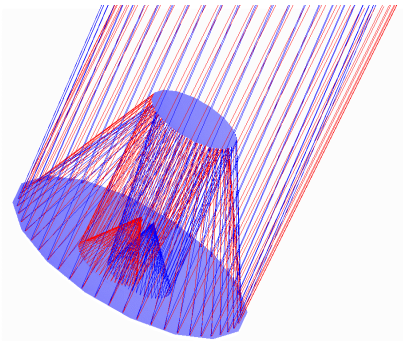
Executive Summary

This strategic plan outlines a program that will ensure continued US leadership in groundbased astronomy well into the next century, and specifically defines the role of the National Optical Astronomy Observatories in achieving this goal.

This plan calls for the construction by 2025 of the following major facilities:

- ***An Advanced Solar Telescope*** – which will provide the 0.1 arcsec resolution and the large aperture required to characterize the rapidly changing magnetic fine structure on the surface of the Sun.
- ***Two Wide-Field Telescopes*** – with apertures of at least 6.5-m and 3º field of view, in order to conduct deep imaging and spectroscopic surveys to explore such issues as the evolution of galaxies and the nature of dark matter; to define the population of the solar system, including both asteroids and Kuiper Belt objects; and to study variable objects, including supernovae
- ***An Extremely Large Telescope (ELT)*** – with an aperture on the order of 30 m to enable near-infrared spectroscopy to limiting magnitudes 10 times fainter than NGST
- ***The Maximum Aperture Telescope (MAXAT)*** –which will have an aperture of 50 m or more and will achieve diffraction-limited imaging, and/or
- ***The 1-km OIR Interferometric Array*** – for high angular resolution studies of stellar surfaces, active galactic nuclei, circumstellar environments, and reconnaissance of small bodies in the solar system.



Wide Field Telescope
page 12

During the next five years, NOAO plans to:

Initiate development of technology for:

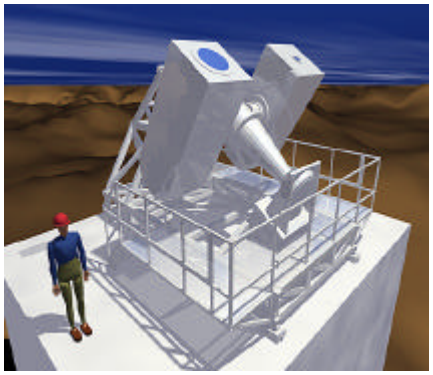
- The Extremely Large Telescope (ELT)
- The Maximum Aperture Telescope (MAXAT)

Begin construction of:

- The Advanced Solar Telescope (AST)
- The Wide Field Telescopes (WFT)

Complete construction of:

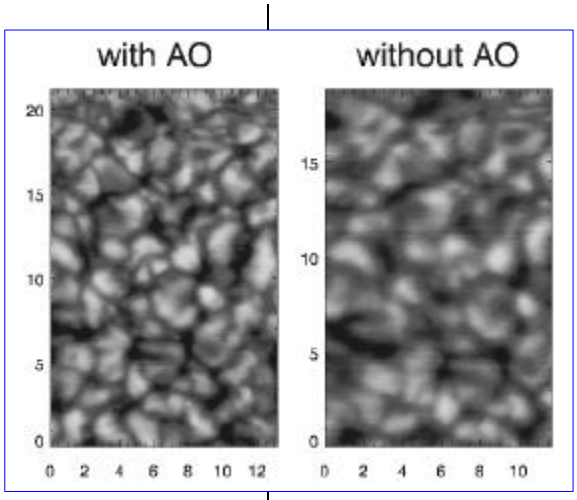
- SOLIS – a facility to provide long term observations of solar activity
- SOAR – a 4-m telescope in the southern hemisphere optimized for superb image quality
- GONG ++ – a network that will characterize solar oscillations and enable local helioseismology over a solar cycle



SOLIS
page 18

Develop:

- Solar Adaptive Optics
- Solar IR spectroscopic and imaging capability
- A major instrument for Gemini — either a multi-object infrared spectrograph or a high-stability optical spectrograph
- Wide-field IR imagers for both CTIO and KPNO
- Wide-Field High-Throughput Spectrograph for KPNO
- IR Spectrograph for CTIO



Solar Adaptive Optics page 11

Implement:

- New observing modes – including queue, service, and remote observing for both solar and nighttime astronomy
- The infrastructure required to support science of scale for both solar and nighttime astronomy: observing protocols, pipeline processing, data archiving, data mining, and provision of data products, such as deep imaging surveys, characterization of solar activity, and GONG measurements

