

## LeoLabs Collision Avoidance

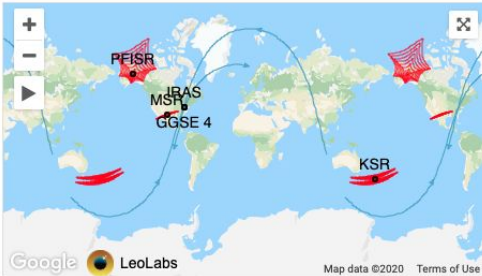
*Empowering satellite operators with advanced tools for safety of flight*

LeoLabs, the world's leading supplier of commercial tracking services for low Earth orbit (LEO), now offers tailored services for operational safety of flight. Built on the LeoLabs data platform, LeoLabs *Collision Avoidance* empowers satellite owner-operators with an entire commercial radar network and robust web analytics tools for enhanced conjunction event monitoring and risk analysis. By utilizing LeoLabs Collision Avoidance, users have access to the most advanced set of tools and data available to understand event risk and inform operational decisions.

### Conjunction Analysis Report

IRAS and GGSE 4 at 2020-01-29 23:39:35 UTC Download as PDF

|                |       |                |        |
|----------------|-------|----------------|--------|
| Object 1       | IRAS  | Object 2       | GGSE 4 |
| Catalog Number | L4668 | Catalog Number | L12679 |
| NORAD ID       | 13777 | NORAD ID       | 2828   |



Map data ©2020 Terms of Use

LeoLabs

View Conjunction View CDM Evolution

|                           |  |
|---------------------------|--|
| Time of Closest Approach  | 2020-01-29 23:39:35.696000 UTC<br>(3 months ago) |
| Miss Distance             | 0.037 km   |
| Screening Distance        | 100.0 km   |
| Collision Probability     | 9.8e-3   |
| Combined Hard Body Radius | 5.0 m  |
| Relative Speed            | 14.672 km/s                                      |
| CDMs Generated            | 69 (IRAS: 30, GGSE 4: 40)                        |
| Last Updated              | 2020-01-30 21:40:49 UTC                          |

LeoLabs Collision Avoidance consists of multiple unique web services and capabilities that together provide a turnkey system for conjunction analysis and risk reduction. All services are 100% cloud-based, with no local software to install. Services include:

**Streaming Conjunctions** - Real-time, continuous delivery of Conjunction Data Messages (CDMs) and dynamic analytics on conjunction events using LeoLabs tracking data and operator-provided definitive ephemerides.

**On-Demand Ephemeris Screening** - Screen candidate ephemerides against the full LeoLabs object catalog to search for potential conjunctions, with results returned automatically in less than 30 seconds.

**Enhanced Secondary Object Support** - Automated prioritization on LeoLabs radars, to increase observation collections on secondary objects in high-risk conjunction events and delivery of high accuracy state vectors with covariances.

**External CDM Integration** - Link your CDMs from the 18th Space Control Squadron (18 SPCS) with the LeoLabs data platform, with event matching and consolidated risk reporting using multiple independent data sources.

**Web Dashboards** - Tailored web tools for operators and analysts, including conjunction analysis reports with interactive data plots and visualizations for key event risk and trending metrics.

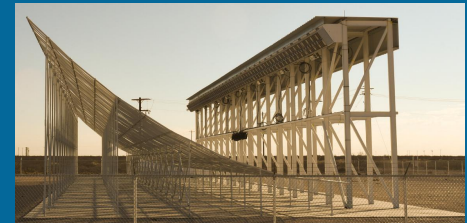
## The LeoLabs Global Radar Network

LeoLabs owns and operates a growing network of ground-based, phased array radars to track objects in LEO. We are building a network that will provide:

- Six radars located strategically around the world for optimal tracking coverage
- Ability to reliably track objects down to 2cm in size
- A total predicted LEO catalog of 250,000+ objects with revisit rates of 10+ times per day for prioritized objects



Poker Flat Incoherent Scatter Radar (Alaska)

