Exoplanets and Claude Code

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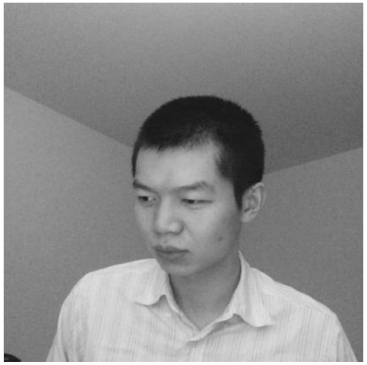
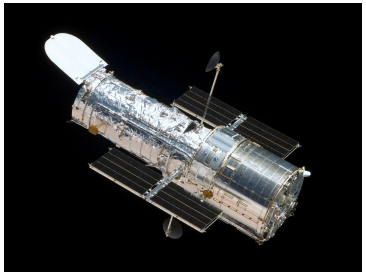
Space Telescope Science Institute (STScI)
Database Support & Engineering

Data Engineering D.C. Meetup
Wed. Aug. 27, 2025 @ 6:00 PM EDT

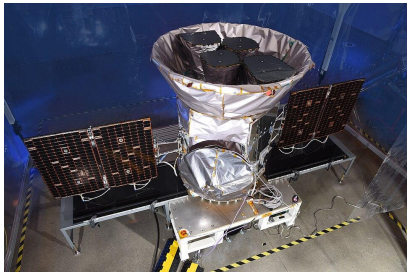
About

STScI | SPACE TELESCOPE SCIENCE INSTITUTE





Hubble Space Telescope (HST)



Transiting Exoplanet Survey Satellite (TESS)

My background is in:

- *Science/Engineering* and *Business*

I've worked in:

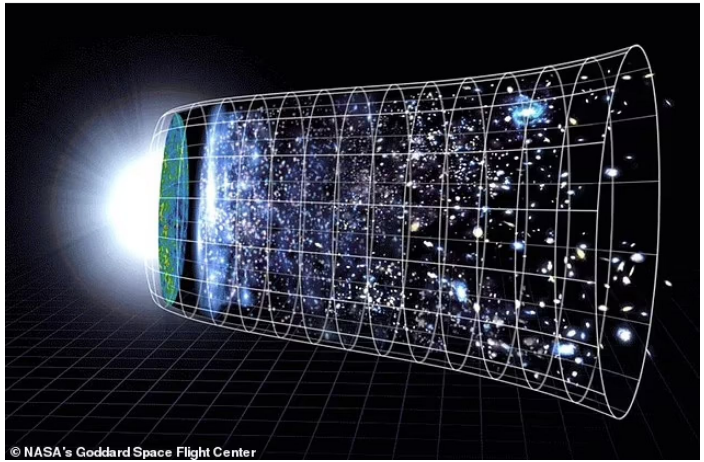
- *Academia, Government, Private Industry*

AGENDA

I'll go over the **science** and **Claude Code**; then I'll do a *data engineering* demo.

SCIENCE!

