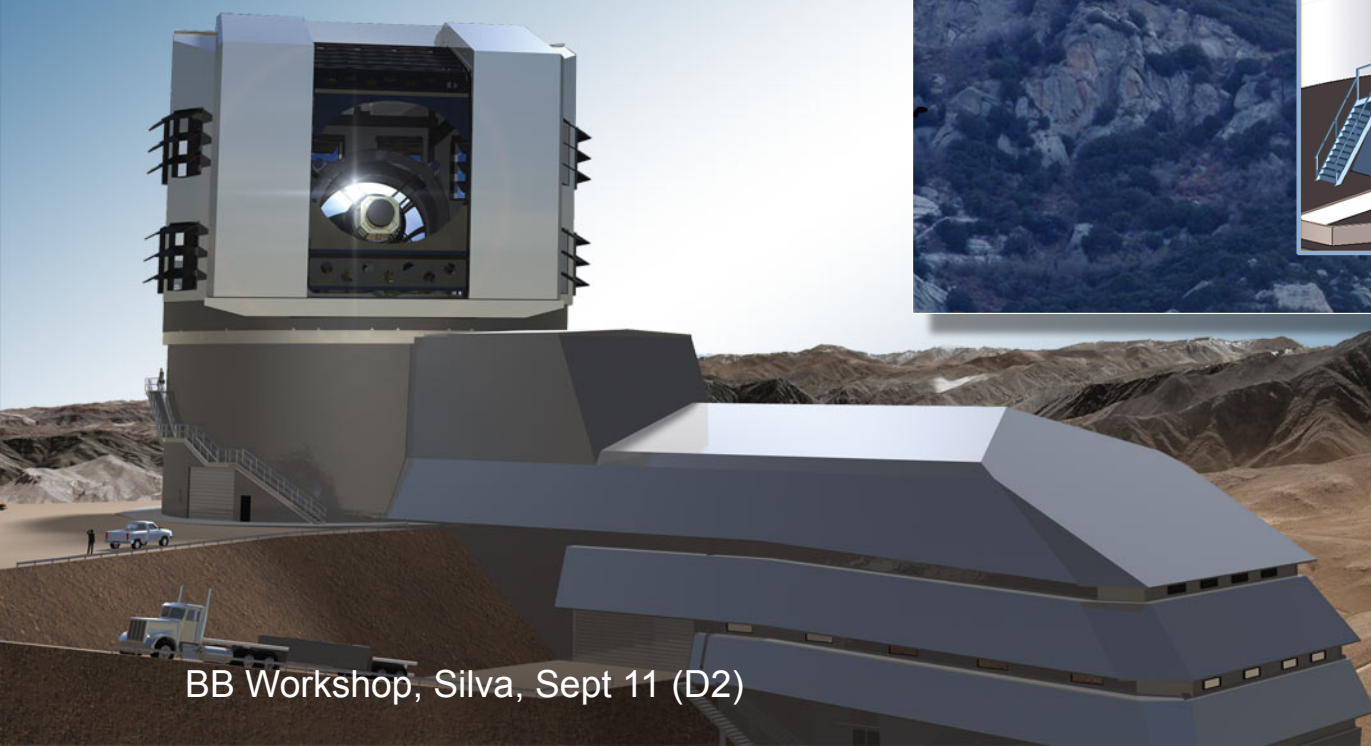
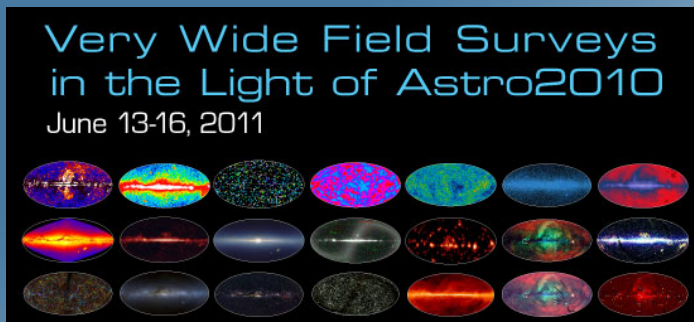


Landscape 2020

David Silva (NOAO)





Welcome!

Thanks for being here!



