



# NOIRLab

*Stuartt Corder*

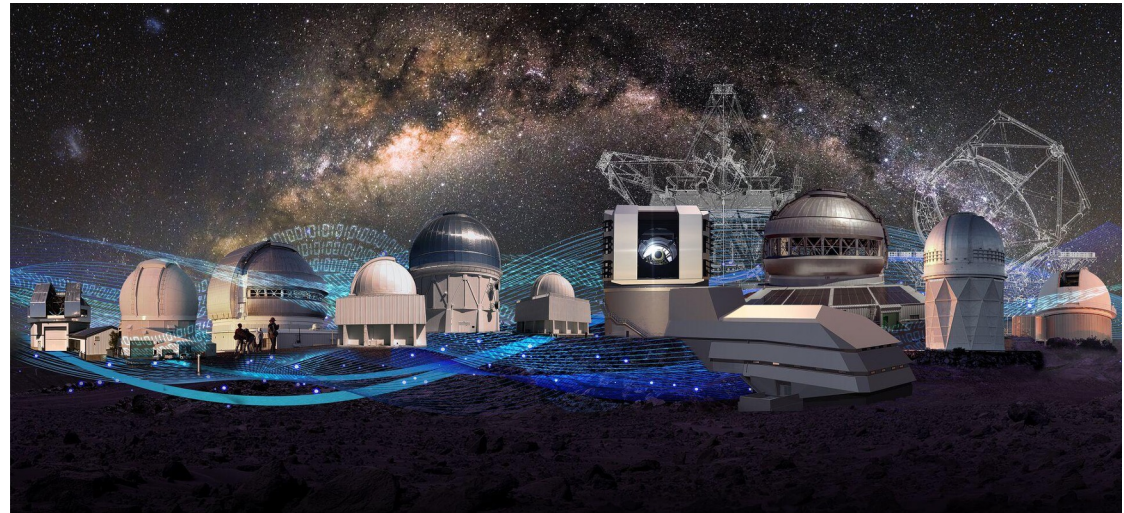
NSF NOIRLab

*Discovering Our Universe  
Together*



# Mission

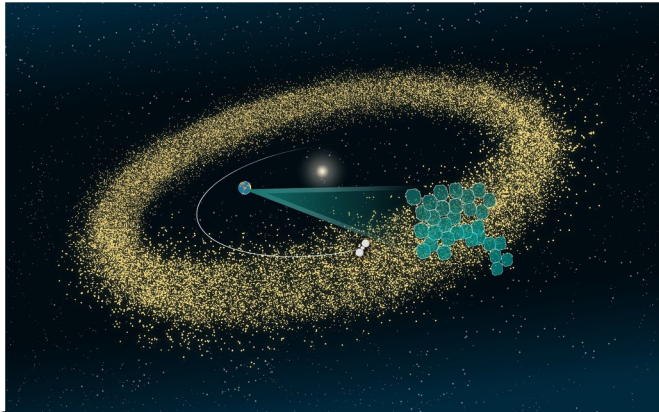
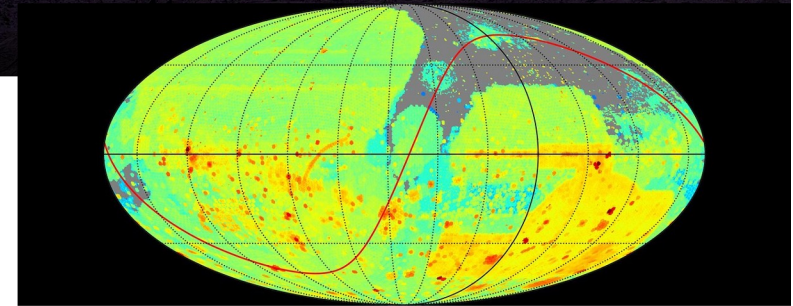
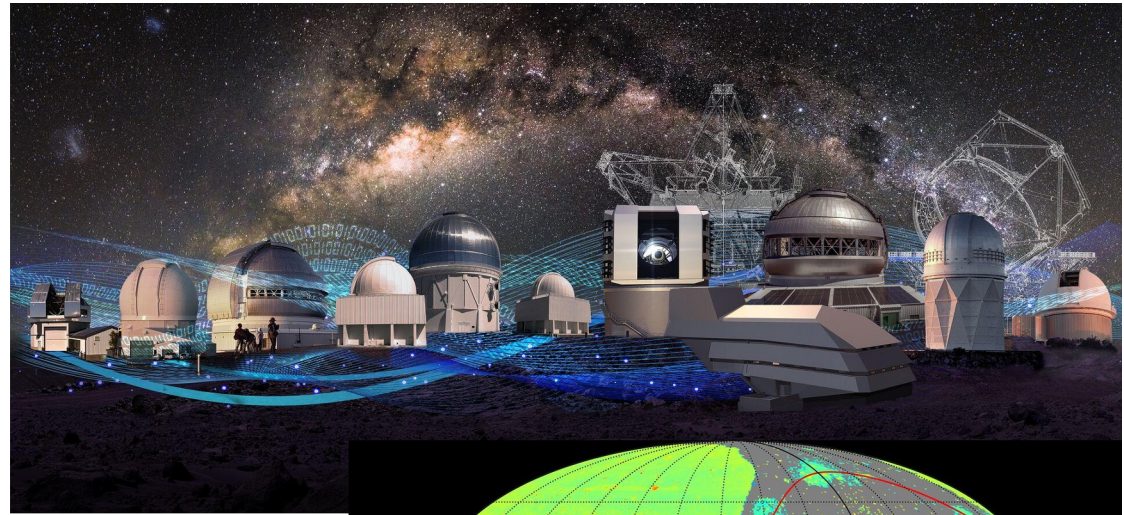
Enabling and sharing breakthrough discoveries in astronomy and astrophysics with state-of-the-art **ground-based observatories**, data products, and services for our community.





