



# Minutes from the OCO-2 / OCO-3 Science Team Telecon

David Crisp, for the OCO-2/OCO-3 Team

Jet Propulsion Laboratory, California Institute of Technology

February 5, 2019



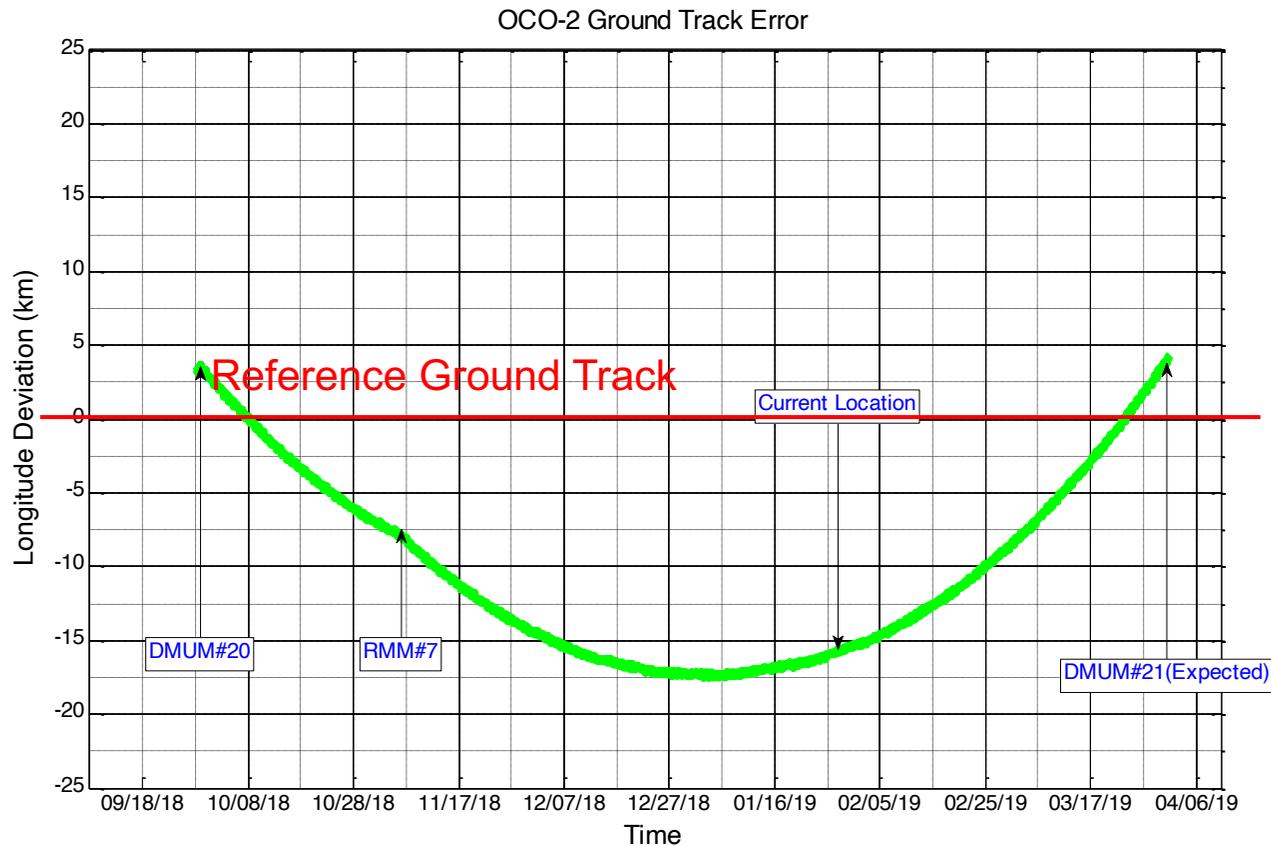
# OCO-2 Status Summary

- Observatory Status: **Nominal**
  - Next Drag Makeup Maneuver (DMM) tentatively scheduled for 21 March 2019 to coincide with a the annual Inclination Angle Maneuver (IAM)
- Instrument Status: **Nominal**
  - Most recent Decon Cycle: 10-17 November 2018
    - Return to science: November 26, restart of Forward stream
- Science Status: **Nominal**
  - “Build 10” testing plan beginning to come together
  - ACOS/GOSAT version 9, slowly coming together
- Today’s Science presentation:
  - Ben Gaubert – Validating global atmospheric CO<sub>2</sub> inverse models against aircraft observations



# OCO-2 Ground Track

East



West

OCO-2 is currently ~15 km west of its reference ground track. The next drag make-up maneuver is scheduled for 28 March, as part of the annual Inclination Adjust Maneuver (IAM)