Big Questions... ...that capture my imagination

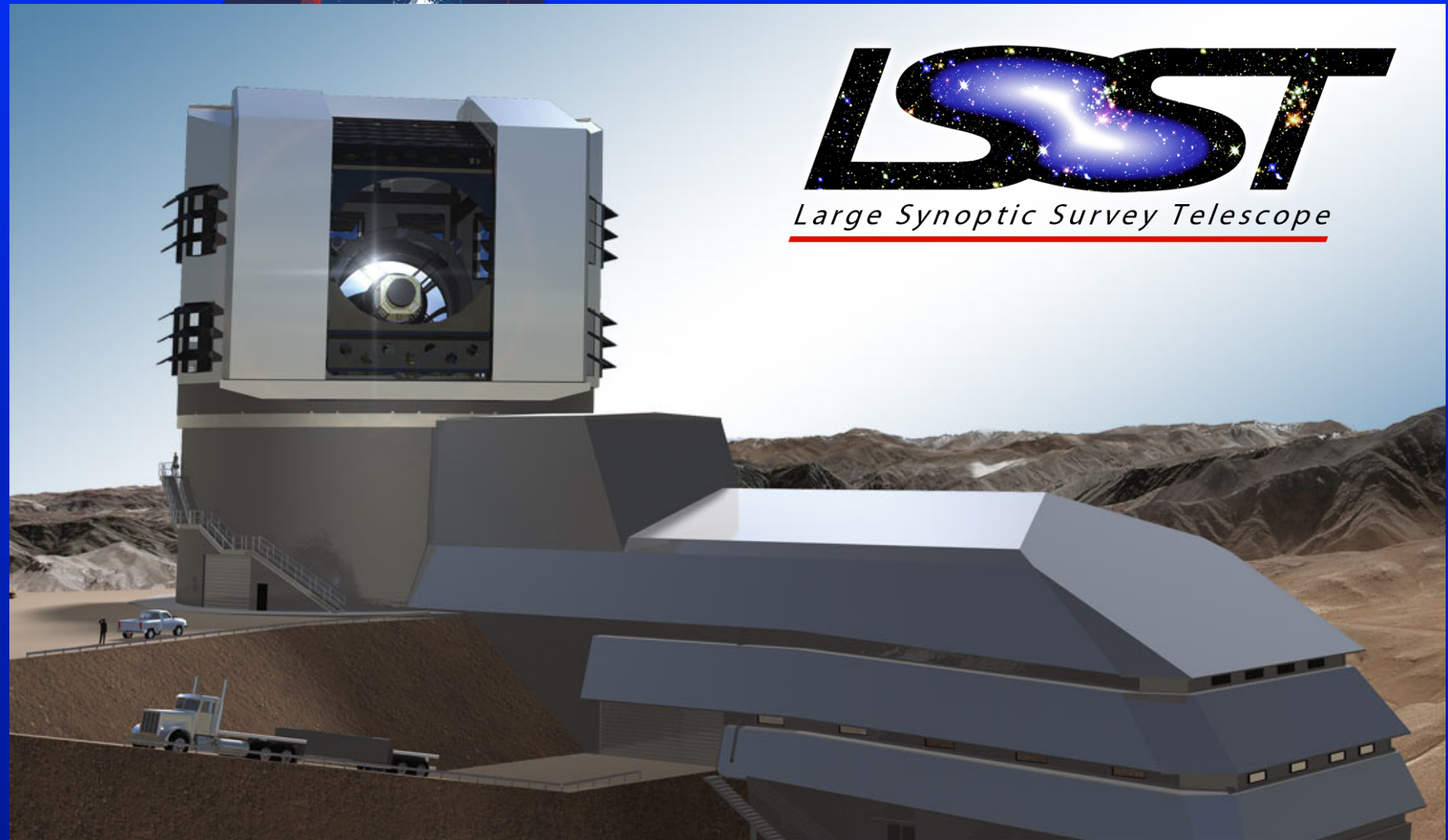
- Is there life on other worlds?
- What is dark matter?
- What is dark energy?
- What lies beyond the Standard Model?
- What will opening the gravitational wave window reveal?

- What can we afford to do?
- How do we maximize science return?