# Mission

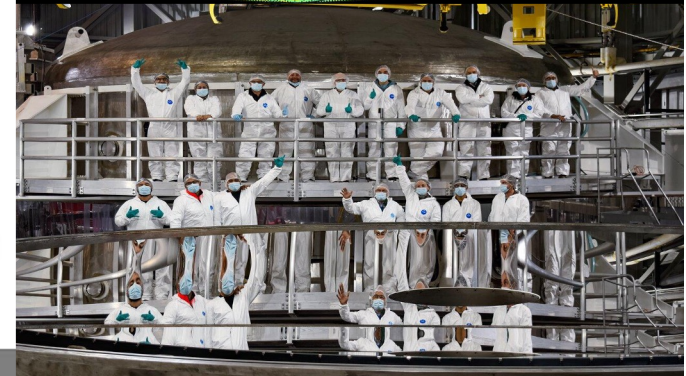
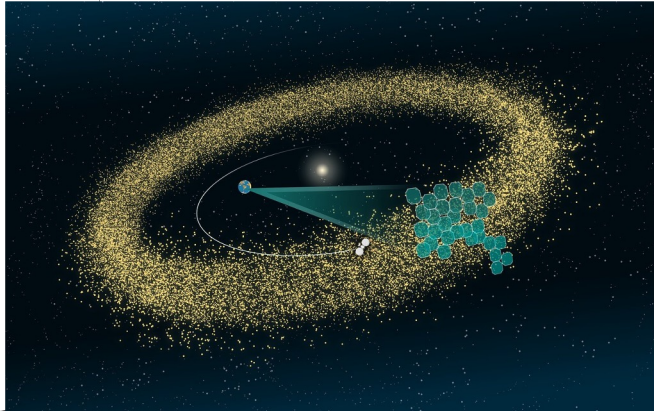
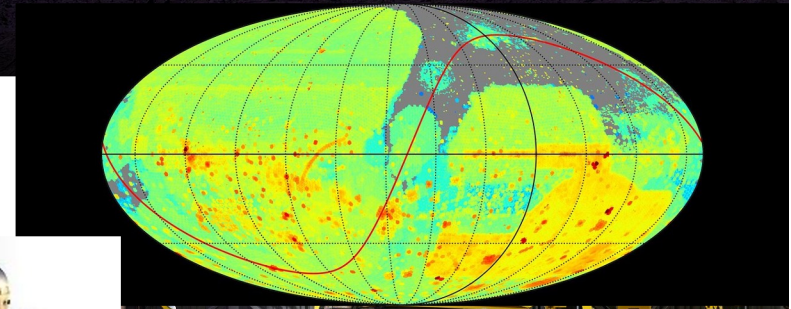
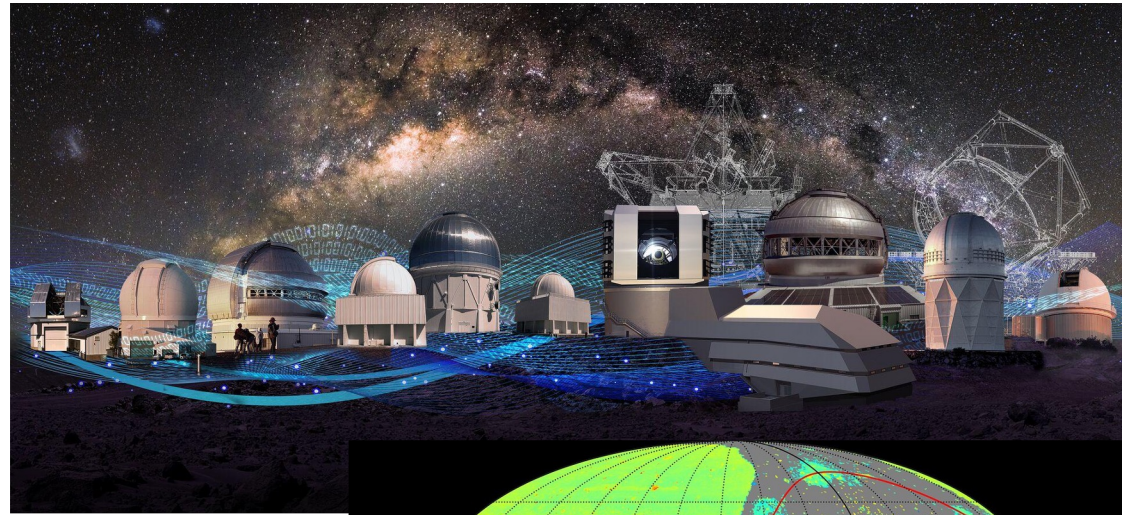
**Enabling** and sharing  
breakthrough discoveries in  
astronomy and astrophysics with  
state-of-the-art **ground-based  
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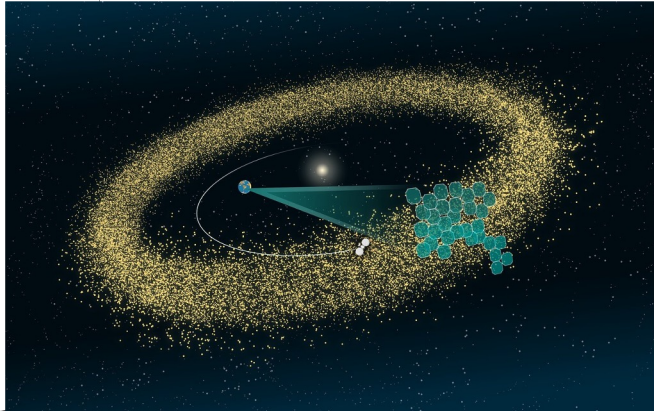
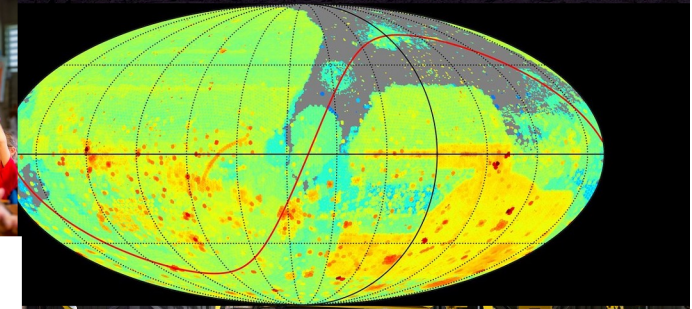
