

# NASA's PACE mission launches in January 2024 and will provide data relevant to the air quality community



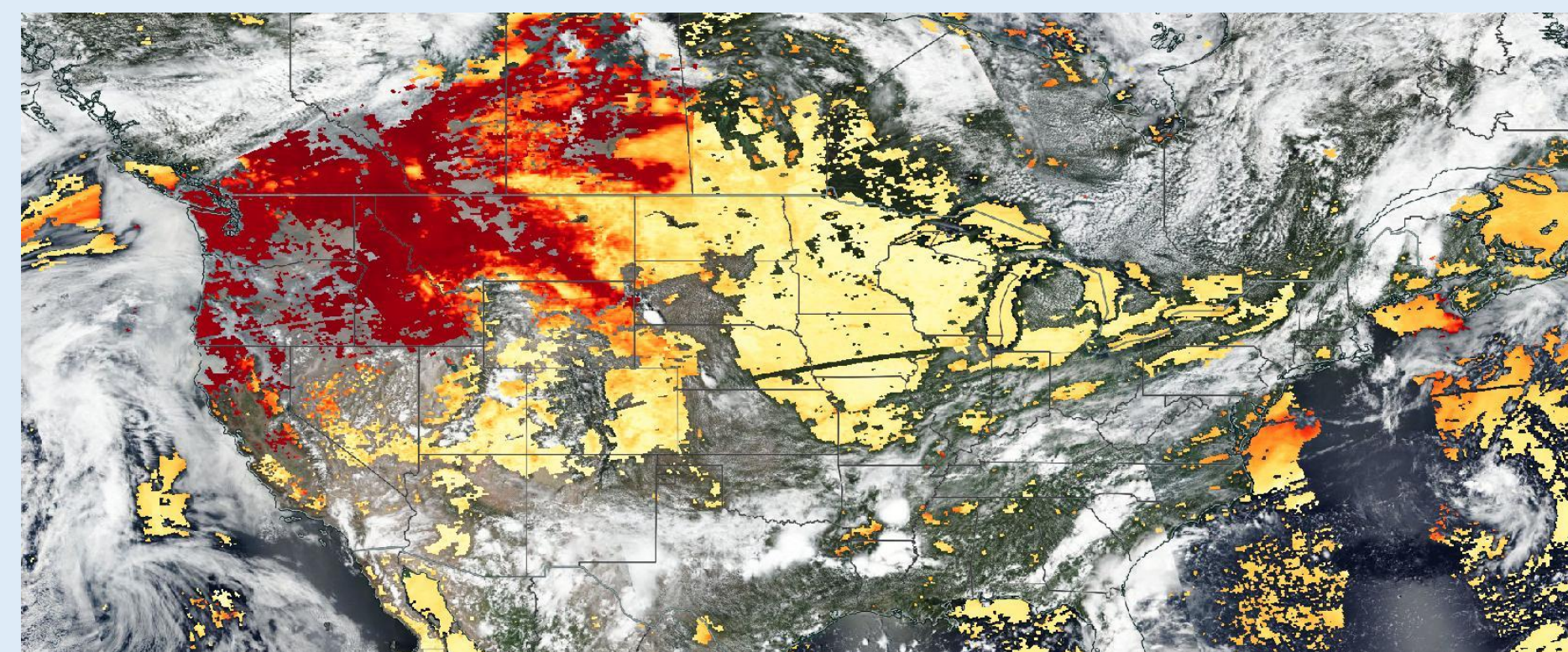
Andrew M. Sayer<sup>1,2</sup> ([andrew.sayer@nasa.gov](mailto:andrew.sayer@nasa.gov)), Kirk D. Knobelspiesse<sup>2</sup>, Natasha Sadoff<sup>2,3</sup>, Erin Urquhart<sup>2,3</sup>

1: GESTAR II, University of Maryland Baltimore County, MD, USA 2: Ocean Ecology Laboratory, NASA Goddard Space Flight Center, Greenbelt, MD USA 3: SSAI, Lanham, MD, USA

The **Plankton, Aerosol, Cloud, ocean Ecosystem (PACE)** mission will extend and improve NASA's global satellite observations in its eponymous domains. Here we focus on aerosol products related to **air quality**. PACE's hyperspectral Ocean Color Instrument (OCI) will offer **daily near-global spatial coverage** with a 1.2 km horizontal pixel size at the sub-satellite point. PACE will also have two multi-angle polarimeters (HARP2 and SPEXone) capable of advanced atmospheric characterization. The satellite will fly in a Sun-synchronous orbit with a daytime local solar Equatorial crossing time of 13:00. It will **launch in January 2024** with a design life of 3 years and 10 years of propellant. Data will be freely available in NetCDF format with an **expected latency of less than 1 day** for OCI.

## What can OCI do for me?

At-launch aerosol products will include implementations of the MODIS/VIIRS Deep Blue and Dark Target algorithms, providing **aerosol optical depth (AOD)** and **Ångström exponent (AE)** at OCI's native spatial resolution. If you are familiar with those products, using PACE OCI data should be easy.