Provide Integrated Access to:

- Gemini North and South
- NOAO-operated facilities at CTIO, KPNO, and NSO
- Hobby-Eberly Telescope
- MMT
- The South Pole

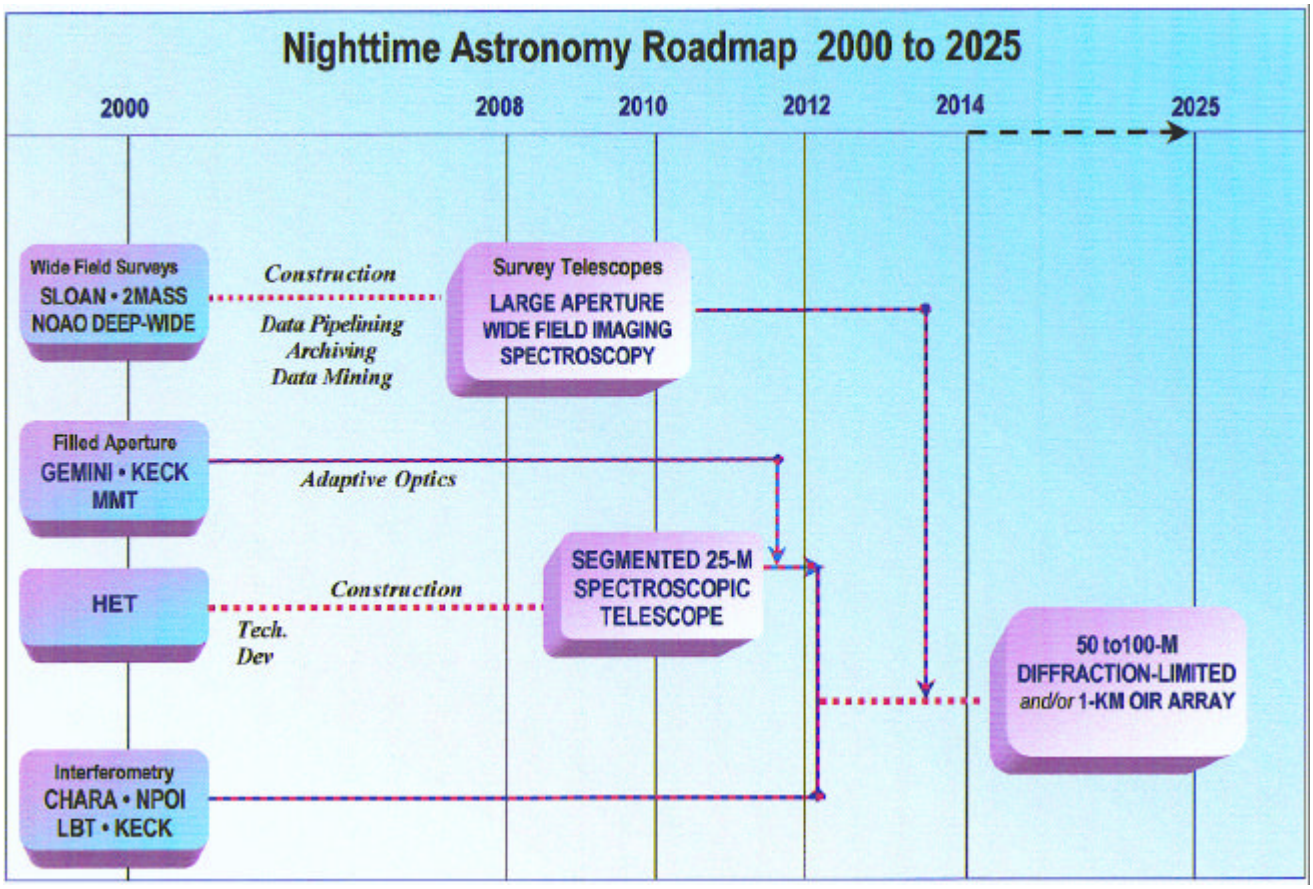
Expand Public Education and Outreach Programs through

