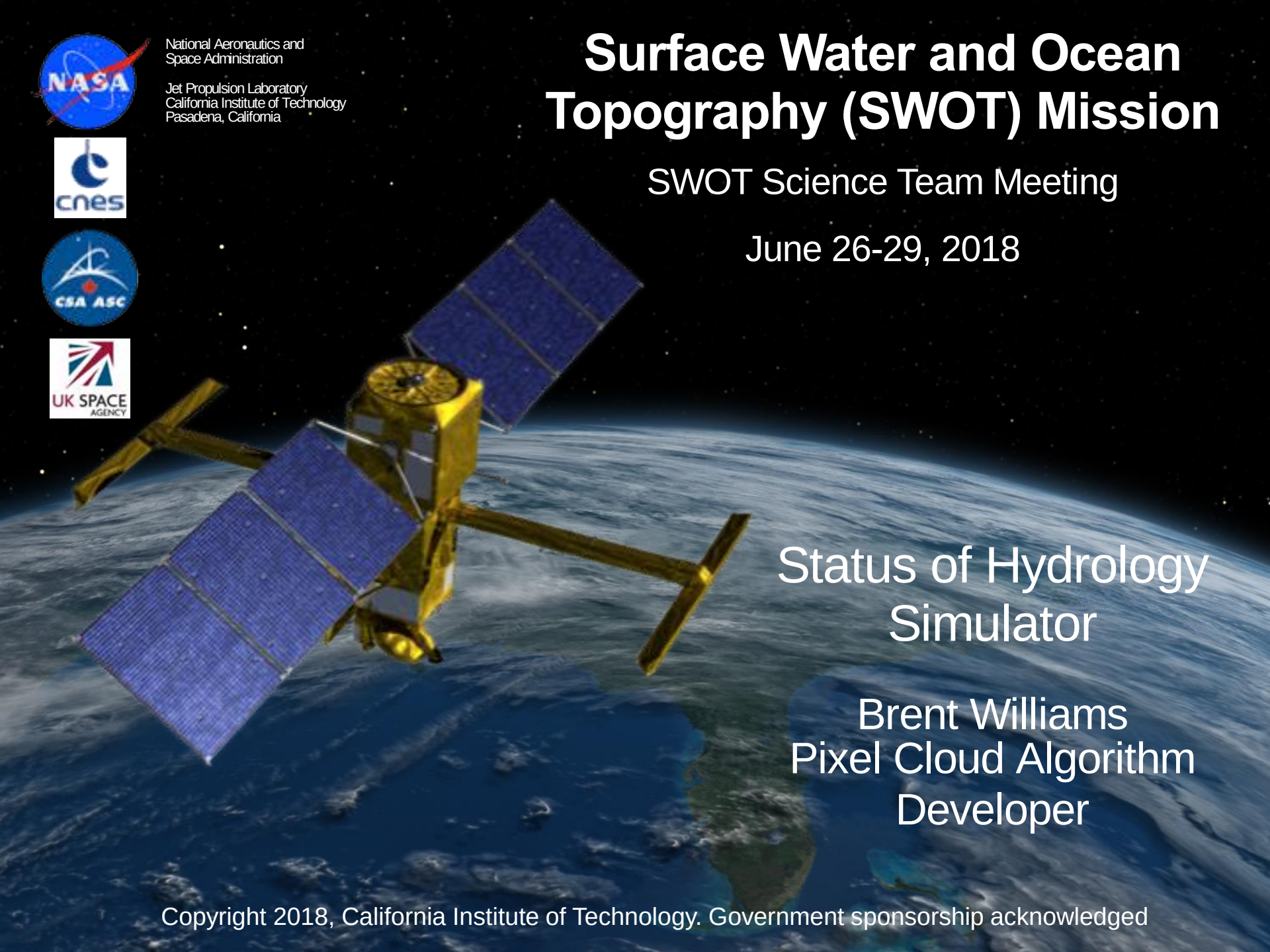


National Aeronautics and Space Administration

Jet Propulsion Laboratory
California Institute of Technology
Pasadena, California