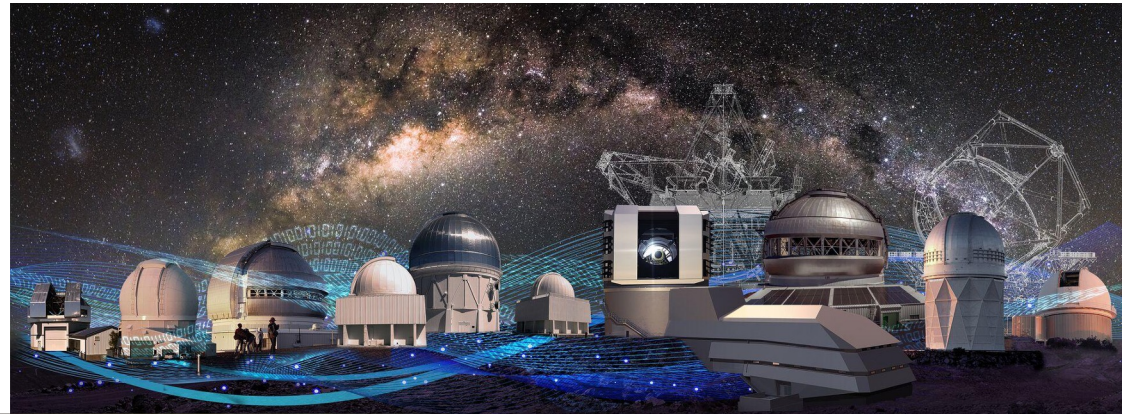
Enabling and sharing breakthrough discoveries in astronomy and astrophysics with state-of-the-art **ground-based observatories, data products, and services** for our community.





# Mission

Enabling and sharing breakthrough discoveries in astronomy and astrophysics with state-of-the-art **ground-based observatories**, **data products**, and **services** for our **community**.

