OCO-2 Status
September 27, 2016

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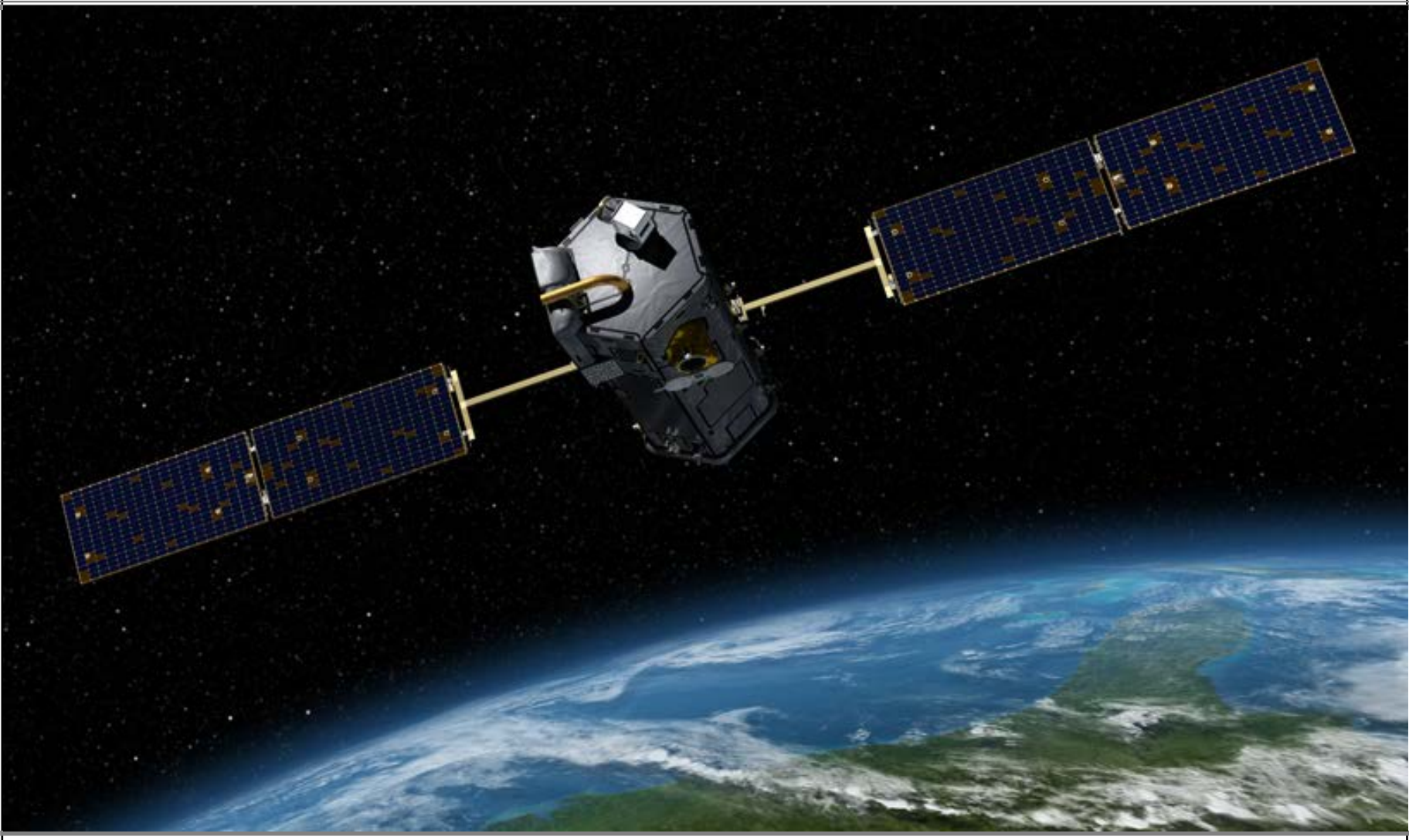
Agenda

- Mission Status
  - Preparing for End of Prime Mission and Senior Review Activities
- Observatory status
  - Instrument anomaly recovery
- Preparation for the 25-27 October Science Team Meeting
  - https://sites.google.com/site/oco2oct2016stm/home
  - Hotel and Transportation Arrangements
  - Plenary
  - Speed Talks
  - Posters
  - Dinner