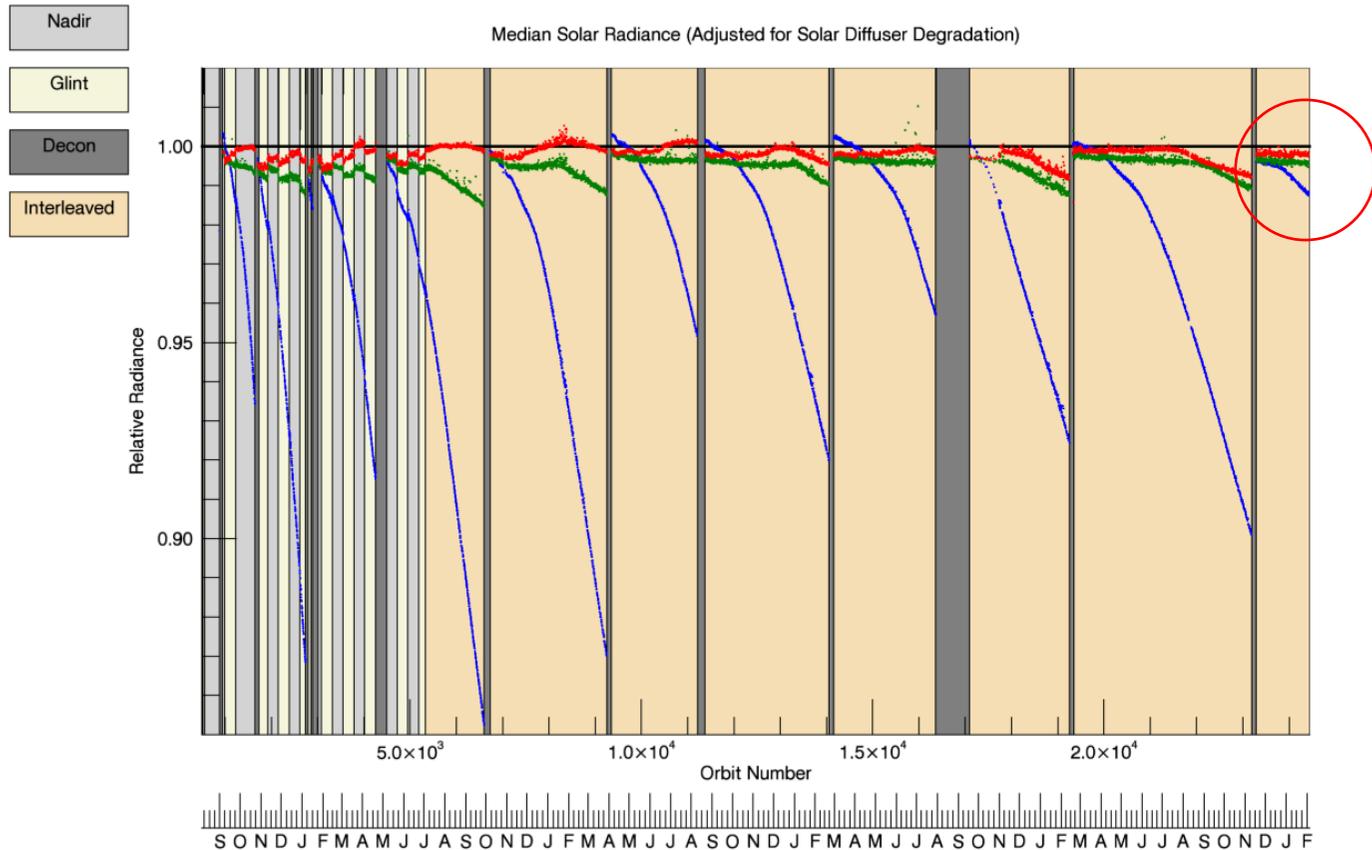
# The Latest TanSat Encounter

- TanSat was deployed in an orbit very similar to OCO-2
  - 700 km altitude, 1:30 PM nodal crossing time
- Every ~4 months, the TanSat and OCO-2 orbits bring them to a closest approach
  - 20 Apr 2017 at 4:20 UTC – range 8.5 km
  - 9 Sep 2017 at 8:32 UTC - range 8.0 km
  - 12 Feb 2018 at 12:16 UTC – range 6.5 km
- The most recent closest approach occurred on 1 February 2018
  - 1 Feb 2019 19:29:25 UTC
    - Radial distance – 0.810 km
    - In-track range – 1.404 km
    - Cross track separation – 0.024 km
- For those interested in comparing OCO-2 and TanSat products, these “opportunities” should provide the most coincident footprints

Most recent closest approach!



