Program Status

Pam Marcum
SOFIA Project Scientist
What is SOFIA?
(Stratospheric Observatory for Infrared Astronomy)

• Joint project of US and Germany
• Flies in the dry stratosphere, above the water-absorbing layer of the Earth’s atmosphere.
• Different science instruments, which collectively span a wide range in wavelength (0.3-1600 μm) and can be updated to incorporate cutting-edge technologies
• Mobility
• Can be continuously maintained to sustain a long lifetime
• Provides hands-on training and in-flight observing experience to future instrumentalists
• SOFIA will have an important role in education and public outreach
SOFIA – The Observatory
SOFIA’S 1st-GENERATION SCIENCE INSTRUMENTS

4 SCIENCE INSTRUMENTS AVAILABLE TO SUPPORT COMMUNITY OBSERVATIONS

FORCAST
Mid-IR Camera

FLITECAM
Near IR Camera Photometer

GREAT
Heterodyne spectrometer

HIPO
Photometer

3 SCIENCE INSTRUMENTS CURRENTLY IN DEVELOPMENT

EXES
Mid-IR Spectrometer

FIFI LS
Integral Field Spectrometer

HAWC+
Bolometer Camera
New SOFIA leadership team members

**NASA HQ:**

*Program Scientist:* Glenn Wahlgren  
*Deputy Program Scientist:* Michael Garcia

**SOFIA Program:**

*Program Manager:* Eddie Zavala  
*Science Project Manager:* Pete Zell  
*USRA/DAOF Project Manager:* William B Latter  
*Science Instrument Development:* Erin Smith  
*Airframe Development/Test Ops:* Tim Krall
2012 – Milestones

• Announcement of 2nd-Generation Science Instrument selections by NASA HQ:
• Announcement of Awarded Cycle 1 Observations by SOFIA SMO Director:
• Telescope Improvements:
  – An upgraded focal plane guide camera
  – Improved pointing capability
• Observatory Improvements:
  – Mirror Coating Facility assembled in the SOFIA hangar
  – Primary, secondary and tertiary mirrors show no degradation.
  – Water vapor monitor now fully functional (needed for calibration and in-flight assessment of weather conditions).
  – Data archiver and acquisition systems to automate on-board data collection
• Aircraft Improvements:
  – Power Distribution System increased power available to science instruments
  – Cockpit/avionics modernization
  – These needed improvements have taken longer than anticipated, but they are now complete
SOFIA Early Science Published

- Special Section in the U.S. publication *Astrophysical Journal*
  - Features FORCAST results from Early Science
  - 8 papers published in the April 2012 issue

- Special Issue of European Journal *Astronomy & Astrophysics*
  - Features GREAT results from Early Science
  - 22 papers published in June 2012

30 papers published in refereed journals from 330 hours of science and engineering flights
2012 – Milestones

• Announcement of 2nd-Generation Science Instrument selections by NASA HQ:
• Announcement of Awarded Cycle 1 Observations by SOFIA SMO Director:
• Telescope Improvements:
  – An upgraded focal plane guide camera
  – Improved pointing capability
• Observatory Improvements:
  – Mirror Coating Facility assembled in the SOFIA hangar
  – Primary, secondary and tertiary mirrors show no degradation.
  – Water vapor monitor now fully functional (needed for calibration and in-flight assessment of weather conditions).
  – Data archiver and acquisition systems to automate on-board data collection
• Aircraft Improvements:
  – Power Distribution System increased power available to science instruments
  – Cockpit/avionics modernization
  – These needed improvements have taken longer than anticipated, but they are now complete
Two investigations were selected, each is an upgrade to HAWC and will make the following contributions:

- A new sensitive, large format detector array (Johannes Staguhn, Johns Hopkins U)
- Added polarimetric capability (Charles Dowell, JPL; PI of combined effort)

HAWC is the Far-Infrared Camera for SOFIA; these upgrades will support investigations of magnetic fields in the interstellar medium via Far IR imaging polarimetry
2012 – Milestones

• Announcement of 2nd-Generation Science Instrument selections by NASA HQ:
• Announcement of Awarded Cycle 1 Observations by SOFIA SMO Director:
• Telescope Improvements:
  – An upgraded focal plane guide camera
  – Improved pointing capability
• Observatory Improvements:
  – Mirror Coating Facility assembled in the SOFIA hangar
  – Primary, secondary and tertiary mirrors show negligible degradation.
  – Water vapor monitor now fully functional (needed for calibration and in-flight assessment of weather conditions).
  – Data archiver and acquisition systems now automate on-board data collection
• Aircraft Improvements:
  – Power Distribution System increased power available to science instruments
  – Cockpit/avionics modernization
  – These needed improvements have taken longer than anticipated, but they are now complete
Upcoming Milestones: One Year Look-Ahead

• **Observatory Performance Test Flights** (early 2013)
• **Science Instrument Commissioning** (GREAT, FORCAST, FLITECAM, HIPO, FLIPO)
• **Cycle 1 Observations** (early 2013)
• **Deployment:**
  – A Southern Hemisphere deployment, originally planned for 2014, is now being planned for July 2013 as part of Cycle 1, in response to Cycle 1 proposal demand.
• **Cycle 2 Call for Proposals** (Spring 2013)
• **Preparation for 3rd-Generation Science Instrument Announcement of Opportunity planned for 2014.**
Program has begun the transition from a development-driven schedule to a **Science-driven schedule** from this point forward.

- Science campaigns will become fixed in time and duration to provide increased schedule stability.
- There will continue to be a considerable Development / Operations overlap during this transition. Observatory development, integration, testing, and SI commissioning will be prioritized to meet science schedule.
- All Cycle 1 Science Instruments are ready for commissioning and science.