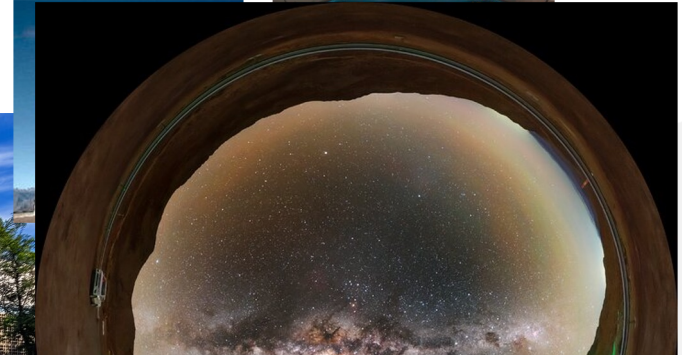




# NOIRLab Universe



~4 million lines of code



665/10 virtual machines/clusters, 523 pieces of network equipment and 5 data centers with ~600 TB (pre-Rubin)



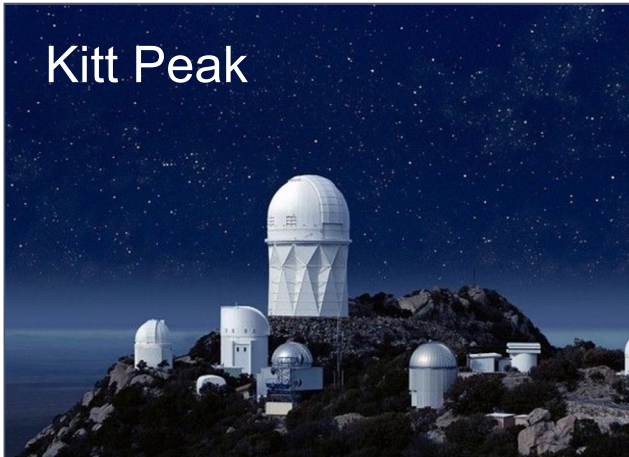
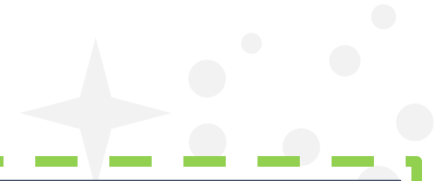
mountains  
12  
0 transformers



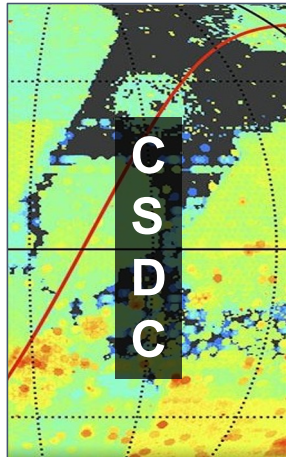
66 miles of road with 30 heavy and 136 light vehicles



Together



Kitt Peak



SDSS



Gemini

*With our international partners*



Cerro Tololo



Rubin Observatory Operations

*An NSF-DOE Partnership*



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# Diverse and Powerful Tools



Rubin



Gemini S



Gemini N



Blanco



SOAR



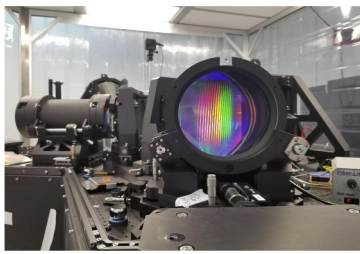
Mayall



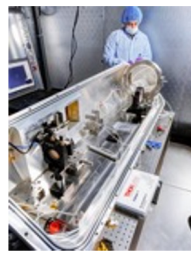
WIYN



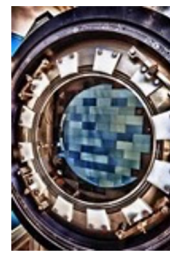
LSSTCam  
SLAC  
@Rubin



GHOST  
HIA/AO  
@Gemini S.



MAROON-X  
U. Chicago  
@Gemini N.



DECam  
FermiLab  
@Blanco



DESI  
LBNL  
@Mayall



NEID  
Penn State/NASA  
@WIYN



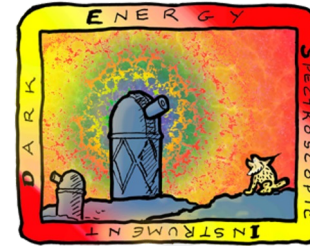
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# Partnerships are at the core of our operations & development activities



- Public Universities
- Private Universities
- Federal Agencies
- National Laboratories
- International Institutions