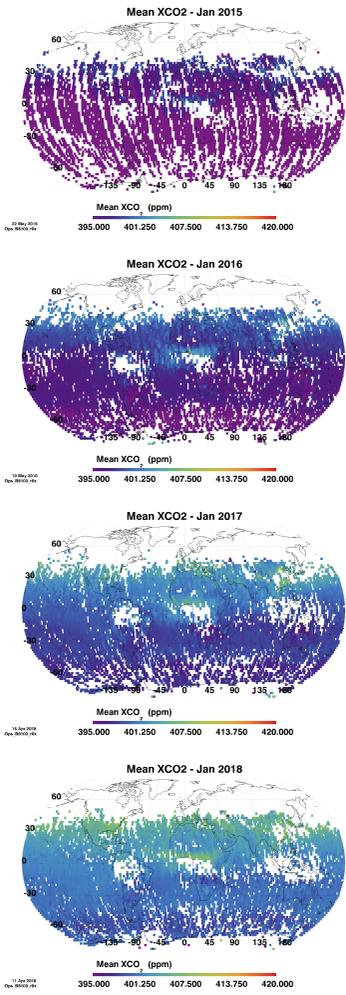
# Throughput Trending



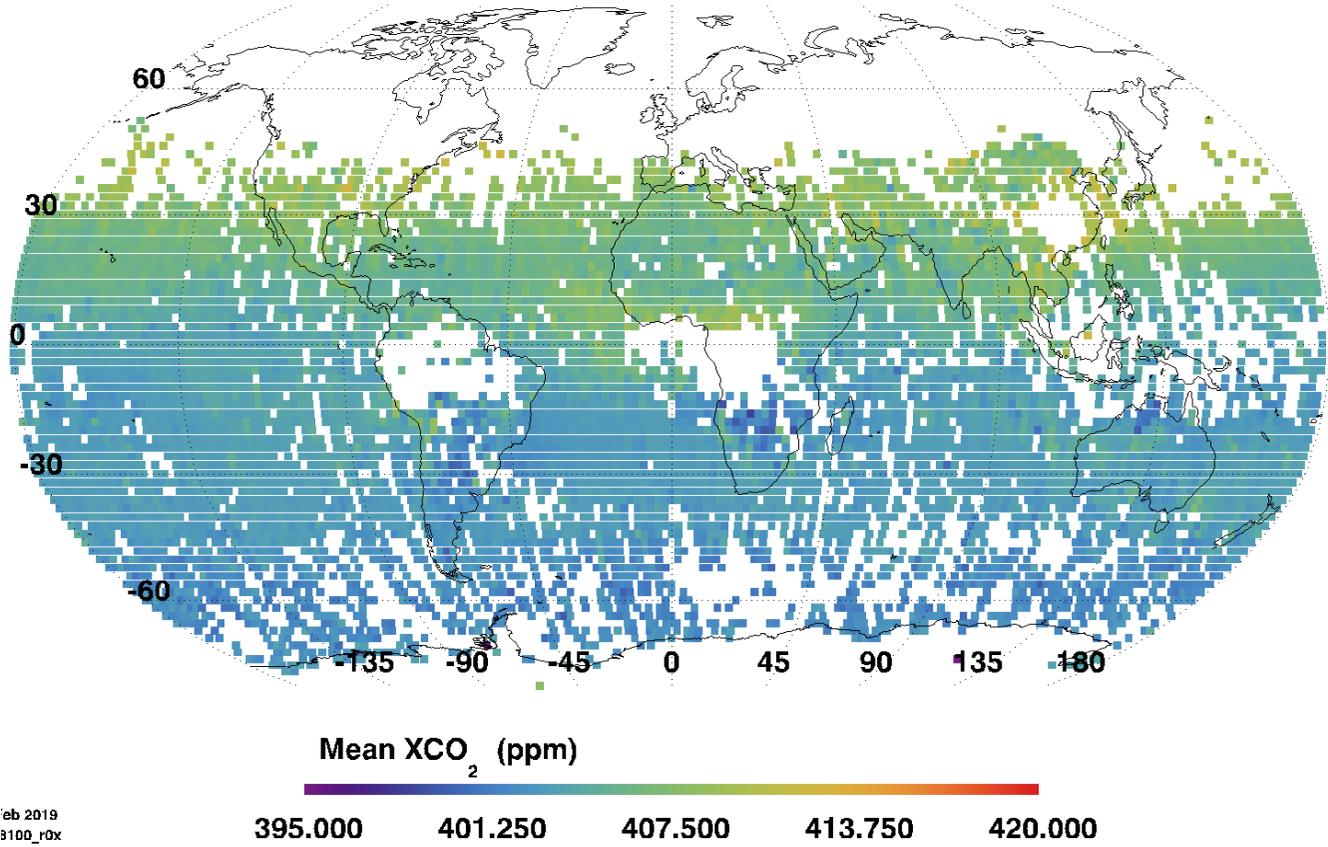
November 2018 Decon restored throughput to > 99% in all 3 channels.  
Next Decon may be delayed until fall.