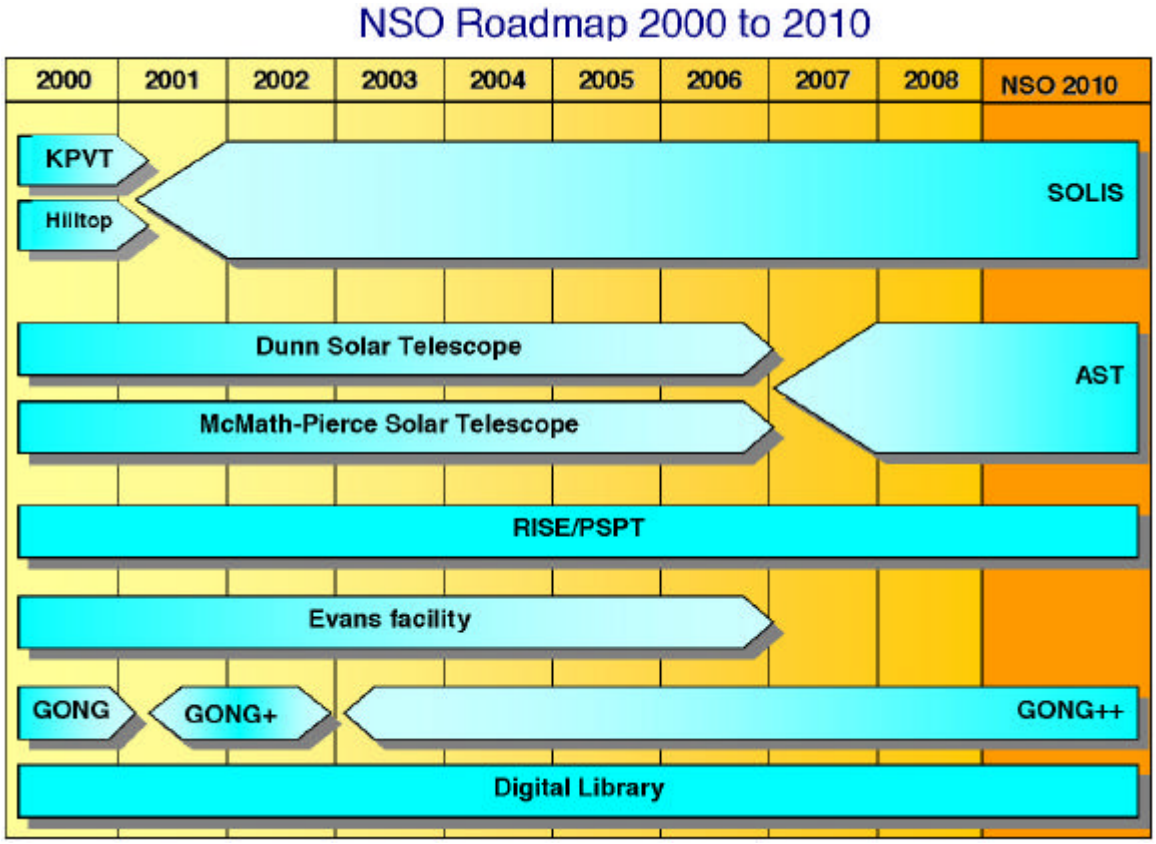
- Support of research by both graduates and undergraduates
- Teacher training in research-based science education
- Lesson plans and distribution of selected data sets via the Web
- Visitor Center programs
- Interactions with the press

Research Experiences for Undergraduates page 30

NOAO will seek to carry out all of the major facilities construction and technology development projects—along with many of the instrumentation projects—in close collaboration with the independent observatories and the university community. Such partnerships will leverage investments of both Federal and non-Federal funds to accomplish much more than any single group could achieve alone.

Timelines for the solar and nighttime programs are shown on the next page.


Nighttime Astronomy Roadmap 2000 to 2025
2000
2008
2010
2012
2014
2025
Wide Field Surveys
SLOAN • 2MASS
NOAO DEEP-WIDE
Construction
Data Pipelining
Archiving
Data Mining
Survey Telescopes
LARGE APERTURE
WIDE FIELD IMAGING
SPECTROSCOPY
Filled Aperture
GEMINI • KECK
MMT
Adaptive Optics
HET
Construction
Tech.
Dev
SEGMENTED 25-M
SPECTROSCOPIC
TELESCOPE
50 to100-M
DIFFRACTION-LIMITED
and/or 1-KM OIR ARRAY
Interferometry
CHARA • NPOI
LBT • KECK


NSO Roadmap 2000 to 2010
2000
2001
2002
2003
2004
2005
2006
2007
2008
NSO 2010
KPVT
Hilltop
SOLIS
Dunn Solar Telescope
AST
McMath-Pierce Solar Telescope
RISE/PSPT
Evans facility
GONG
GONG+
GONG++
Digital Library