Astronomy in 30 Seconds

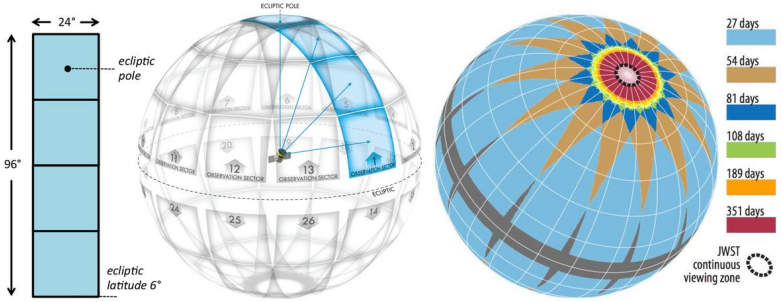


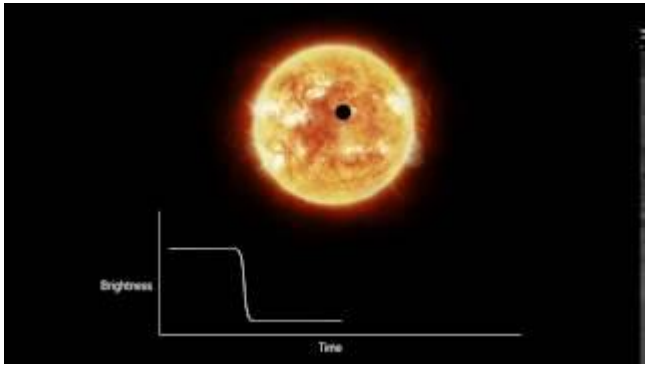
The Universe

- 5% baryonic/visible matter
- 27% dark matter
- 68% dark energy

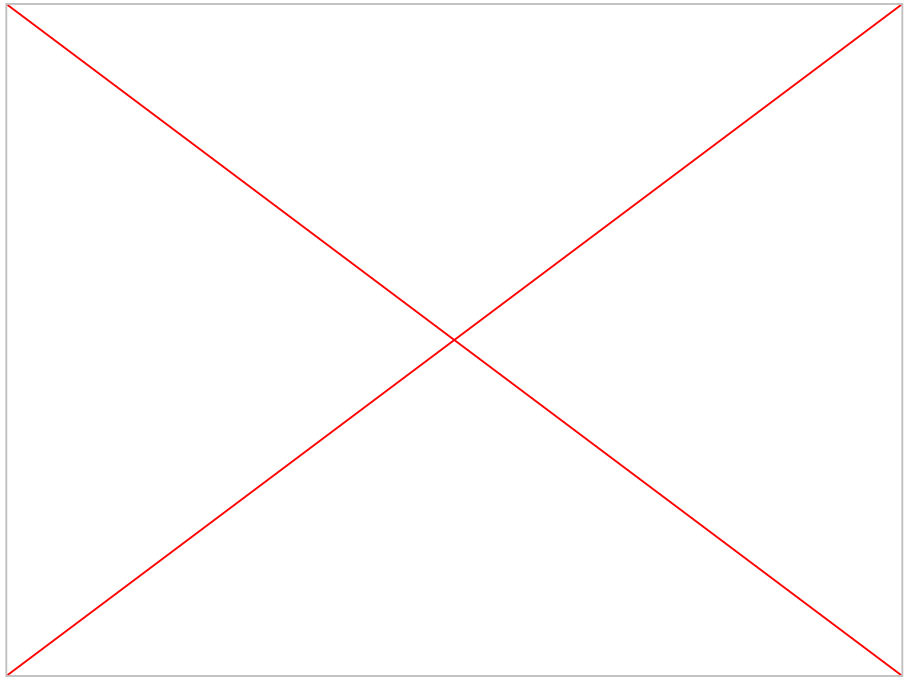
TESS and Exoplanet Hunting!

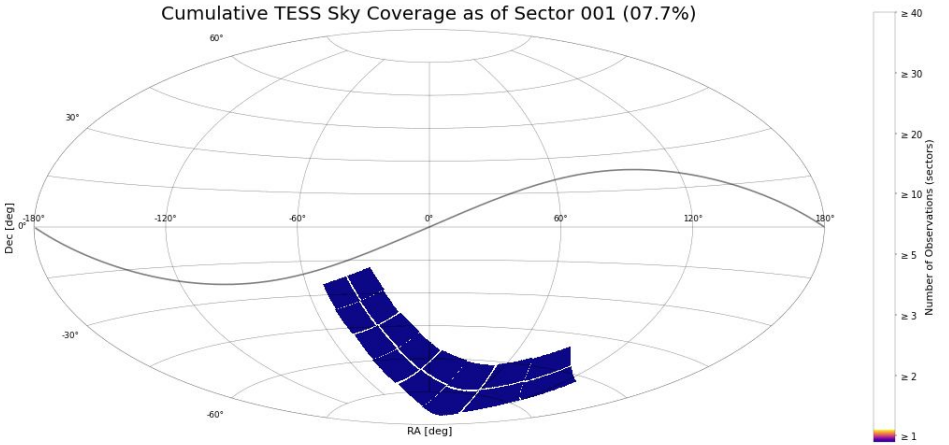
- TESS uses the **transit method** to look for **exoplanets** - planets outside of our solar system. Launched on *4/18/18*.
- TESS has four cameras that each survey a 24° square area of the sky. Together, they form a 24° x 96° **observation sector**.
- TESS surveys each observation sector for **27 days**.
- As of *Sat. 8/23/25*, TESS has found **7,668** candidate exoplanets, of which **686** are confirmed.