Instrument Status



Instrument Recovery Status

- At 4:28 UTC on Wednesday 10 August, just after OCO-2 few over Rio de Janeiro, the instrument performed a spontaneous reset and was shut down by the fault detection system (Orbit 11212)
- After completing an anomaly investigation, the instrument was successfully powered on at 16:39 UTC on Sunday 14 August, and commanded to perform a standard 28 C decontamination cycle
- The instrument optical bench and FPAs were back at their operating temperatures and collecting science data on Sunday, 21 August (Orbit 11376)
- Level 2 science data production delayed due to an issue with the on-board calibrator, precluding routine data delivery

BCA Offset - Resolved

- **Observations**

  Solar and lamp calibration observations collected following August 2016 decon had changed slightly

  - **Spectral dependence of calibration data had not changed**
  - **Spatial distribution of illumination had an larger footprint dependence**
  - **Subsequent analysis indicated that the rotation angle of calibrator paddle had changed by a few steps, changing its alignment**

  – **Precluded routine processing of L1B and L2 data**

- **Actions Taken**

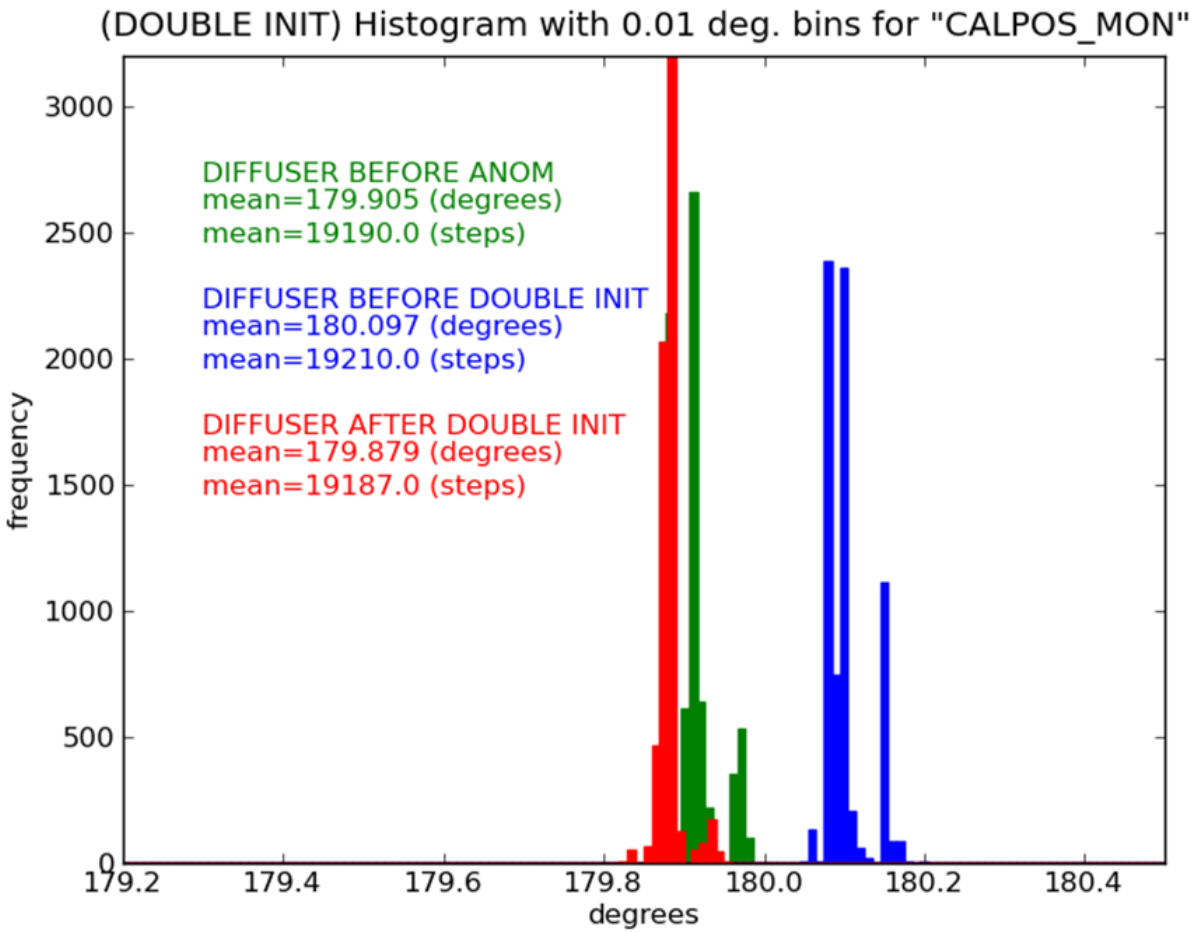
  Nominal science data collection was continued

