SUrface Dust Analyzer (SUDA)

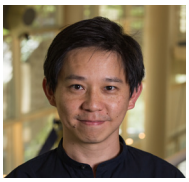
Laboratory for Atmospheric and Space Physics
University of Colorado **Boulder**

SUDA will be a key part of Europa Clipper's quest. The instrument will collect particles ejected from the surface of Europa by tiny meteorite impacts. SUDA is so precise that it can determine what those particles are made of, including whether they contain organic molecules or salts, and where on the surface of the moon they came from. If a subsurface ocean or reservoir is venting material into space as plumes, SUDA will analyze it to help determine if Europa's water is suitable for some form of life.

SUDA subject matter experts available for interviews

Sascha Kempf
Principal Investigator

Scott Tucker
Project Manager

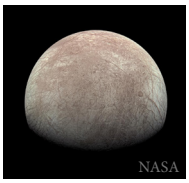


Hsiang-Wen (Sean) Hsu
Deputy Principal Investigator

Sally Haselschwardt
Engineer

Melanie Fisher
Lead Thermal Engineer

Alexandra (Alex) Curtin
Calibration & Testing Lead



Victoria (Vickie) Scarffe-Barrett
Flight Director

Noteworthy dates

- **May 2015:** SUDA selected as an instrument for NASA's Europa Clipper mission
- **Sept. 2022:** LASP engineers completed pre-flight environmental testing and shipped the instrument to the Jet Propulsion Laboratory (JPL) in Pasadena, CA
- **Dec. 2022:** SUDA electronics integrated onto the Europa Clipper spacecraft at JPL
- **May 2023:** SUDA's sensor had was integrated onto the spacecraft at JPL
- **Oct. 10, 2024:** Europa Clipper scheduled to launch from Kennedy Space Center, FL
- **April 2027:** SUDA's door will open and measurements will begin
- **April 2030:** Jupiter orbit insertion
- **2031:** First flyby of Europa

SUrface Dust Analyzer (SUDA)

Laboratory for Atmospheric and Space Physics
University of Colorado **Boulder**

SUDA highlights

Novel engineering
SUDA consists of two parts: the sensor head and an electronics box that will be located in Europa Clipper's aluminum "vault" to shield the sensitive electronics from the radiation surrounding Jupiter and its moons.

Cloud of dust
SUDA will measure the speed, direction, and composition of particles floating in a cloud of dust that encircles Europa.

Plumes
If Europa Clipper finds evidence of plumes erupting from liquid pockets in Europa's subsurface or its interior ocean, SUDA will be used to study the particles in the plumes.

Organic molecules
SUDA is designed to detect tiny amounts of salts, fatty acids, and amino acids and to determine whether they're abiotic or biologic in origin.

Pure gold
The instrument is plated with an extremely thin (2 micron) layer of 99.99% pure gold—a much higher grade than jewelry—to seal off potential contaminants that could come from its metal structure.

Hardest substance
LASP and JILA, another CU Boulder institute, co-developed a method to coat SUDA's target with iridium, the hardest known metal.

By the numbers

35 pounds
SUDA's weight

120°C
The temperature that SUDA's target can be heated to during flight to remove potential contaminants

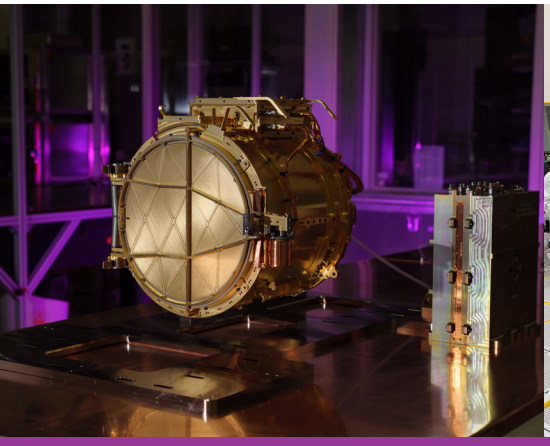
115°C
The temperature at which SUDA components are "baked" to kill microbes to satisfy NASA planetary protection standards

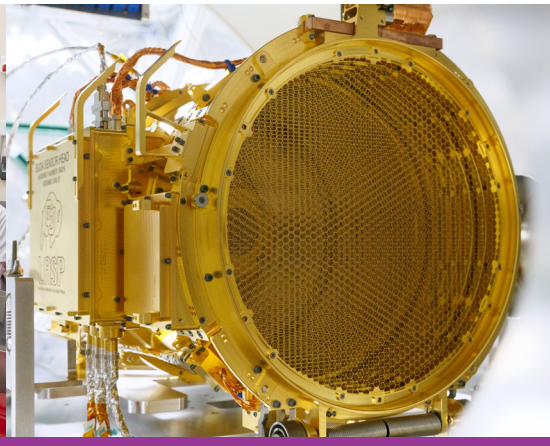
CU Boulder impacts – aerospace

CU Boulder is the #1 recipient of NASA research awards to public universities.

Ralphie: Because SUDA was designed and built at LASP, Ralphie—the CU Boulder buffalo mascot—is engraved onto the instrument's sensor head.

Institutes: CU Boulder hosts 12 research institutes, of which LASP (the Laboratory for Atmospheric and Space Physics) is the oldest and largest in terms of research dollars.





Media contacts:
Terri Cook, terri.cook@lasp.colorado.edu, +1 (303) 817-0443
Sara Pratt, sara.pratt@lasp.colorado.edu, +1 (303) 735-6614
Willow Reed, willow.reed@lasp.colorado.edu, +1 (303) 888-9044