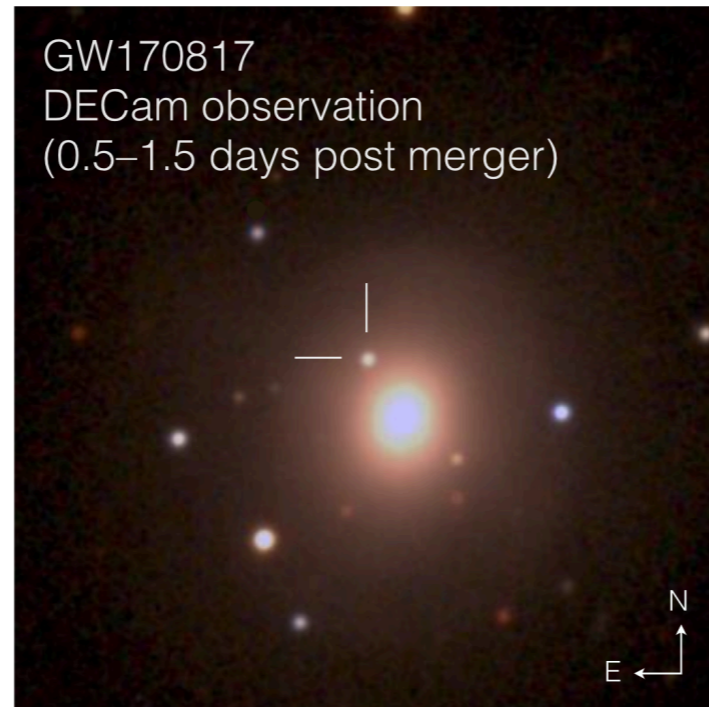
Marcelle Soares-Santos (Brandeis)

& Masaomi Tanaka (NOAJ)