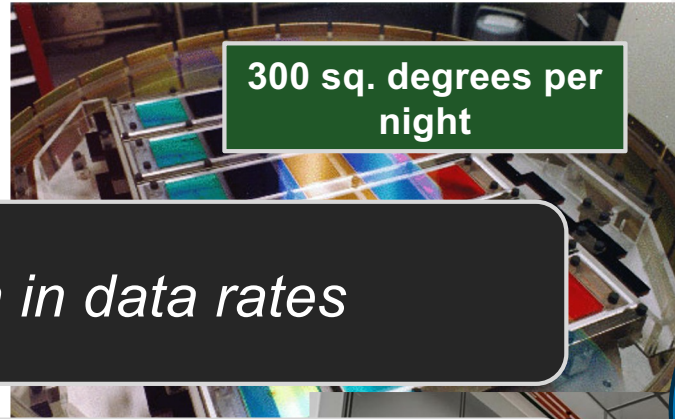




1990

18,000 redshifts  
In 5 years

Discovery of  
Large Scale  
Structure in  
the Universe  
and probes of  
dark  
energy/matter



300 sq. degrees per  
night

*10<sup>3</sup> gain in data rates*

*Data is no longer scarce — the  
challenge now is managing the data*

Galaxy  
Evolution  
Supernovae  
as probes of  
the expansion  
history



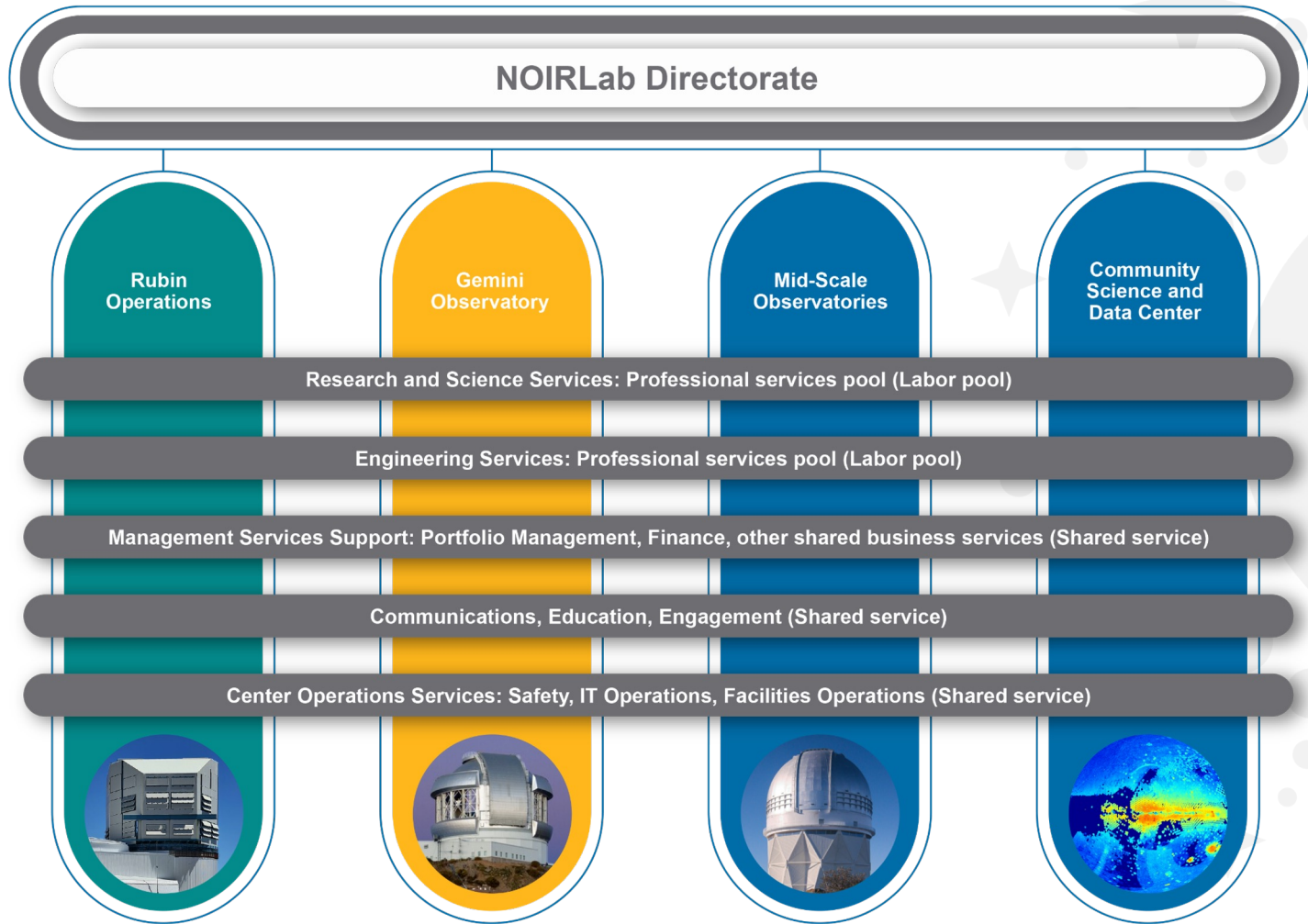
100,000 redshifts  
per night!