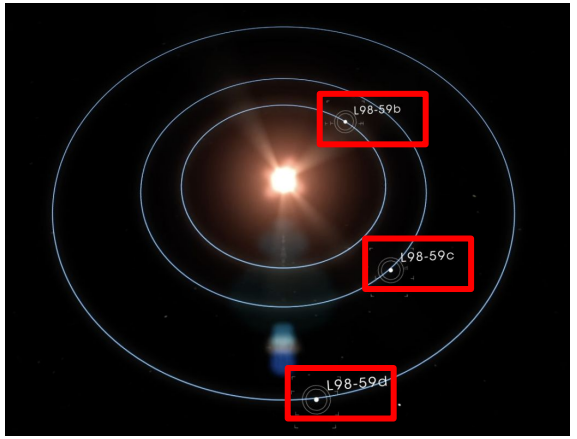
TESS Sky Coverage

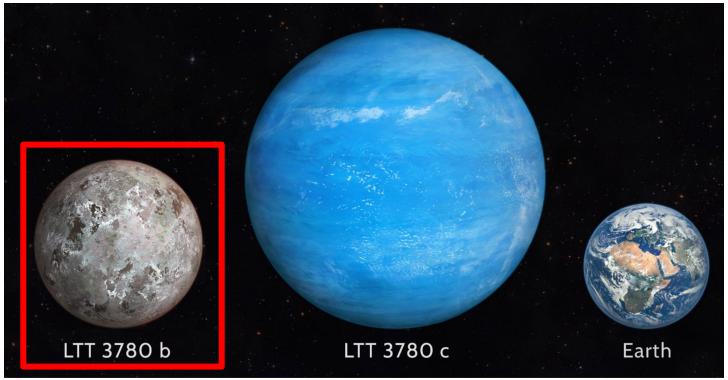




TESS: Planetary Systems with Earth-Sized Planets

"A **planetary system** consists of a set of *non-stellar bodies* which are *gravitationally bound* to and in orbit of a **star** or **star system**." - Wikipedia





Claude Code!

Anthropic Academy

Anthropic courses

AI Fluency: Framework & Foundations
Learn to collaborate with AI systems effectively, efficiently, ethically, and safely

AI Fluency for educators
This course empowers faculty, instructional designers, and educational leaders to apply AI Fluency into their own teaching practice and institutional strategy.

AI Fluency for students
This course empowers students to develop AI Fluency skills that enhance learning, career planning, and academic success through responsible AI collaboration.

Claude with the Anthropic API
This comprehensive course covers the full spectrum of working with Anthropic models using the Anthropic API

Claude Code in Action
Integrate Claude Code into your development workflow

Introduction to Model Context Protocol
Learn to build Model Context Protocol servers and clients from scratch using Python. Master MCP's three core primitives—tools, resources, and prompts—to connect Claude with external services