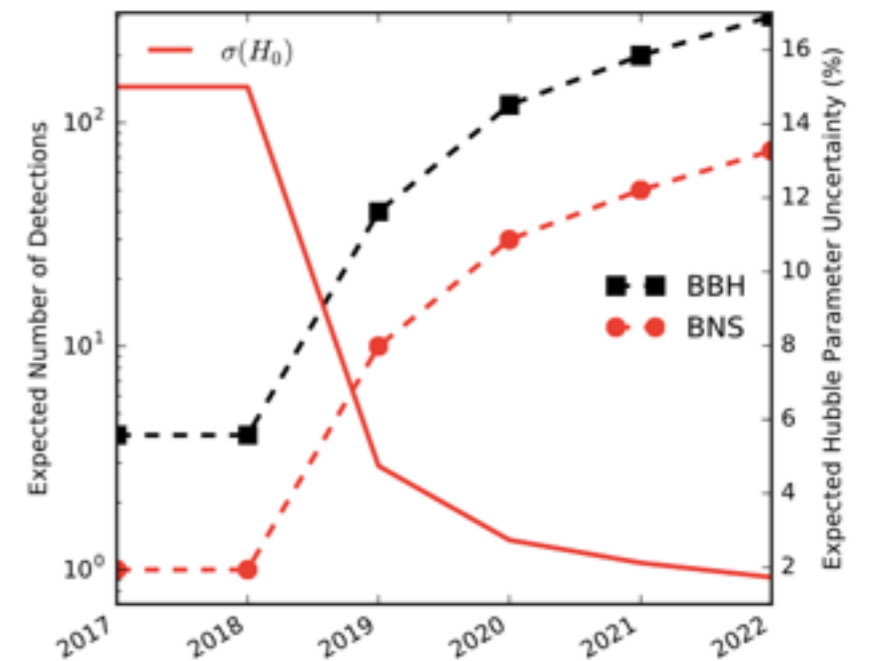
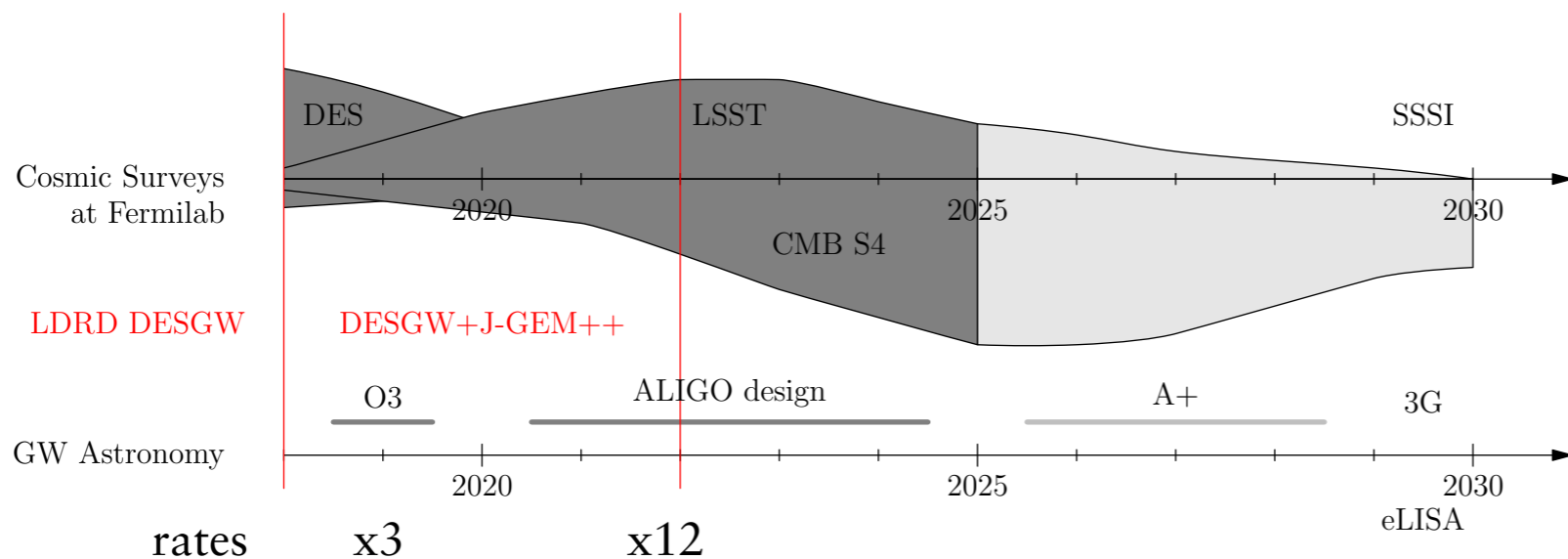
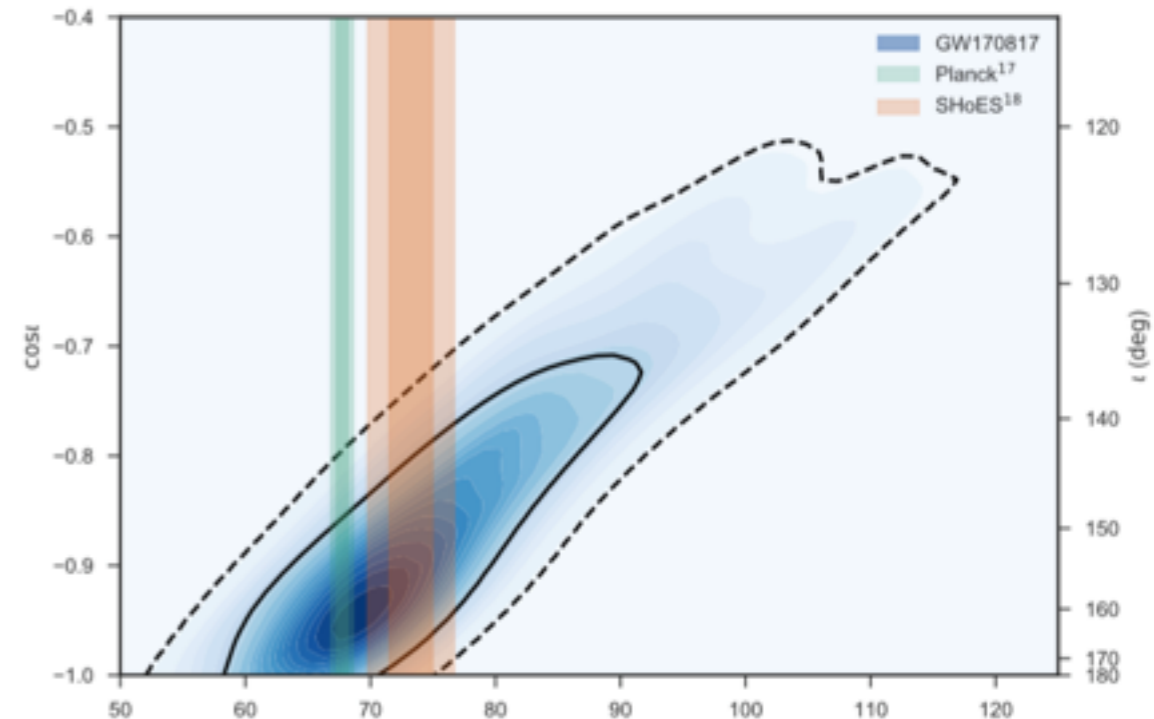
Search