10,000 sq. degrees  
10<sup>7</sup> alerts per night!



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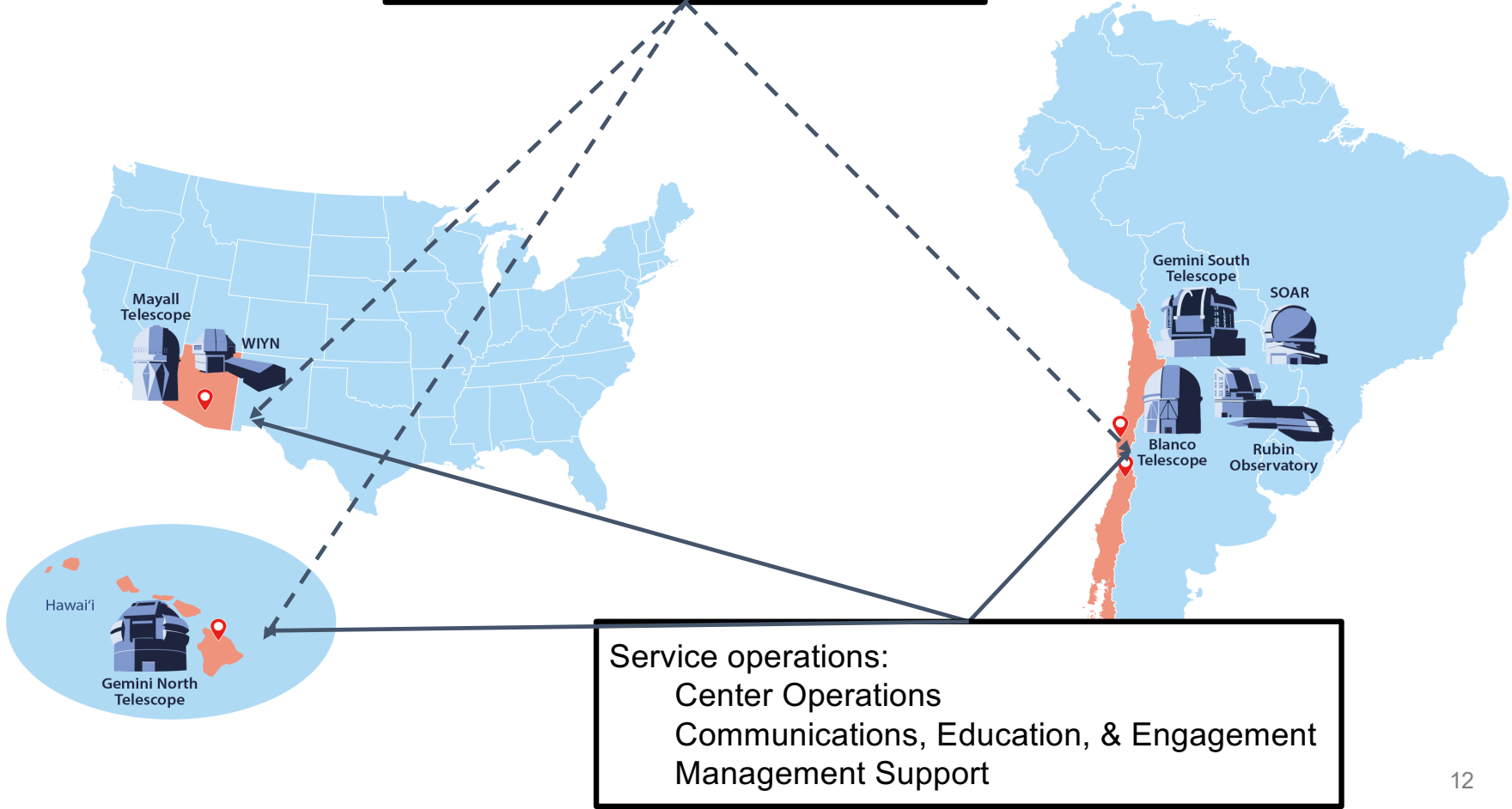