Exploring the 4D universe

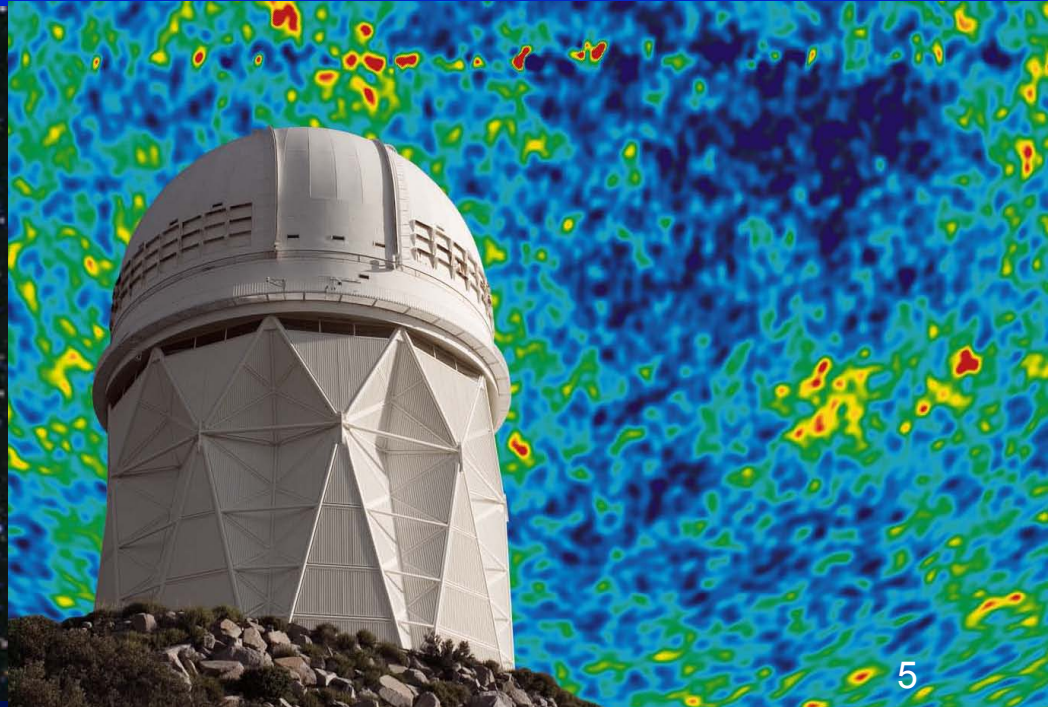
Cataloging positions & time-variability





Ancillary benefits of survey projects

- Primary data sets are highly accessible and reusable
- Instruments are world-best, enable other great projects
- Foster cross-agency (DOE/NASA/NSF) collaboration
- Foster major international collaborations
- Leverage Federal investment in existing facilities



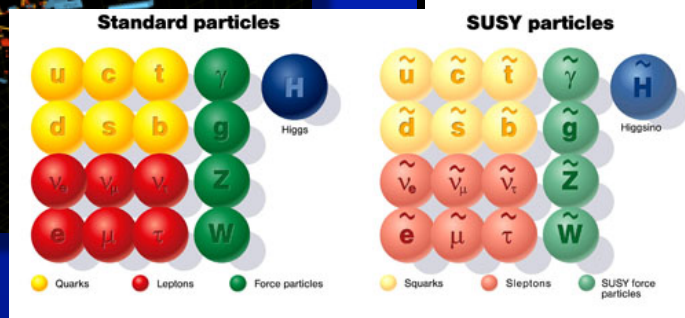
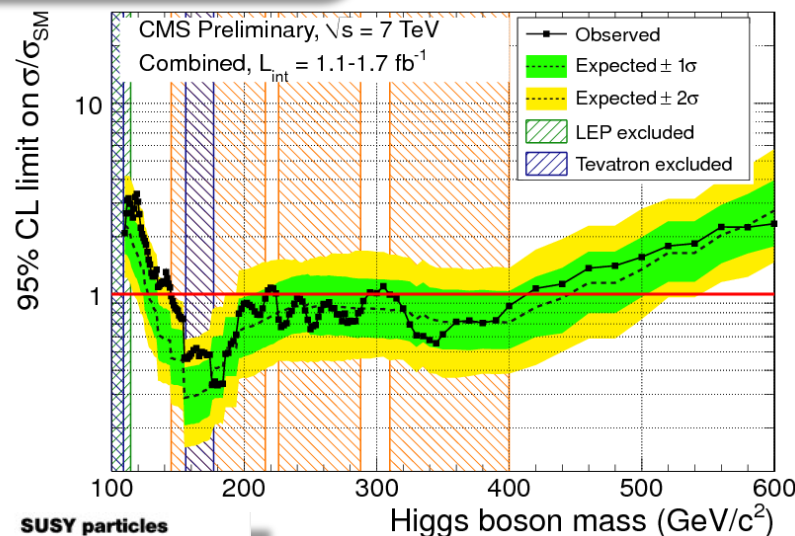
Beyond the Standard Model?