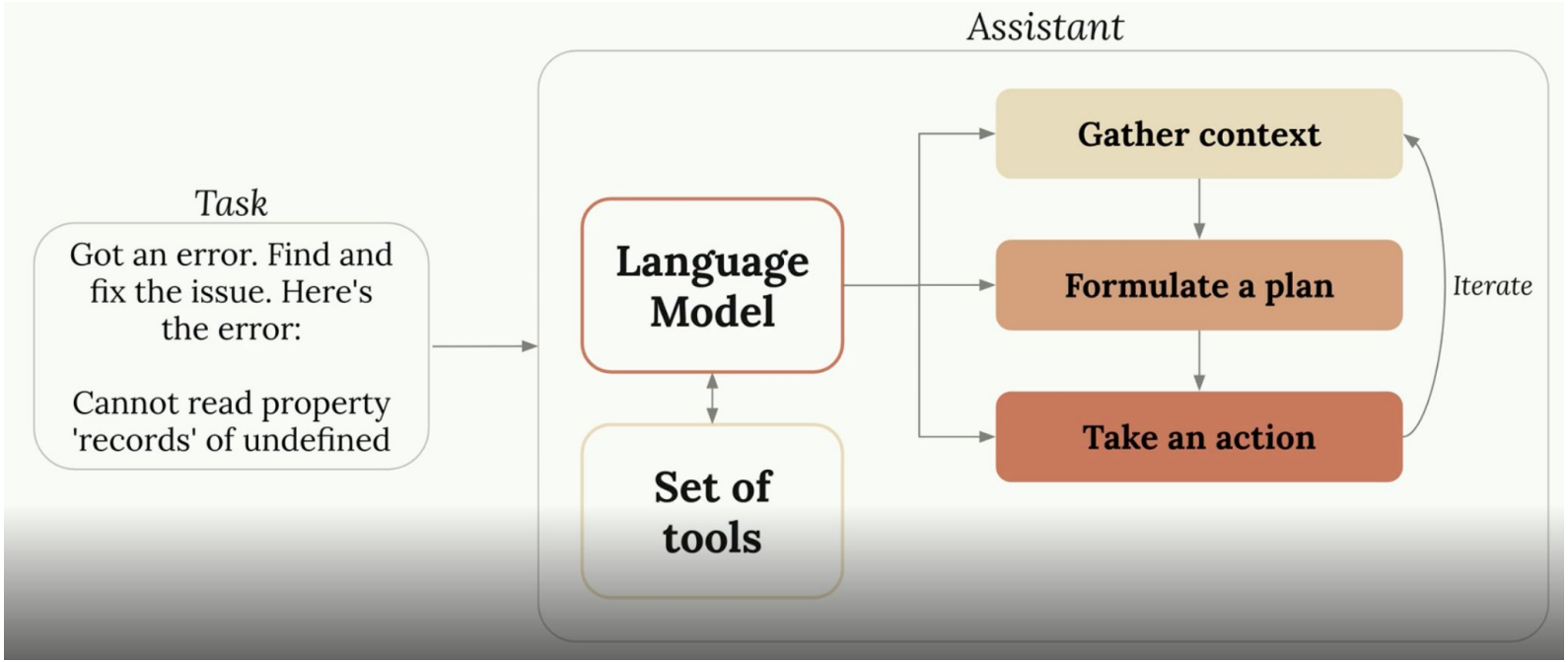
Model Context Protocol: Advanced Topics
Discover advanced Model Context Protocol implementation patterns including sampling, notifications, file system access, and transport mechanisms for production MCP server development.

Claude with Amazon Bedrock
As part of an accreditation program created for AWS, Anthropic launched a first-of-its-kind training for AWS employees. Here's the full course so you can follow along.