# NOIRLab Matrix & Services



Matrix operations:  
 Engineering Services  
 Research & Science Services





MILESTONE / HITO

# First Public Real-Time Alert Stream

*Primer flujo público de alertas en tiempo real*



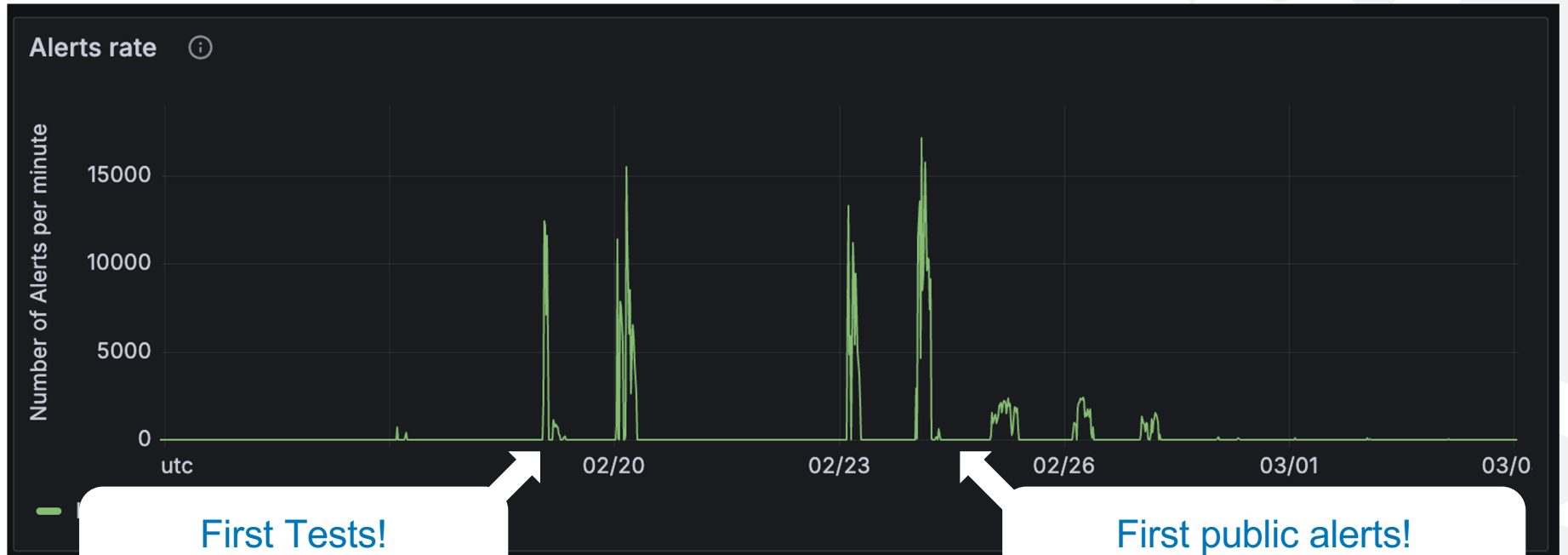
2 min!!

From each detection to the alert publication

Desde cada detección a la publicación de la alerta

More than 2 million alerts in a single night!!!

¡¡¡Más de 2 millones de alertas en una noche!!!



First Tests!

¡Primeras pruebas!

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First public alerts!

¡Primeras alertas públicas!