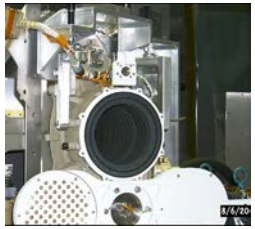
  Processing and delivery of products temporarily suspended

  First Re-initialization of Calibrator did not resolve offset

  Double Initialization of Calibrator returned to nominal position

Thermal Stability Restored: 21 August





Data Production Resumed

- **Message added to the GES DISC**

  The OCO-2 instrument experienced an anomaly that interrupted routine operations at 4:28 UTC on August 10, 2016 (Orbit 11212). The cause of the anomaly was resolved, and the instrument recovery process was initiated on August 14 by conducting a standard, week-long decontamination cycle. The decontamination cycle was completed, and the instrument's optical bench and detectors were at their nominal operating temperatures on 21 August (Orbit 11376). An initial analysis of the data indicated that, while the instrument was working nominally for science observations, its on-board calibration mechanism had not initialized properly, and was out of alignment, precluding the routine production and delivery of calibrated science data products. The calibrator alignment issue was diagnosed and resolved on 20:34 UTC on September 15, 2016. After validating the quality of the data, the standard version 7 (v7) forward streams for L1B and L2 data were reinitiated on September 20, 2016.

  There will be a permanent data gap from August 10 (Orbit 11212) to August 21 (Orbit 11376) because no science observations were collected during that period. The L1B and L2 science data collected between August 21 and September 20, while the calibrator was not aligned properly, will not be processed as part of the forwardv7 data stream, but will be processed as part of the August and September retrospective products (v7r). These data will be processed using a non-standard calibration product. Users should report any issues that they encounter with these data.

OCO-2 Science Team Planning

Draft Agenda October 25

Topic	Discussion Leader	Start Time	duration (min)
Registration and check in		8:15 AM	30
Welcome from NCAR	Jim Hurrell	8:30 AM	10
Welcome from HQ	Ken Jucks	8:40 AM	10
Welcome, Overview, Logistics and Introductions	Dave Crisp	8:50 AM	10
Mission Status	P.J. Guske	9:00 AM	15
SPEED TALKS	ALL	9:15 AM	120
Lunch break	ALL	11:15 AM	75
reconvene		12:30 PM	0
flux team kickoff	Baker	12:30 PM	15
science background	Jacobson	12:45 PM	20
Flux inversion results	Crowell	1:05 PM	45
addressing biases	Schuh	1:50 PM	20
UQ related presentations	UQ team	2:10 PM	50
BREAK	ALL	3:00 PM	30
ACOS discussion/ v7 updates	Chris + others	3:30 PM	60
POSTERS	All	4:30 PM	60
End of Day	ALL	5:30 PM	0

Draft Agenda October 26

Topic	Discussion Leader	Start Time	duration (min)
Registration and check in		8:00 AM	30
Welcome, Overview and Logistics	Dave Crisp	8:30 AM	10
local sources talk 1	speaker 1	8:40 AM	20
local sources talk 2	speaker 2	9:00 AM	20
local sources talk 3	speaker 3	9:20 AM	20
discussion	all	9:40 AM	20
BREAK	ALL	10:00 AM	30
pre-v8 overview	Eldering/O'Dell	10:30 AM	30
timeseries	Fisher	11:00 AM	20
maps	Eldering/O'Dell	11:20 AM	20
biases	Eldering/O'Dell	11:40 AM	20
discussion	Eldering/O'Dell	12:00 PM	30
LUNCH	ALL	12:30 PM	60
flux part 2	Dave Baker	1:30 PM	20
more in flux	others	1:50 PM	75
COFFEE	ALL	3:05 PM	30
SIF part 1	speaker 1	3:35 PM	20
SIF part 2	speaker 2	3:55 PM	20
SIF part 3	speaker 3	4:15 PM	20
POSTER	ALL	4:35 PM	75
End of Day	ALL	5:50 PM	