# L2 V8 Forward Product



## Mean XCO<sub>2</sub> - Jan 2019



The January v8 forward product looks a lot like previous years – with more CO<sub>2</sub>.





# Nominal B10 Testing Plan

- ABSCO update - Ongoing
- Test daily aerosol prior - Ongoing
- Solar model update
- CO<sub>2</sub> prior update (in coordination with TCCON)
- Assess impact of removing surface pressure from retrieved state vector
- Revise SIF calculation in L2
- Examine processes that affect CO<sub>2</sub>\_grad\_del behavior
- Assess value of a CO<sub>2</sub> column (or profile eigenvector) retrieval
- Assess impact of including a non-linear albedo slope
- Investigate including radiance offsets in ABP and in all bands for L2
- Assess convergence criteria and impact of restricting unphysical states
- Include temp profile (or temperature profile eigenvectors) in retrieval
- Assess impact of effort to detect/correct biases due to 3D effects of clouds

High Priority

As Time Allows





# Publication Statistics

**As of Feb 5, 2019**

- 2014: OCO-2: 7 refereed papers, 1 book chapter
- 2015: OCO-2: 8 refereed papers
- 2015: ACOS: 3 refereed papers, 1 book chapter
- 2016: OCO-2: 18 refereed papers
- 2016: ACOS: 12 refereed papers
- 2017: OCO-2: 48 refereed papers
- 2017: ACOS: 2 refereed papers
- 2018: OCO-2: 36 refereed papers
- 2018: ACOS: 4 refereed papers





# Publications in Review

- Crowell, S., Baker, D., Schuh, A., Basu, S., Jacobson, A., Chevallier, F., Liu, J., Deng, F., Feng, L., McKain, K., Chatterjee, A., Miller, J., Stephens, B., Eldering, A., Crisp, D., Schimel, D., Nassar, R., O'Dell, C., Oda, T., Sweeney, C., Palmer, P., and Jones, D.: The 2015-2016 Carbon Cycle As Seen from OCO-2 and the Global In Situ Network. *Atmos. Chem. Phys.*, Submitted January 2019.
- Wuerth, S. M., Fung, I., Anderson, J., and Raeder, K.: A carbon-weather data assimilation system for CO<sub>2</sub>. *J. Geophys. Res. Atmospheres*, Submitted Jan 2019.
- Schuh, A., Jacobson, A. R., Basu, S., Weir, B., Baker, D., Bowman, K., Chevallier, F., Crowell, S., Davis, K., J., Deng, F., Denning, S., Feng, L., Jones, D., Liu, J., and Palmer, P. L.: Quantifying the Impact of Atmospheric Transport Uncertainty on CO<sub>2</sub> Surface Flux Estimates, *Global Biogeochemical Cycles*, in review, 2018
- Kiel, M., O'Dell, C. W., Fisher, B., Eldering, A., Nassar, R., MacDonald, C. G., and Wennberg, P. O.: How bias correction goes wrong: Measurement of XCO<sub>2</sub> affected by erroneous surface pressure estimates, *Atmos. Meas. Tech. Discuss.*, <https://doi.org/10.5194/amt-2018-353>, in review, 2018.
- Nelson, R. R. and O'Dell, C. W.: The Impact of Improved Aerosol Priors on Near-Infrared Measurements of Carbon Dioxide, *Atmos. Meas. Tech. Discuss.*, <https://doi.org/10.5194/amt-2018-366>, in review, 2018.
- Kulawik, S. S., O'Dell, C., Nelson, R. R., and Taylor, T. E.: Validation of OCO-2 error analysis using simulated retrievals, *Atmos. Meas. Tech. Discuss.*, <https://doi.org/10.5194/amt-2018-368>, in review, 2018.
- Eldering, A., Taylor, T. E., O'Dell, C. W., and Pavlick, R.: The OCO-3 mission; measurement objectives and expected performance based on one year of simulated data, *Atmos. Meas. Tech. Discuss.*, <https://doi.org/10.5194/amt-2018-357>, in review, 2018.
- Wang, H., Jiang, F., Wang, J., Ju, W., and Chen, J. M.: Differences of the inverted terrestrial ecosystem carbon flux between using GOSAT and OCO-2 XCO<sub>2</sub> retrievals, *Atmos. Chem. Phys. Discuss.*, <https://doi.org/10.5194/acp-2018-1175>, in review, 2018.