Large Hadron Collider

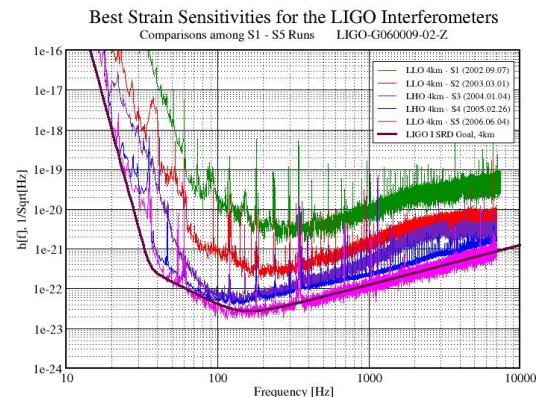
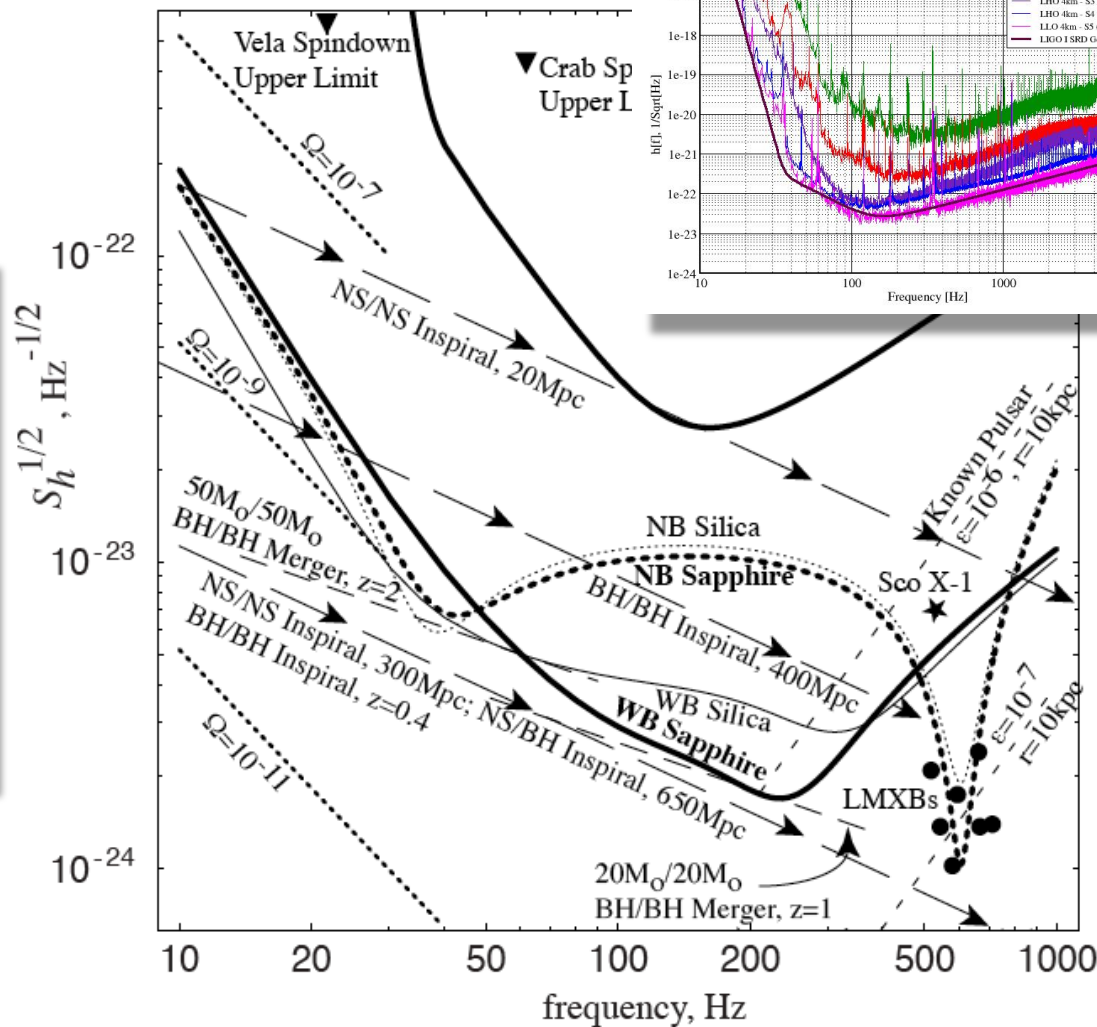
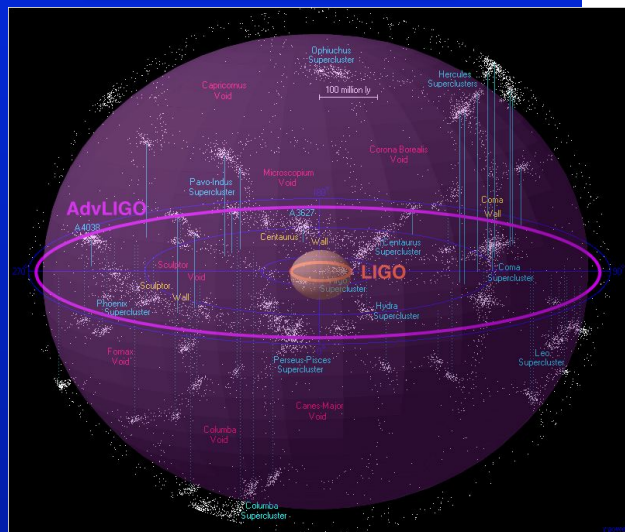
"These are exciting times for particle physics," said CERN1's research director, Sergio Bertolucci. "Discoveries are almost assured within the next twelve months. If the Higgs exists, the LHC experiments will soon find it. If it does not, its absence will point the way to new physics."