Discover



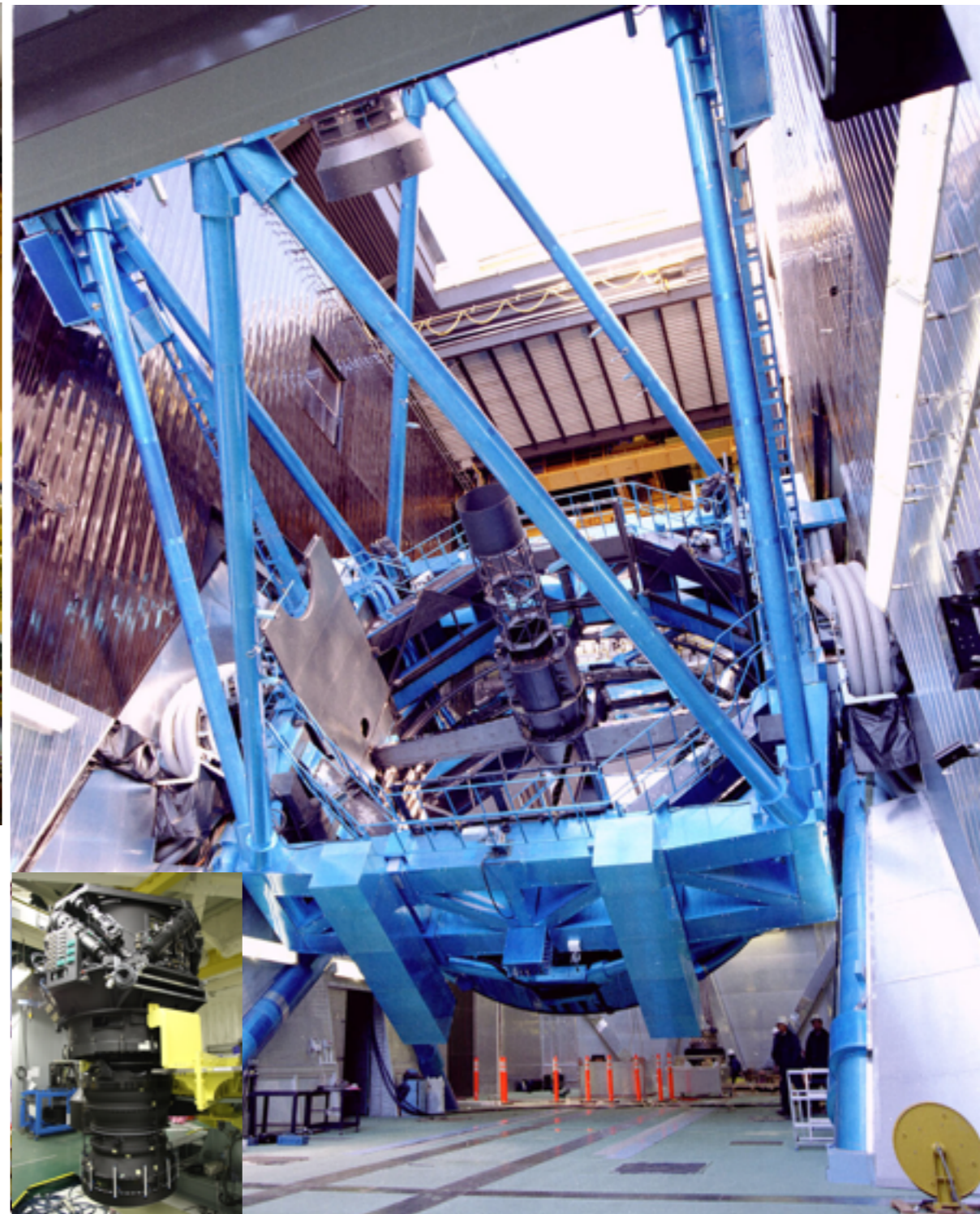
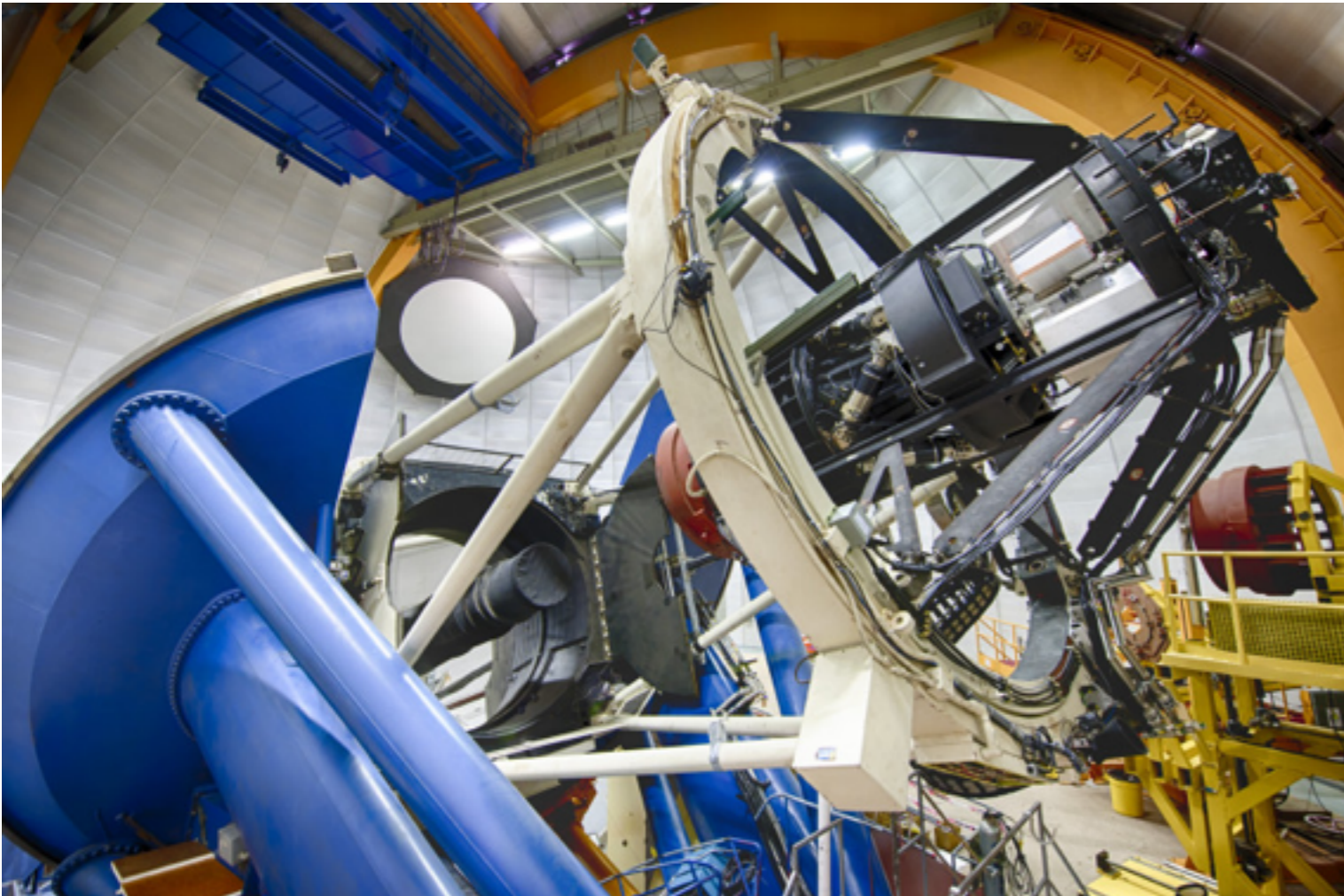
Measure cosmology