# Call for Contributions to a Special Issue of Remote Sensing on Calibration/Validation of Hyperspectral Imagery



*remote sensing*

*Special Issue*



## Calibration/Validation of Hyperspectral Imagery

### Guest Editors:

**Dr. Aaron Pearlman**

GeoThinkTank LLC / NASA Goddard Space Flight Center Biospheric Sciences Lab

**Dr. Shihyan Lee**

SAIC / NASA Ocean Biological Processing Group

Deadline for manuscript submissions: 30 April 2019

Website: [www.mdpi.com/journal/remotesensing/special\\_issues/calibration\\_validation\\_Hyperimage](http://www.mdpi.com/journal/remotesensing/special_issues/calibration_validation_Hyperimage)

The issue will cover a broad range of areas of the calibration and validation of space-based, aircraft-based, or unmanned aircraft-based hyperspectral sensors used in remote sensing. These topics include but are not limited to the following:

- Pre-launch calibration—radiometric, spectral, spatial
- Post-launch vicarious validation field campaigns
- Hyperspectral imagery artefact identification and mitigation
- Cross-comparison of hyperspectral imagers with other satellite sensors

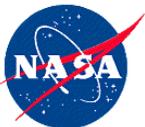


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# Call for Contributions to a Special Issue of Remote Sensing on CO<sub>2</sub> and CH<sub>4</sub>



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## Special Issue

### Remote Sensing of Carbon Dioxide and Methane in Earth's Atmosphere

#### Special Issue Editor:

**Dr. Prabir K. Patra**

Japan Agency for Marine-Earth Science and Technology

**Dr. David Crisp**

Jet Propulsion Laboratory, California Institute of Technology

**Dr. Thomas Lauvaux**

Pennsylvania State University

**Website:** [www.mdpi.com/si/18603](http://www.mdpi.com/si/18603)

**Submission Deadline:** 31 May 2019

Carbon dioxide (CO<sub>2</sub>) and methane (CH<sub>4</sub>) are the two most important greenhouse gases that have led to a significant fraction of the increase in earth's surface temperature in the past 100 years. This Special is dedicated to the past progress and new developments in satellite remote sensing of long-lived greenhouse gases, with a focus on CO and CH<sub>4</sub>.