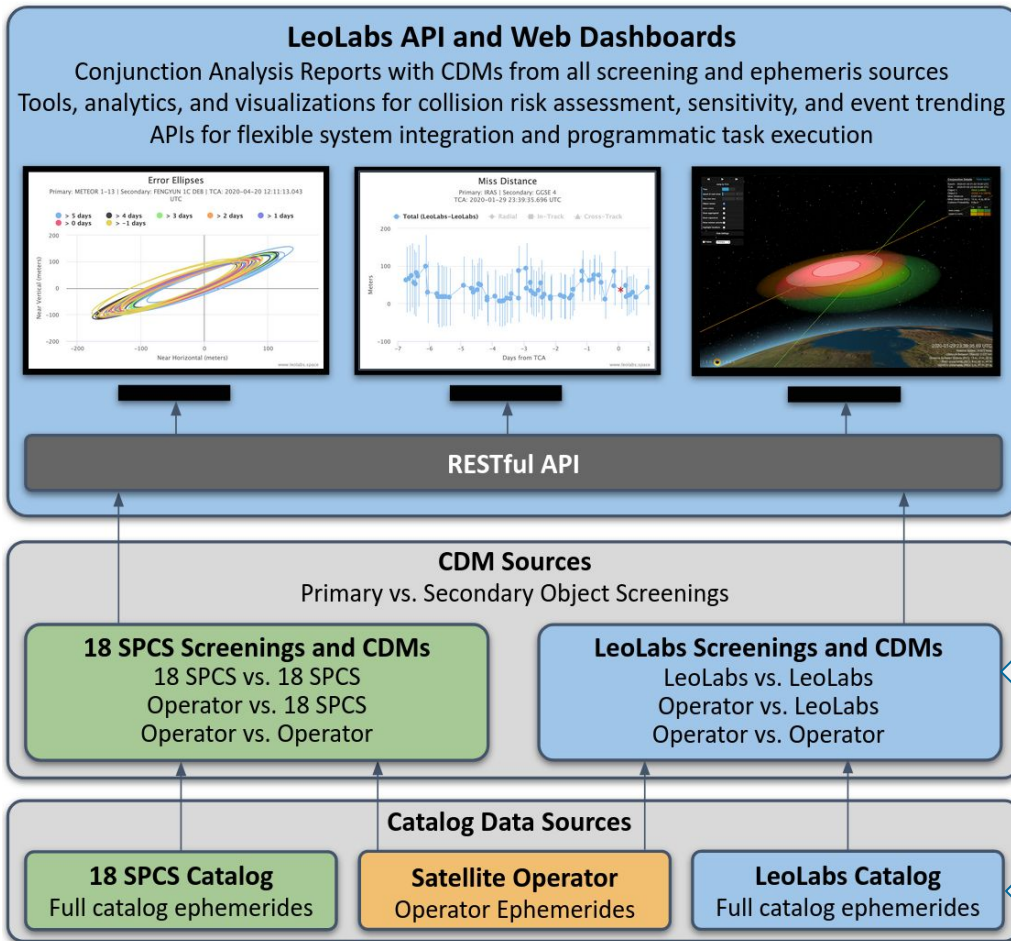


Midland Space Radar (Texas)



Kiwi Space Radar (New Zealand)

# Multi-Source Data Aggregation for Enhanced Conjunction Assessment



LeoLabs Collision Avoidance consists of three unique areas of capabilities, shown in blue in the diagram to the left:

**LeoLabs RESTful API and web dashboards** - tools providing operators and analysts with real-time access to the latest data for conjunction risk assessment, incorporating CDMs from all available sources of ephemerides and conjunction screenings - LeoLabs, operator, and 18 SPCS.

**The LeoLabs conjunction screening system** - continuous all vs. all screening of LeoLabs and operator ephemerides with rapid CDM generation and delivery.

**The LeoLabs object catalog** - 14,000+ objects and growing; including automated radar tracking, orbit determination, state vector and ephemeris generation with full covariances on all objects.

LeoLabs Collision Avoidance functions as a stand-alone system for conjunction event alerting and risk analysis, or as an augmentation to existing systems already in use. Operational teams will have these benefits and more:

**Streamlined satellite operations** - with task automation, including instantaneous ephemeris screenings and auto-tasking for secondary objects in high risk conjunction events.

**More data, when it matters** - Receive up to 400% more frequent conjunction event updates, to make maneuver decisions earlier and with higher confidence.

**Full data access** - Receive high accuracy state vectors and ephemerides with full covariance matrices on secondary objects in all conjunction events.

**Transparency** - Know when to expect the next event updates, with transparent schedule information on next radar passes and tracking confidence predictions.

**Consolidated Support** - a single end-to-end service providing both additional catalog data and analytics tools for conjunction risk assessment; no need to build, buy or maintain separate analysis software.

Ready to get started? LeoLabs Collision Avoidance can be activated immediately upon request, providing you instant access to valuable orbit products. Licensing models are available for single satellites, growing fleets and large constellations. Contact us today to learn more and request an evaluation:

<https://platform.leolabs.space/register>