DESGW/J-GEM all-sky kilonova discovery program

Blanco+DECam

Subaru+Hyper Suprime-Cam (HSC)



Telescope/Camera	Diameter [m]	Field of view [deg ²]	Etendue [m ² deg ²]
Subaru/HSC	8.2	1.75	92
Blanco/DECam	4	3	38
LSST	6.7	9.62	339

Table 1: List of wide-field cameras, current (top) and future (bottom).

DECam: 520 Megapixels

HSC: 900 Megapixels

LSST: 3200 Megapixels



Our proposal is to develop an efficient all-sky search and discovery program for kilonovae. This collaboration involves the two premier teams in this emerging field: DESGW and J-GEM.

Our opportunity is to complete areas, colors, and/or epochs by taking advantage of the complementary capability of DECam and HSC to search both the South and North.

Work to be done:

1. study and simulate **survey strategy** cooperation:
sky area, colors, epochs, $+30^\circ$ to -40° overlap, 7^{hour} longitude difference
2. prototype **image processing**:
search difference imaging using two different camera, software stacks

If we demonstrate a strong increase in efficiency, and our collaborating makes our groups stronger, then we will submit a multi-year grant in the following cycle.

Budget Table

Budget Request to DOE (in USD)

Name	Affiliation	FY 2018 Request
James Annis	Fermi National Accelerator Laboratory	\$51,672
Marcelle Soares-Santos	Brandeis University	\$50,000
Total		\$101,672

Budget Request to KEK (in kJPY)

Equipment and Supplies Cost	k¥7,400
Travel Costs	k¥1,600
Total	k¥9,000