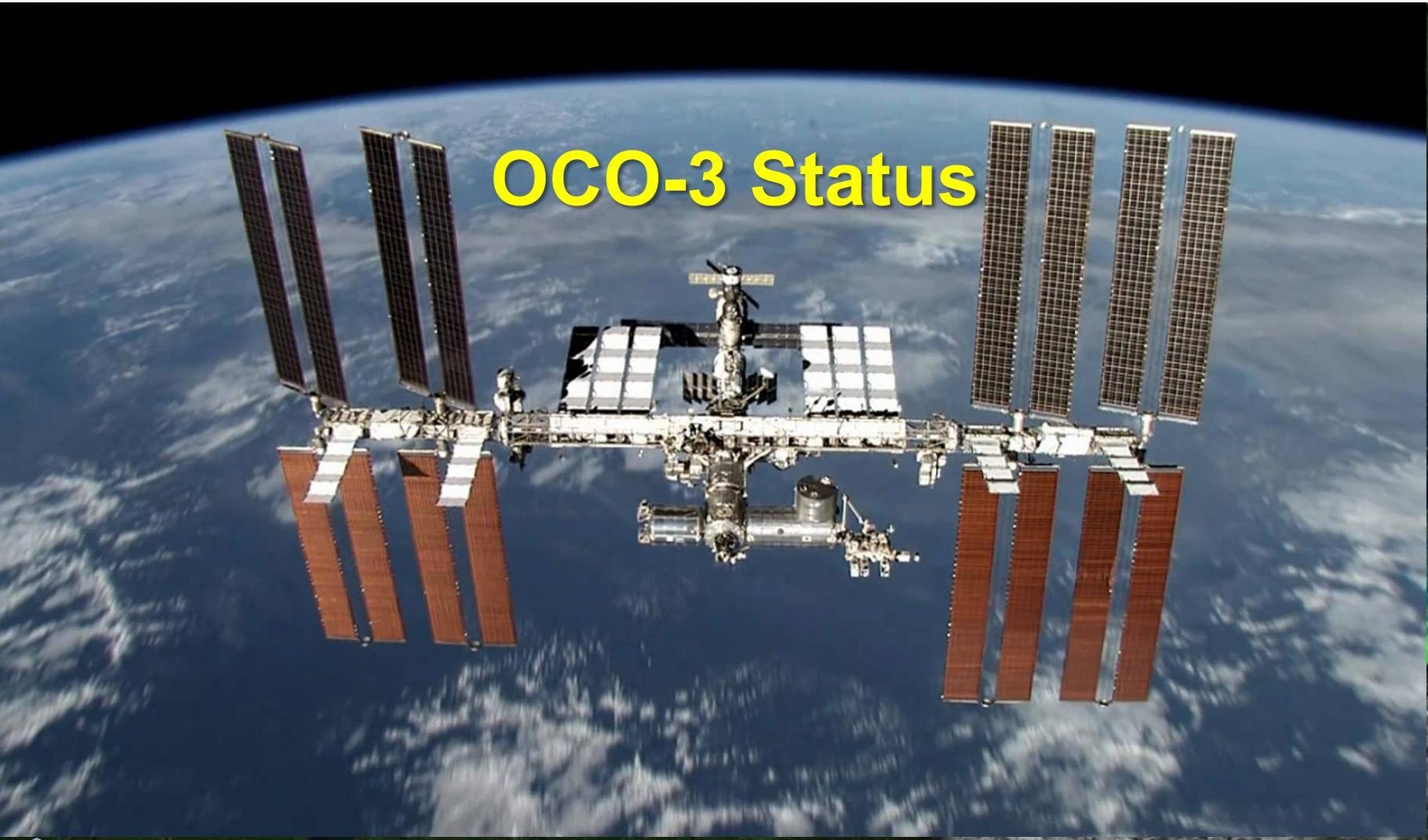
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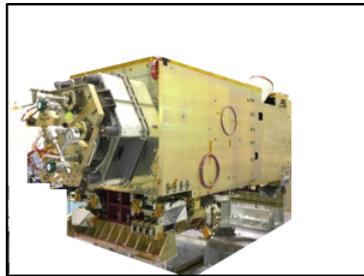
# OCO-3 Status



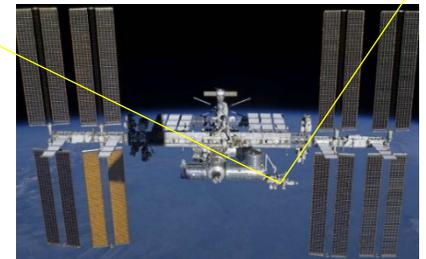
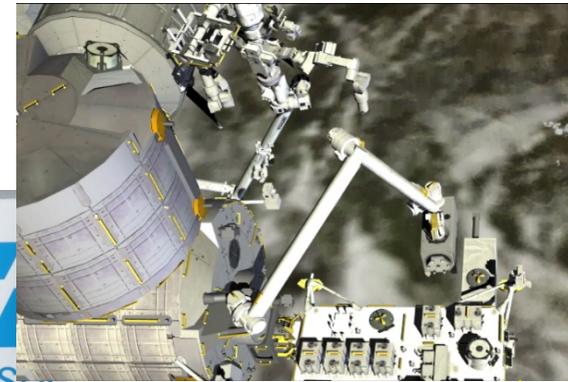


# OCO-3 Status Summary

- OCO-3 is currently in storage at Cape Canaveral
  - February 8 transfer to Dragonland for integration into the Dragon trunk and deployment on the Falcon 9 launch vehicle.
  - Current launch date: **No Earlier than 25 April 2019**
  - We are still planning to hold a Science Team meeting in conjunction with the launch, but this plan may be revised if the launch slips further
  - **More as we know it**