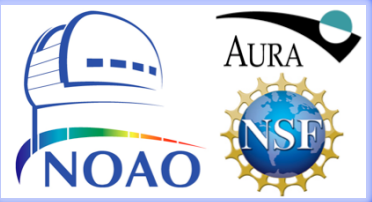


Compact Muon Solenoid (CMS)

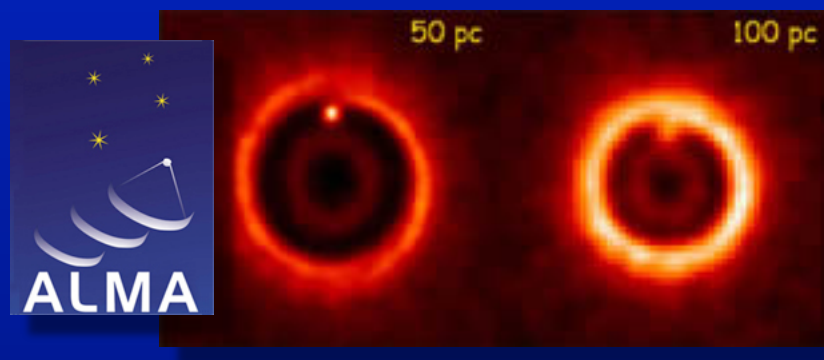
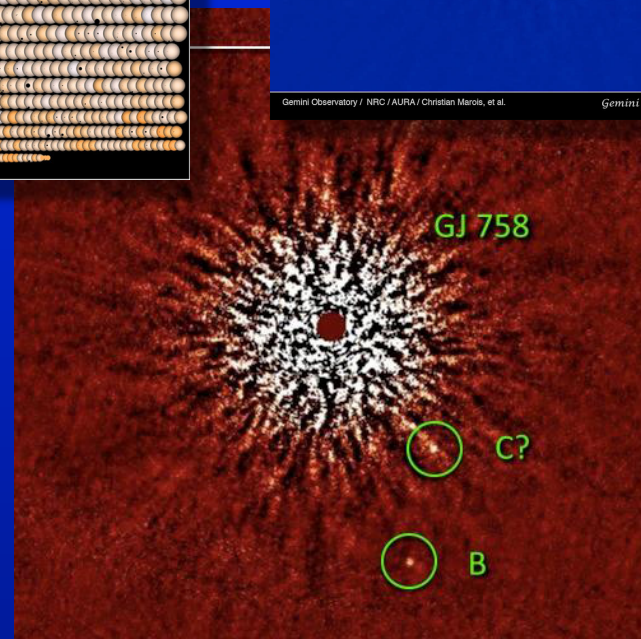
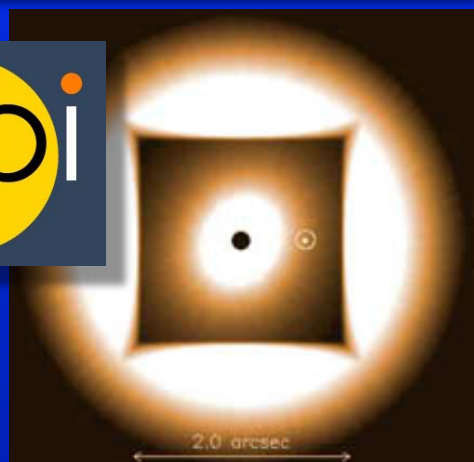
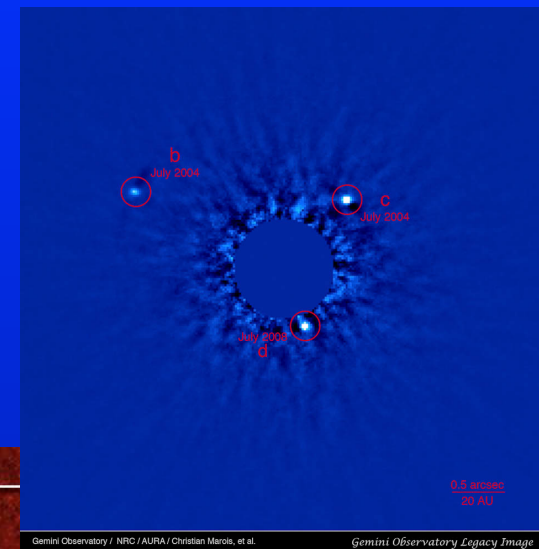
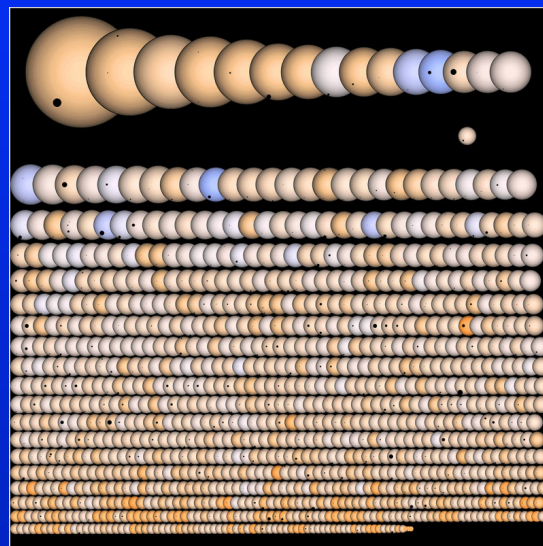


Gravity wave astronomy Advanced LIGO





Exoplanet discovery / characterization





- No major “first lights” before 2020
 - Not JWST, WFIRST, Euclid, GMT, TMT, E-ELT, or SKA
 - **LSST = maybe?**
 - Are “Facilities 2010” the baseline for next 10+ years?
- Federal investment in astronomy = “flat” or declining
 - **For many years!?**
 - Do we maximize science impact of current facilities?
 - Or do we terminate current facilities to enable future facilities?

