

AstroLog: Astrophotography Field Catalog Agent

The AstroLog Agent is a powerful multi-agent system designed to automatically generate professional, data-rich log files for your astrophotography sessions. It uses a **Sequential Agent** pipeline to orchestrate web research, data compilation, image processing, and final PDF report generation.

Quick Start in Google Colab

The easiest way to run this project is directly in your Google Colab account.

Prerequisites

1. **Google Account:** You must be signed into a Google account.
2. **API Key:** A valid **Gemini API Key** is required to power the agents.

Step 1: Open the Notebook

1. Open the main project file: `Astrophotography_Field_Catalog_Agent.ipynb`
2. (Optional) Save a copy to your Google Drive.

Step 2: Setup and Configuration

In the Colab notebook, follow the cells sequentially:

1. **Run Cell 1: Install Dependencies**
 - o Execute the first code cell to install the necessary libraries (google-adk, fpdf, pillow).
2. **Run Cell 2: Configure API Key**
 - o Enter your **Gemini API Key** when prompted. The notebook securely configures the environment.

Step 3: Running the Agent

The final cells handle file upload and agent execution.

1. **Upload Sample Image**
 - o Execute the file upload cell.
 - o **Upload a sample image** (e.g., from the sample_images folder) or use your own image.
2. **Set Agent Parameters**
 - o In the final execution cell, ensure the target_name (e.g., "Whirlpool Galaxy (M51)") and image_filename variables match your input.
3. **Execute the Agent Pipeline**
 - o Run the final code cell. The multi-agent pipeline will execute the sequential flow (Location, Research, Record) and generate the report.

Step 4: Check Output

A new file named AstroLog_[Target Name].pdf (e.g., AstroLog_Whirlpool_Galaxy.pdf) will be generated and available for download in your Colab file browser. See sample output in the sample_astrolog directory for reference.

Architecture & Implementation

The solution is built on a robust multi-agent architecture, demonstrating several key concepts from the ADK:

Agent Architecture: Sequential Pipeline

The system uses a **Sequential Multi-Agent System** where agents execute in a strict, ordered flow, passing data via shared state management.

Stage	Agent Name	Function
1. 	LocationAgent	Retrieves geo-location and weather data using Google Search .
2. 	ResearchAgent	Retrieves scientific facts about the target using Google Search .
3. 	AstroRecordAgent	Compiles all data and calls the Custom Tool for PDF creation.

Process: User Input -> **LocationAgent** -> **ResearchAgent** -> **AstroRecordAgent** -> **Final Catalog PDF**

Key Concepts Demonstrated

- **Sequential Agents:** Orchestrates the multi-step log creation process.
- **Custom Tools:** Integrates the process_astro_log function for image processing and final PDF generation.
- **Built-in Tools:** Uses **Google Search** extensively for data retrieval (weather, astronomical facts).
- **State Management:** Passes compiled data reliably between agents in the pipeline.
- **Effective Use of Gemini:** All sub-agents are powered by Gemini 2.5 Flash Lite for intelligent tool-use and instruction execution.