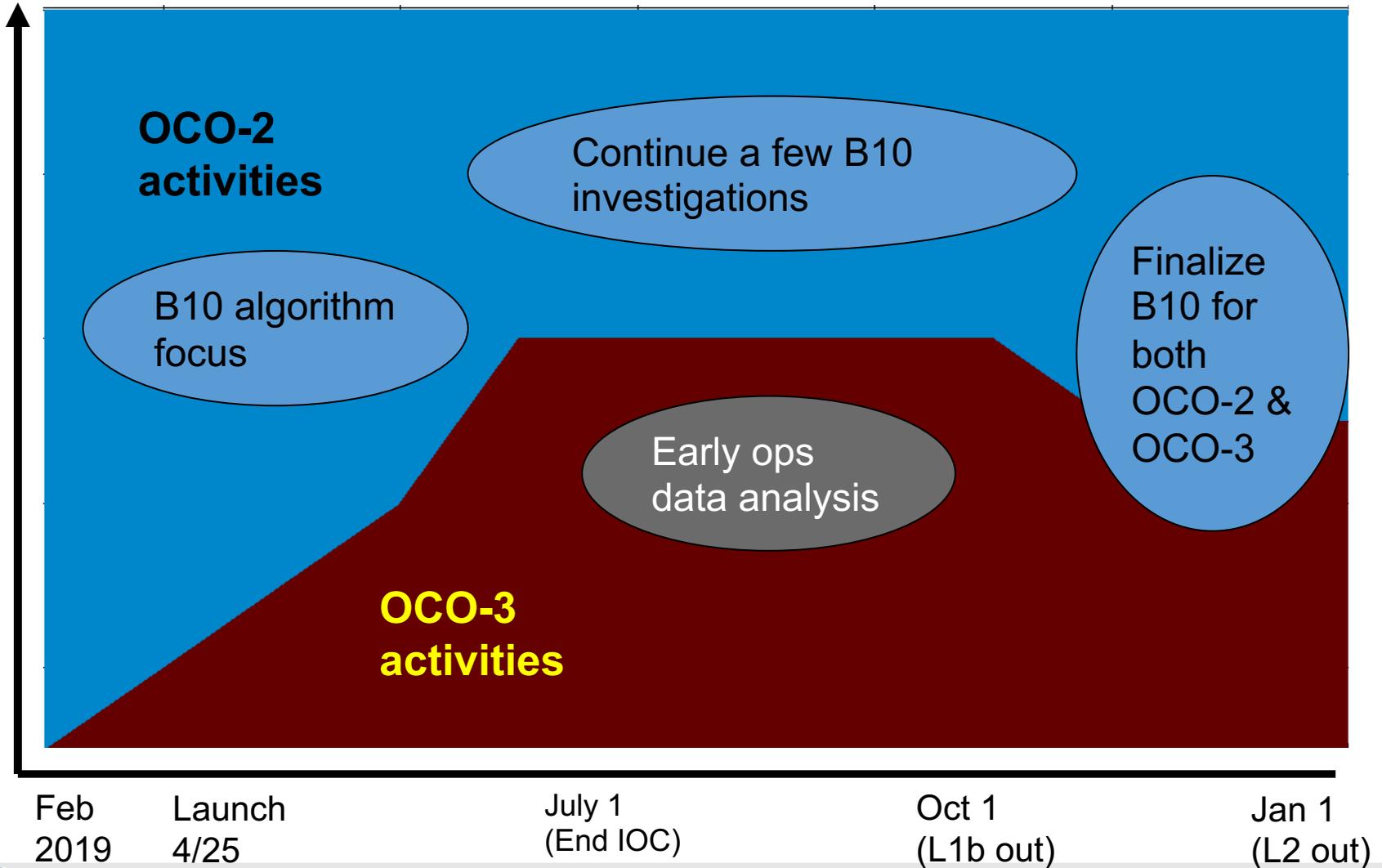


The OCO-3 Team



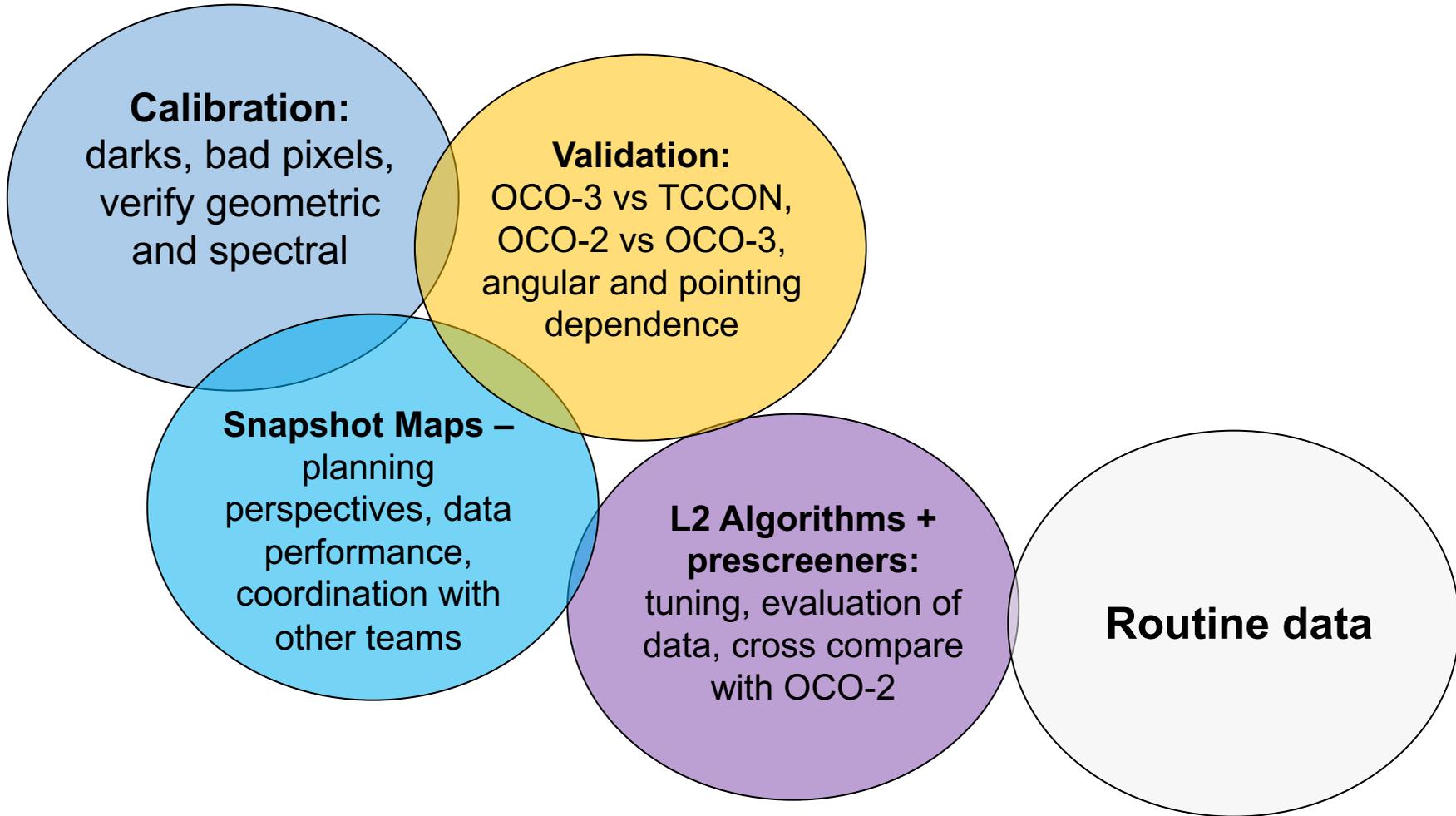


# Integrating OCO-2 and OCO-3 Activities





# Snapshot of Early Ops Activities





# Key Near Term Activities

Blue text indicates items that have been updated since the last report. Red text indicates that there may be a changes.

Planned Date	Activity Description
26-27 Feb	Flux Inversion Mini Meeting, Boulder, CO
11-13 Mar	UQ Breakout meeting, Pasadena, CA
25 Apr	OCO-3 Launch, Cape Canaveral, FL
24-26 Apr	OCO-2/OCO-3 Spring Science Team Meeting, Coco Beach, FL
7-12 Apr	EGU General Assembly, Vienna
13-17 May	ESA Living Planet Symposium, Milan, Italy
21-22 May	NOAA ESRL GMD Annual Conference, Boulder
3-5 Jun	IWGGMS-15, Sapporo, Hokkaido, Japan
17-20 Jun	CALCON - Characterization and Radiometric Calibration for Remote Sensing, Logan Utah
30 Jun-5 Jul	2019 RRV Campaign
7-18 Jul	27th IUGG General Assembly 8-18 July, Montreal, Canada
26-29 Aug 2019	Chapman Conference: Carbon-Climate Feedbacks, San Diego





# IWGGMS-15 Sapporo, Hokkaido, Japan

IWGGMS-15, (M-W) June 3-5, 2019, Sapporo, Hokkaido, Japan

- NIES posted a webpage for the meeting here:

<https://www.nies.go.jp/soc/en/events/iwggms15/>

This page includes the following deadlines:

- **Workshop Dates:** June 3 (Mon) - June 5 (Wed), 2019
- **Abstract submission:** January 22 (Tue) - April 1 (Mon), 2019
- **Registration:** January 22 (Tue) - April 26 (Fri), 2019 (**those who need visa to enter Japan should register** before March 28, 2019)
  
- **Associated Meetings:**
  - GOSAT RA PI meeting (closed meeting for GOSAT PI's) will be held on Thursday 6 June at the same venue
    - See <https://www.nies.go.jp/soc/en/ra/meeting01/>
  - CEOS AC-VC Annual Meeting – held in Tokyo (or Tsukuba) on 10-12 June. Additional information in prep.