Draft Agenda October 27

Topic	Discussion Leader	Start Time	duration (min)
Registration and check in		8:00 AM	30
Flux recap = where are we as a mission	Schimel et al	8:30 AM	20
Flux recap - what else do we need regarding the data	Baker et al	8:50 AM	20
Discussion	all	9:10 AM	20
Action item review	Eldering	9:30 AM	15
COFFEE	ALL	9:45 AM	30
paper plans	Eldering et al	10:15 AM	30
senior review - where we are	Crisp and Eldering	10:45 AM	30
senior review - what we need from the team	Crisp and Eldering	11:15 AM	20
End of Meeting		11:35 AM	0
Discussion	ALL	11:35 AM	20

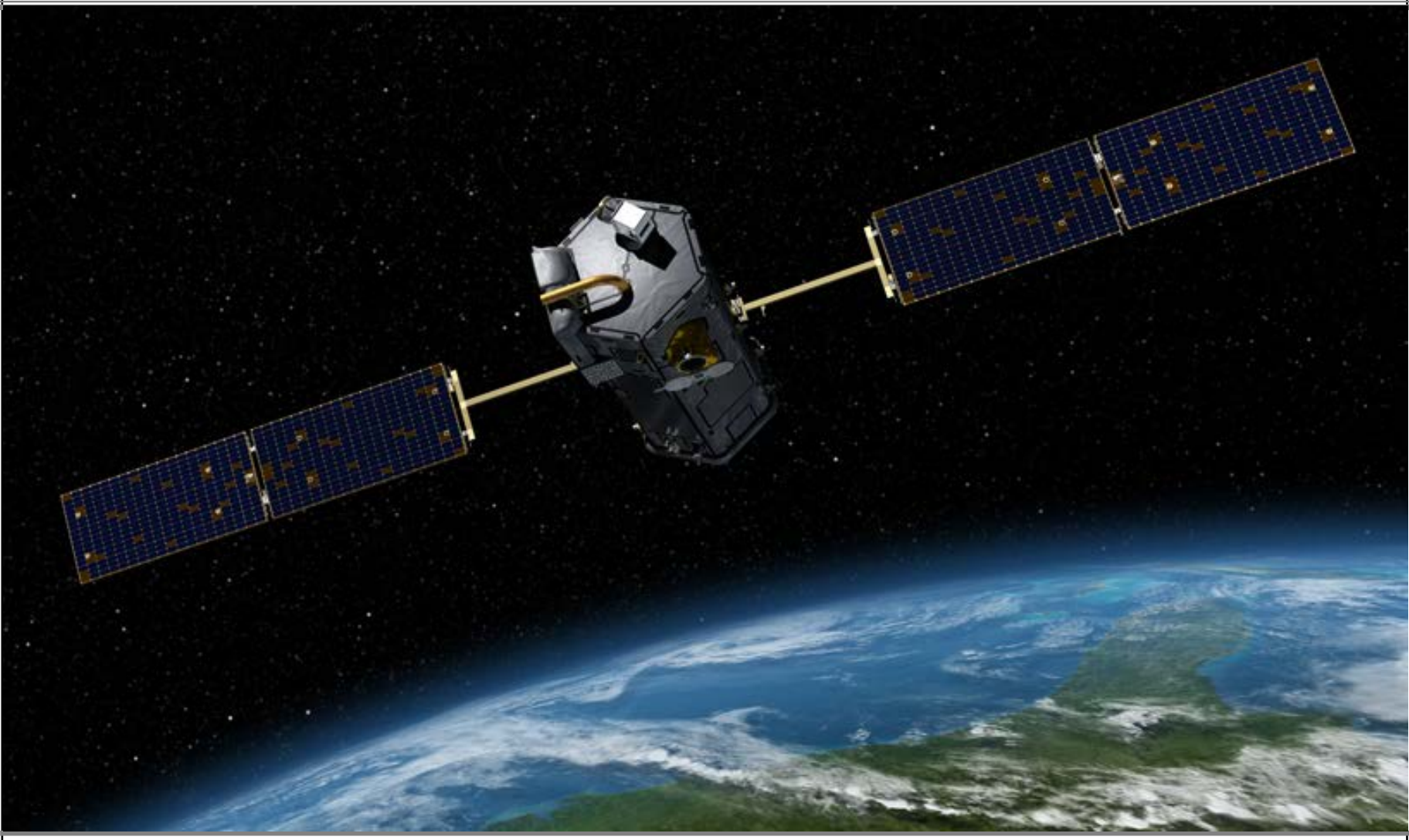
Progress

- If you have not registered, but plan to attend either in person or via WebEx, please register ASAP at

https://sites.google.com/site/oco2oct2016stm/home/registration

- 80 people registered to date
- ~50 people signed up for speed talks -- ~2 hours
- Posters: ~25 identified so far
- Dinner plans announced on Web Site soon