VIIRS Deep Blue AOD at 550 nm from Aug 14, 2021. Colors indicate values from ~0 (yellow) to >5 (deep red); typical values are <0.3. Intense smoke from fires in the western USA and Canada blanketed much of both countries and eventually crossed coast to coast. Image from NASA Worldview, <https://worldview.earthdata.nasa.gov>

After launch we are expecting advanced data products to include **single scattering albedo (SSA)** and **aerosol layer height**. These should assist air quality applications compared to MODIS/VIIRS heritage, by improving knowledge of aerosol type and whether or not they are near Earth's surface.

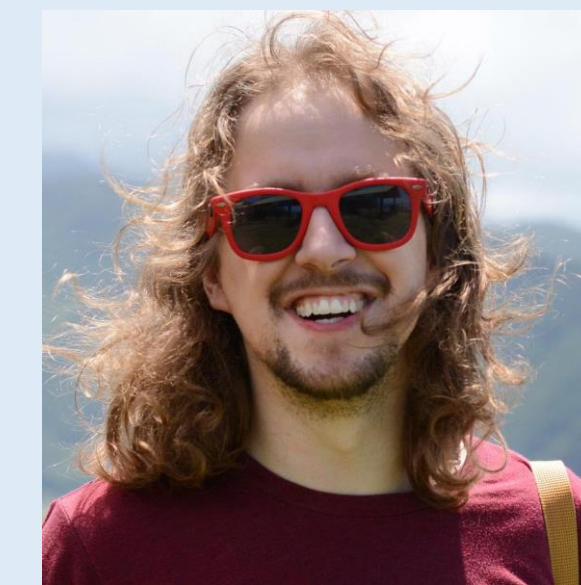
## What can the polarimeters do for me?

PACE's multiangle polarimeters offer increased information content meaning more aerosol parameters can be retrieved and fewer assumptions about aerosol and surface properties need to be made. Polarimeter data products will be provided on a 5.2 km grid. Several algorithms are currently being implemented and expected to produce data after launch, including:

What?	Why is it useful?
Aerosol optical depth	Relates to the total amount of aerosol in the atmospheric column
Ångström exponent	Informs on relative abundance of fine and coarse aerosol particles
Size distribution and fine-mode fraction	Indicative of aerosol composition
Spectral complex aerosol refractive index and single scattering albedo	Provides aerosol absorption, related to composition
Fraction of spherical particles in the coarse mode	Indicative of likely presence of dust or volcanic ash
Aerosol layer height	Indicative of whether aerosols are likely to affect surface air quality

## I'm interested – how can I get involved?

### You can contact any of us



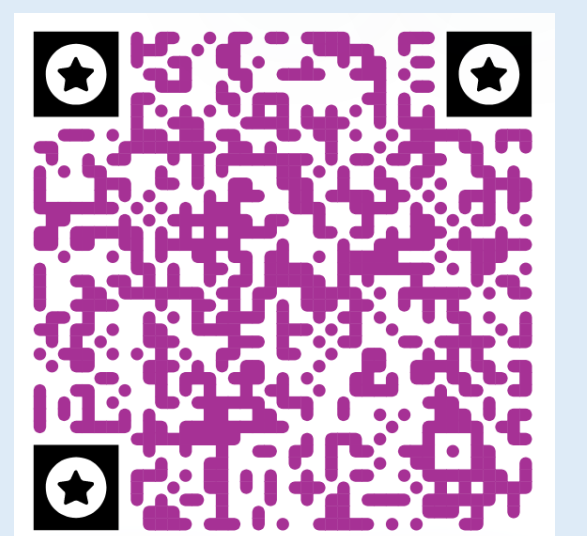
Andrew Sayer  
Science Lead for Atmospheres (OCI)  
[andrew.sayer@nasa.gov](mailto:andrew.sayer@nasa.gov)



Kirk Knobelspiesse  
Science Lead for Polarimetry  
[kirk.d.knobelspiesse@nasa.gov](mailto:kirk.d.knobelspiesse@nasa.gov)

Andy and Kirk are well-placed to answer technical questions about the capabilities of instruments and algorithms, data formats, and validation. Prior to launch, we can assist you with proxy data to get you used to PACE file formats.

Erin and Natasha are your points of contact for PACE applications and applied science. They facilitate the Early Adopters program and lead the Community of Practice. Read more below!



**JOIN US!**



Erin Urquhart  
Applications Coordinator  
[erin.urquhart.jephson@nasa.gov](mailto:erin.urquhart.jephson@nasa.gov)



Natasha Sadoff  
Applications Deputy Coordinator  
[natasha.sadoff@nasa.gov](mailto:natasha.sadoff@nasa.gov)

## Join the Community of Practice and come to our events

- Early Adopter Program & Community of Practice**  
 Working with researchers and decision-makers to promote applied science and applications research designed to scale and integrate PACE data into policy, business, and management activities that benefit society and inform decision making
- Community-specific Focus Sessions and Surveys**  
 Engaging with members of the science community through community focus sessions, surveys, & assessments and incorporating feedback into PACE activities
- Annual Application Workshops**  
 Facilitating annual applications workshops to share PACE mission updates, identify and explore end user needs, identify new partnerships and applications, and foster community engagement and discussion

Learn more at <https://pace.gsfc.nasa.gov> !