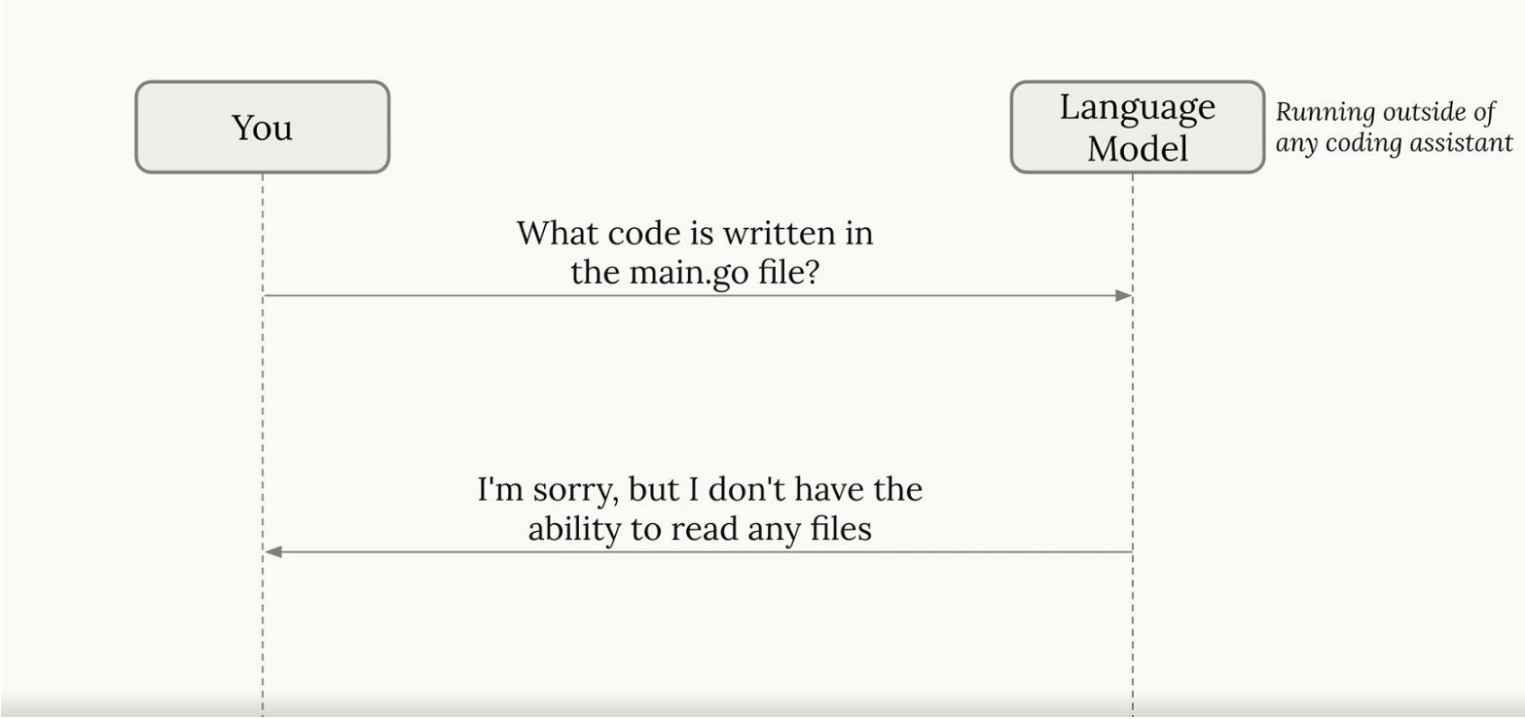
Claude with Google Cloud's Vertex AI
This comprehensive course covers the full spectrum of working with Anthropic models through Google Cloud's Vertex AI.

Teaching AI Fluency
This course empowers academic faculty, instructional designers, and others to teach and assess AI Fluency in instructor-led settings.