Senior Review



Senior Review Topics (1 of 2)

- As you know, the 2-year prime mission of OCO-2 is coming to an end.
- To extend the mission, we have to participate in the NASA Senior Review process, and write a proposal that highlights
  - the success of the prime mission
  - describes our objectives for the extended mission.
- The instructions for the 2017 Senior Review proposals will be described on Sunday 11 December, and then released officially on Tuesday, 20 December. Proposals are due on March 3, 2017.
- Because this is the first time that OCO-2 mission has been required to go through this process, the OCO-2 Project is writing a strawman Senior Review proposal.
- The deadline for these activities is the first week of November, when this this proposal will be subjected to a mock "Excellence Review" at JPL, which will be conducted during the week of 7-10 November.

Senior Review Topics (2 of 2)

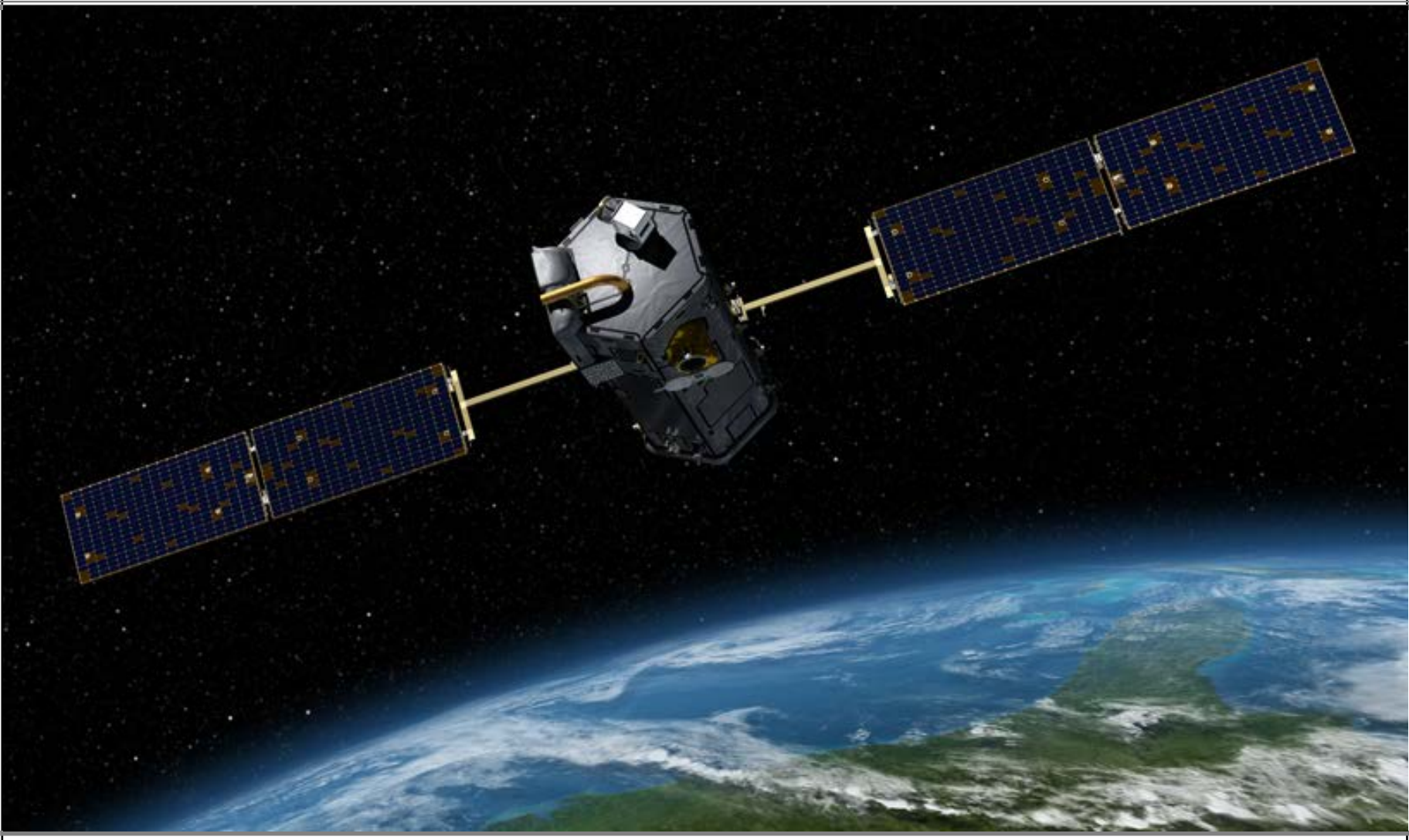
- We are gathering the science results that we want to highlight in the OCO-2 Strawman Senior Review Proposal.