Surface Water and Ocean Topography (SWOT) Mission

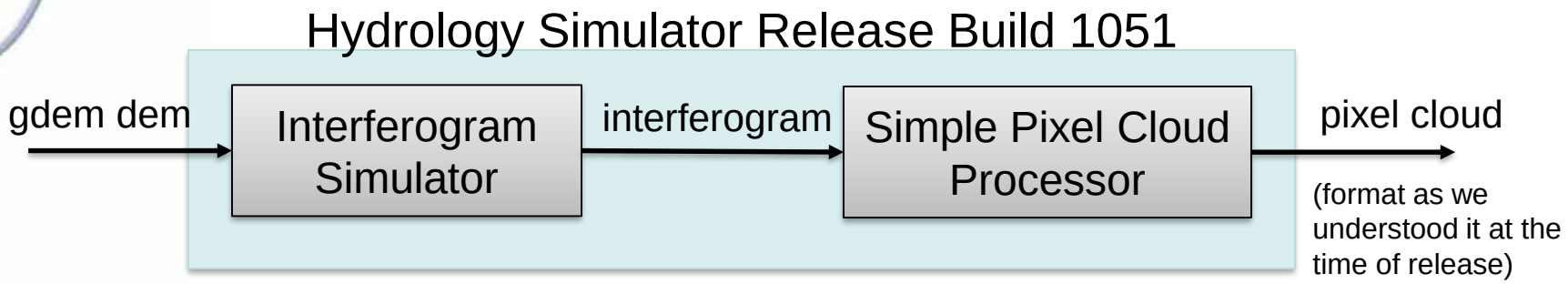
SWOT Science Team Meeting

June 26-29, 2018

Status of Hydrology Simulator

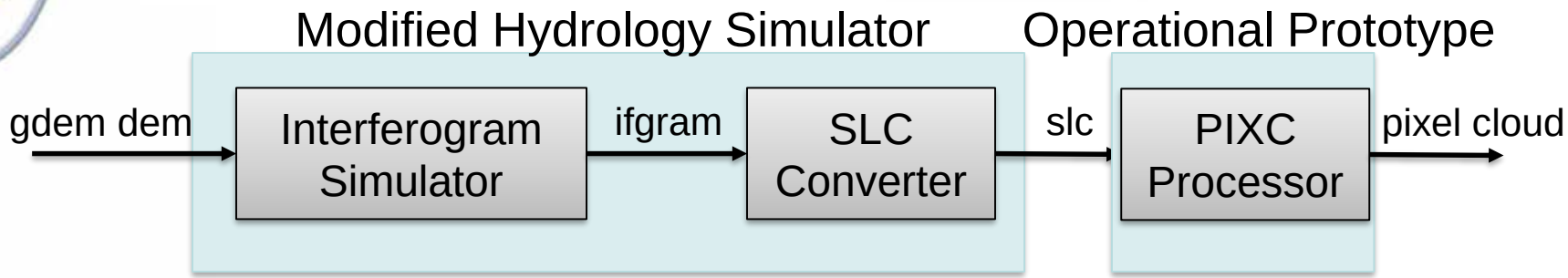
Brent Williams
Pixel Cloud Algorithm Developer

Hydrology Simulator



- **Continues to have sufficient fidelity for science team users.**
  - Primarily used for local studies of surface water.
- Fairly representative of major contributors for phenomenology, measurement, sensitivities, and processing artifacts.
  - Layover
  - Coherence time smearing in azimuth
  - Water sigma0 variations and dark water
  - Simple water detection, dark water flagging, and geolocation
  - Simplified height errors due to attitude, wet/dry troposphere
- Licensed release to interested users as Linux binary executable.
  - Last release: Build 1051, October 2016.
  - **No new releases are expected, except for minor bug fixes.**

SLC Simulator with PIXC prototype



- SWOT project activities have shifted to development and testing of software for operational Science Data System.
- Modified Hydrology Simulator developed to support testing of algorithms in the operational Pixel Cloud (PIXC) processor.
  - Generates simulated Single Look Complex (SLC) products.
  - Operational pixel cloud algorithms assessed with these products (not build 1051).
  - **Ongoing development and maintenance of current best understanding of measurement.**
- **No additional features that significantly impact analyses done by the build 1051 Hydrology Simulator.**

Hydrology (PIXC) Simulators

- Hydrology Simulator (Build 1051)
  - High fidelity
  - Available to science team under license
  - Good for local studies involving details like layover, river slopes, etc.
  - No longer maintained (other than minor bug fixes etc.)
- SLC Simulator with PIXC prototype
  - Very high fidelity
  - Focused on generating simulated SLC products for development and test of operational PIXC algorithms.
  - Applied to project activities (algorithm development and understanding of measurement system phenomenology and algorithm artifacts)
  - Actively developed and maintained
- Pixel Cloud Simulator (aka. large scale simulator, see next talk)
  - Medium fidelity
  - Good for large scale studies or where fine details of measurement, algorithms, and phenomenology are not that important
  - Upcoming availability to whole science team (from CNES)