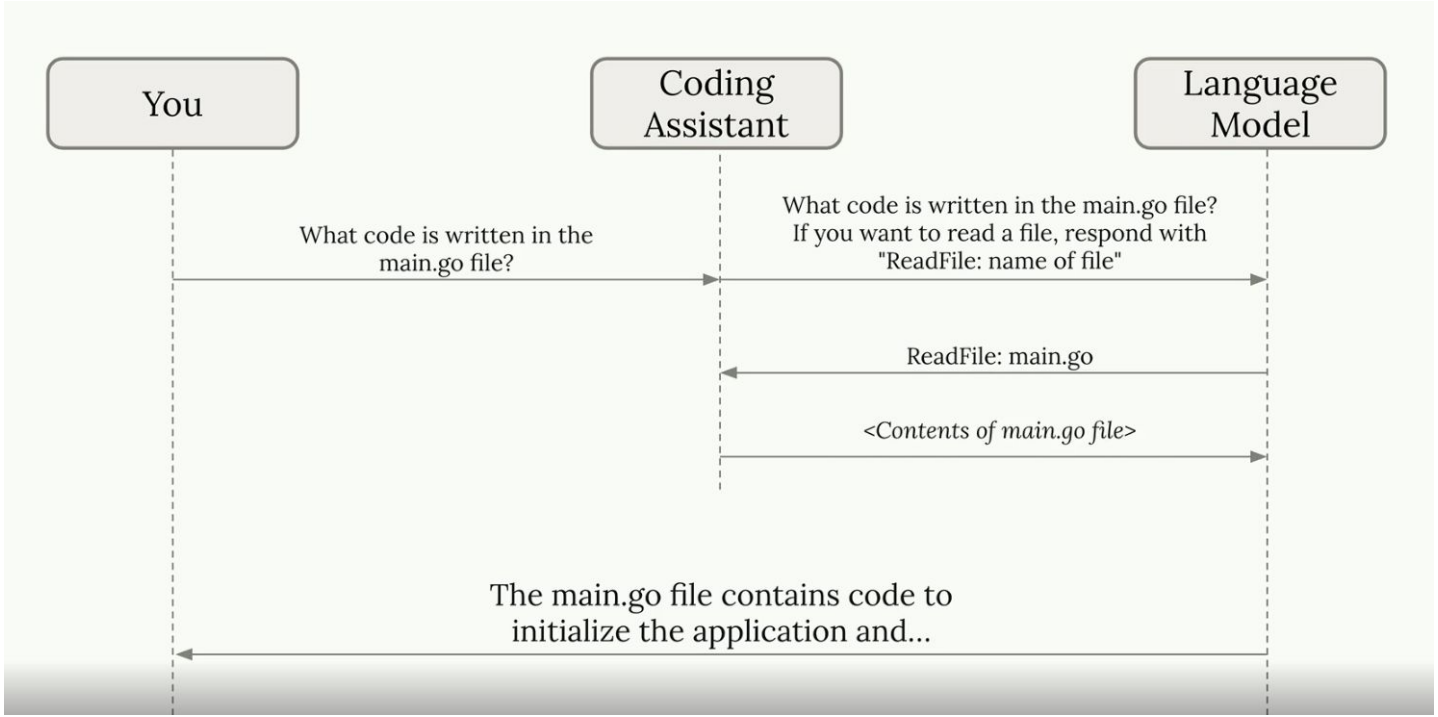
Claude Code Overview



Claude Code Overview Cont.



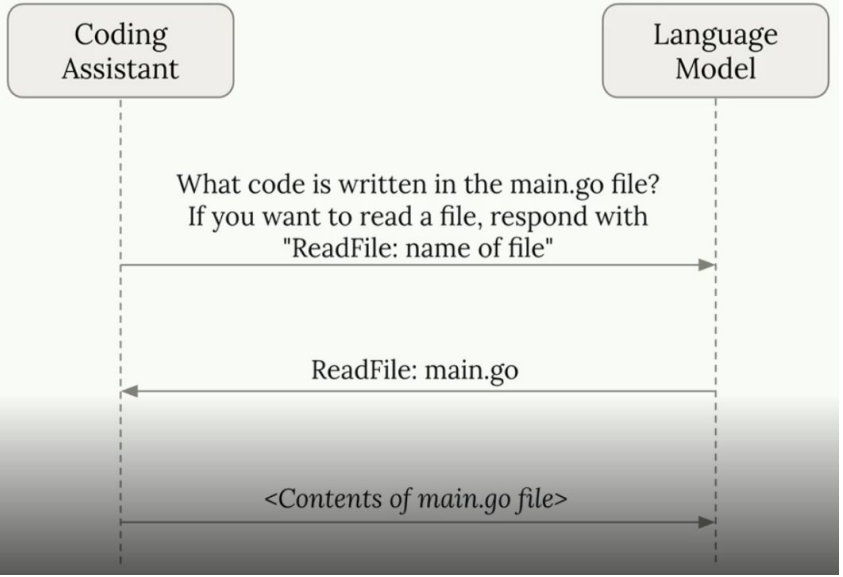
Claude Code Overview Cont.



Claude Code Overview Cont.

Tool Use

- Models are given plain text directions on how to respond a certain way to use a 'tool'
- When the model responds with a request to use a tool, the coding assistant does whatever the tool is supposed to do (read a file, write a file, make a request, etc)
- **The Claude series of models (Opus, Sonnet, Haiku) are particularly strong at understanding what tools do and using them to complete tasks**



Claude Code Overview Cont.