- Each Theme Group (Calibration, ABSCO, Cloud/Aerosol, L2, Flux Inversion, UQ, Validation) will be encouraged to define products (including publications) that illustrates their progress (i.e. their "Greatest Hits")

- Over the next week or so, we will ask the each Theme to provide a brief summary of their progress (an extended abstract and a couple of figures that illustrate your "Greatest Hits") and summary of their future plans.

- We will finalize this process at the Science Team meeting on 25-27 October.

Publications



Papers in Review

- Rosenberg, Rob, et al.: Preflight radiometric calibration of Orbiting Carbon Observatory 2, IEEE Transaction on Geoscience and Remote Sensing
- Lee, Richard , et al.: Preflight spectral calibration of the Orbiting Carbon Observatory 2, IEEE Transaction on Geoscience and Remote Sensing
- Bloom, Anthony, et al.: OCO-2 detection of southern Africa fire CO2 emission
- Hobbs, Jonathan, et al.: Uncertainty quantification for remote sensing retrievals, Journal on Uncertainty Quantification
- Drouin, Brian, et al.: Multispectrum analysis of the Oxygen A-band, Journal Quantitative Spectroscopy and Radiative Transfer
- Bohai Zhang, et al.: Statistical properties of atmospheric greenhouse gas measurements: looking down from space and looking up from the ground, Elsevier Science
- J. Heymann et al.: CO2 emission of Indonesian fires in 2015 estimated from satellite-derived atmospheric CO2 concentrations, GRL
- Hai Nguyen, et al.: Multivariate Spatial Data Fusion for Very Large Remote Sensing Datasets, Remote Sensing
- Nelson, Robert, et al.: High-accuracy measurements of total column water vapor from the Orbiting Carbon Observatory-2, GRL
- Patra, Pabrir et al., Orbiting carbon observatory (OCO-2) tracks 2-3 peta-grams increase of carbon release to the atmosphere during the 2014-2016 El Niño, Nature Scientific Reports

Papers in Preparation

- O'Dell, Chris, et al.: First retrievals of carbon dioxide from the Orbiting Carbon Observatory-2, AMT
- Chatterjee, A., et al.: Influence of El Nino on atmospheric CO2: Findings from the Orbiting Carbon Observatory-2, Science (TBC)
- Frankenberg, Christian, et al.: OCO-2 on-orbit SIF, TBD
- Mandrake, Lukas, et al.: OCO-2 warn levels, TBD
- Schwandner, Florian, et al.: Urban Greenhouse Gas Tomography from Space, Science (TBC)
- Schwandner, Florian, et al.: Space-borne detection of volcanic CO2 plumes with OCO-2, Science or GRL (TBC)
- Liu, Junjie, et al.: CO2 Fluxes from Indonesian Fires
- Massie, Steven, et al.: Observational Evidence of 3D Cloud Effects in OCO2 CO2 Retrievals, AMT
- Schmidt, Sebastian, et al.: Understanding 3D cloud effects in OCO-2 observations using the 3D OCO-2 radiance simulator, AMT
- Crisp, David, et al.: Retrieving Surface pressure from OCO-2, AMT
- Bruegel, Carol, et al.: OCO–2 Vicarious Radiometric Calibration, AMT (TBC)
- Bruegel, Carol, et al.: Validation of the OCO-2 automated calibration facility at Railroad Valley, Nevada, AMT (TBC)