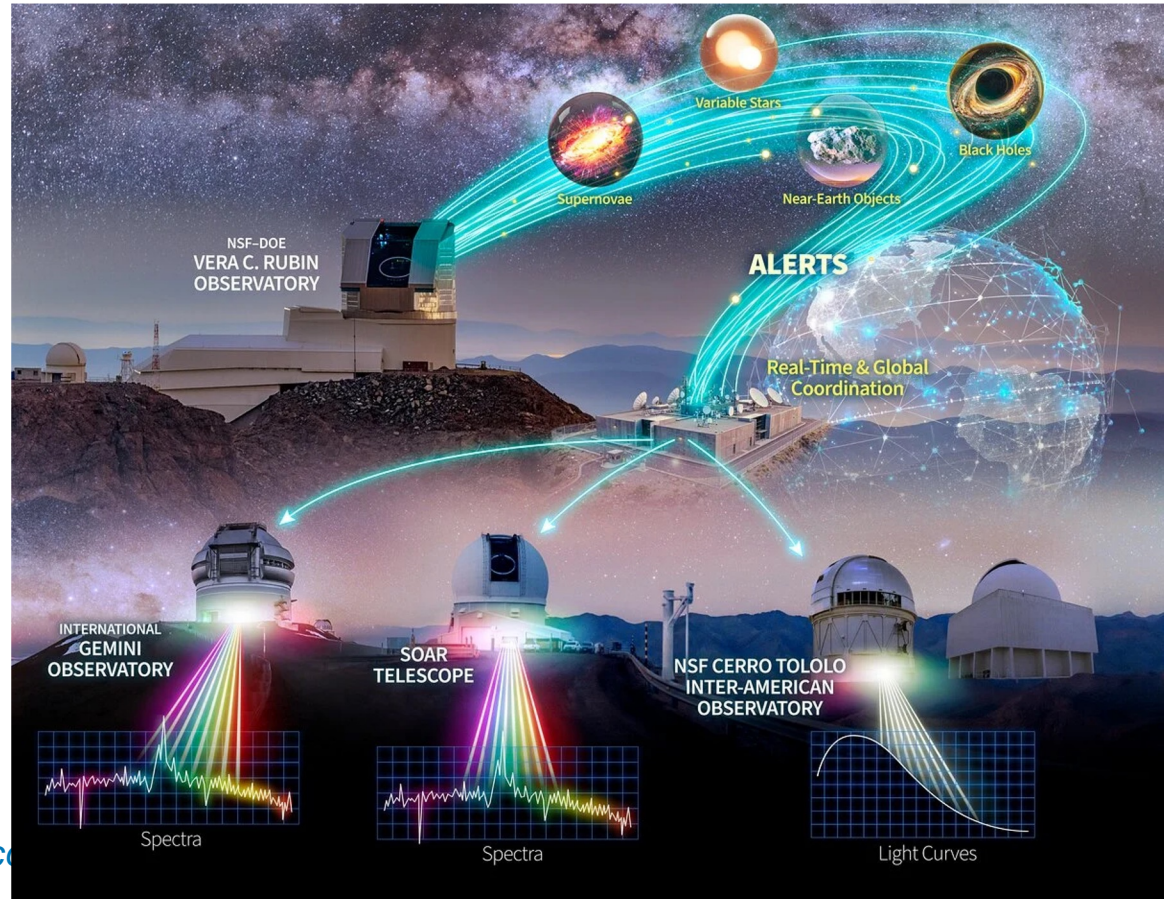
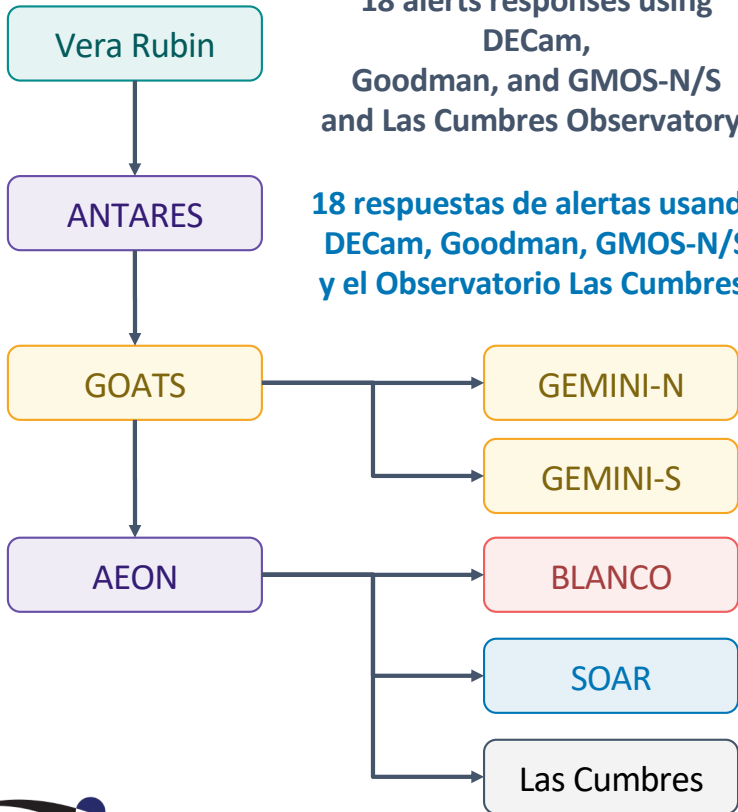




MILESTONE / HITO

# First Public Real-Time Alert Stream

*Primer flujo público de alertas en tiempo real*



Disc



MILESTONE / HITO

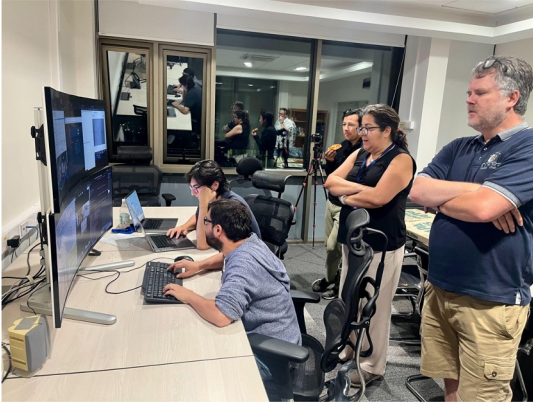
# First Public Real-Time Alert Stream

*Primer flujo público de alertas en tiempo real*



A NOIRLab & community major milestone achieved!

¡Un gran hito de NOIRLab y de la comunidad logrado!



Together



Thank you,  
Mahalo,  
Sap'e,  
Muchas Gracias!