Tools with Claude Code

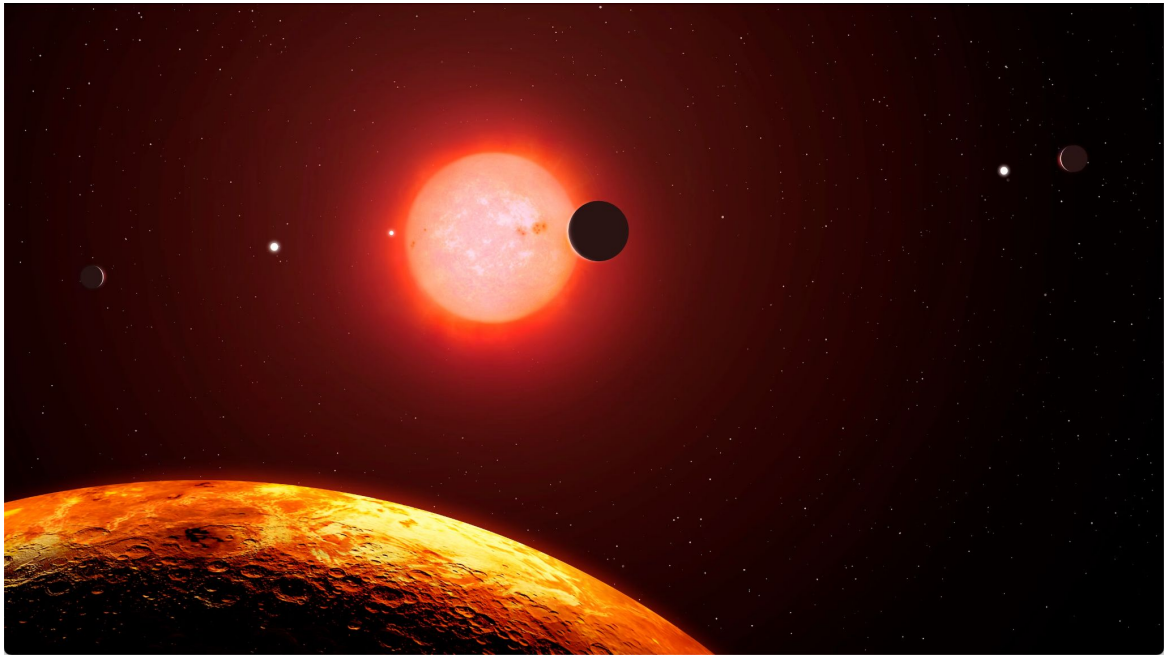
Name	Purpose
Agent	Launch a subagent to handle a task
Bash	Run a shell command
Edit	Edit a file
Glob	Find files based upon a pattern
Grep	Search the contents of a file
LS	List files and directories
MultiEdit	Make several edits at the same time
NotebookEdit	Write to a cell in a Jupyter notebook
NotebookRead	Read a cell

Continued...

Name	Purpose
Read	Read a file
TodoRead	Read one of the created to-do's
TodoWrite	Update the list of to-do's
WebFetch	Fetch from a URL
WebSearch	Search the web
Write	Write to a file

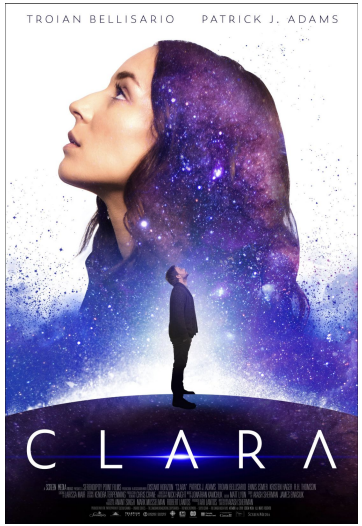
DEMO!

The Romans had a *Latin* saying: “Ad astra per aspera”



“To the stars through difficulties”

THANK YOU FOR YOUR ATTENTION!



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(*I only use LI Messages*)

FYI: TESS and transits are featured in the sci-fi movie: *Clara* (2018)