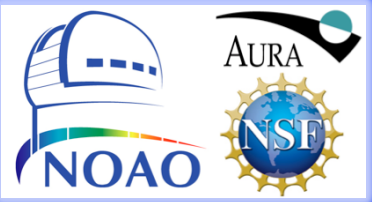


OIR Facilities 2020

A cost-efficient, high impact model

- Platforms for wide-field joint NSF-DOE surveys
 - NOAO Mayall 4-m, Blanco 4-m → DES, BigBOSS
 - Large Synoptic Survey Telescope (LSST) (not yet funded)
- Platforms for general purpose research (and some targeted surveys)
 - Keck I, Keck II
 - Gemini North, Gemini South
 - Large Binocular Telescope
 - Magellan, MMT
- Network of medium aperture, general purpose, non-Federal and Federal-partner facilities
 - APO, DCT, Lick, SOAR, WIYN...

ALMA, eVLA
Complementary



Towards a stronger national observatory

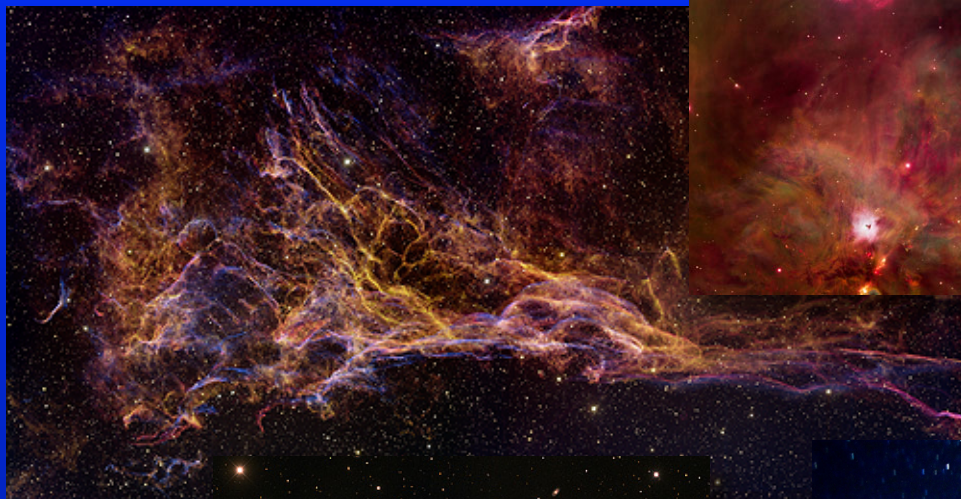
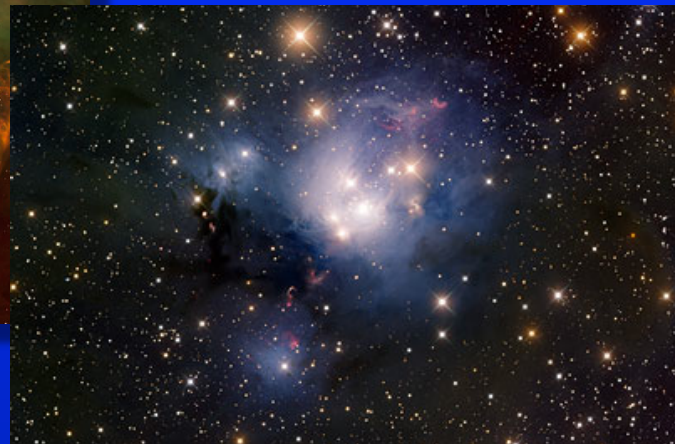
A clear path to excellence exists to a stronger national observatory within a stronger US OIR System

The Ground-Based Stage IV BAO Experiment BigBOSS

- Retain the capability to build new instrumentation
- Retain the capability to build new data systems & archives
- Form bi-lateral partnerships with other interested parties

This is achievable and the time is now

Images from KP Mayall 4-m



Astronomical images: A. Rector/U. of Alaska Anchorage,
H. Schweiker/WIYN and NOAO/AURA/NSF
Kitt Peak at night: M. Williams, MessiestObjects