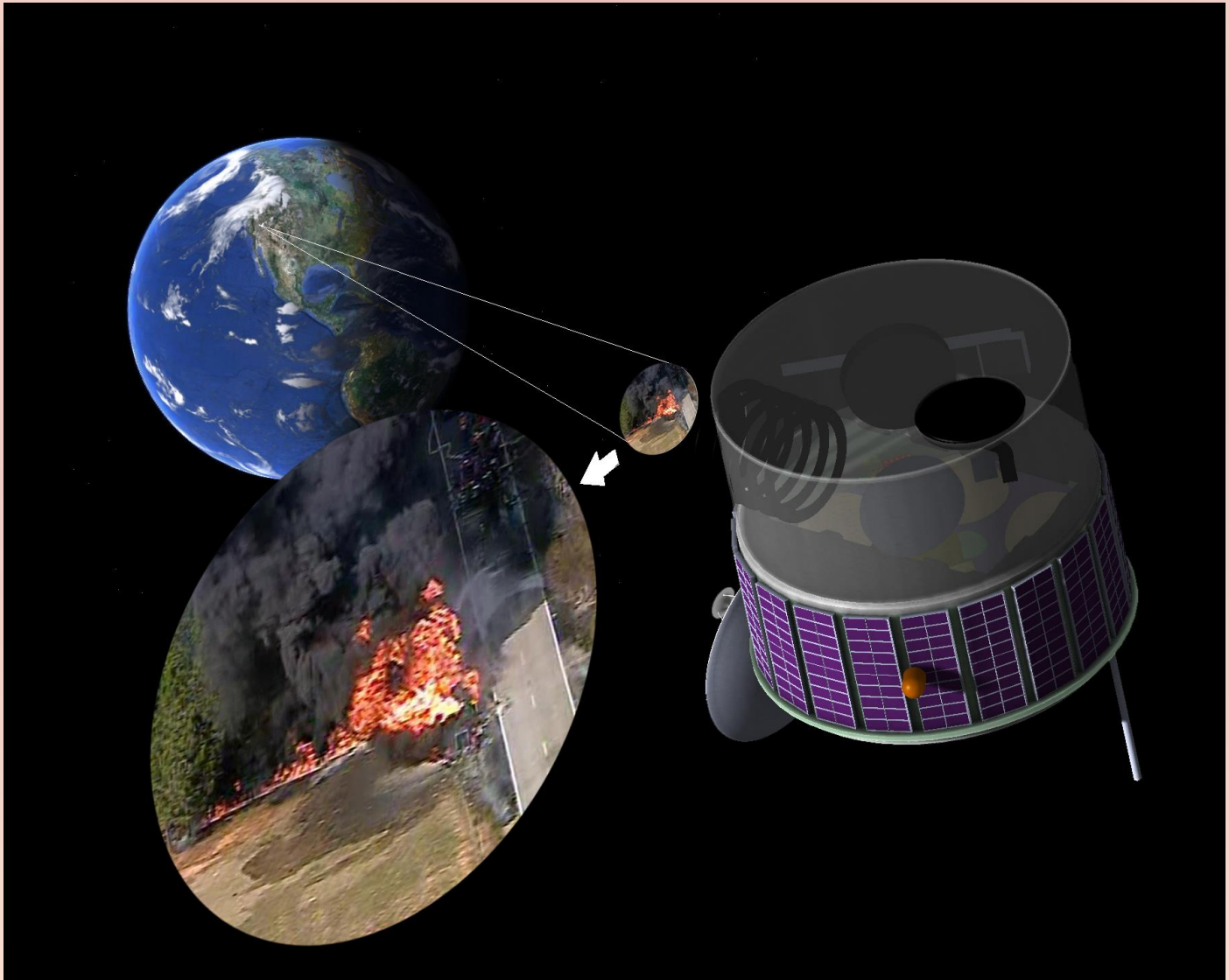
FUEGO:

Fire Urgency Estimator on Geosynchronous Orbit

(starting point of our journey…)



FUEGO:

Fire Urgency Estimator on Geosynchronous Orbit

Satellite Characteristics:

- 24/7 (except clouds – but clouds not a problem in California, for example)
- Fast – exposures are a few seconds
- Sensitive – 10 ft. x 10 ft.
- CHIRP Inspired Version could help pay for itself in one mega-fires, if suppression is quick

FUEGO:

Enhanced FUEGO now: Sensors at many altitudes (including towers now)

FUEGO:

History:

- Light particles from galaxies a billion years away

Enabling Technologies: Sensors, automation, computers, processing amazing amounts of data to look for a small bright spot.

- Oakland fire (1989): design study indicated satellite would have > $1B worth of detectors alone …
- Detectors becomes 10,000X less expensive
- Remote Sensing Paper (google pennypacker, remote sensing and fuego)
- Vince and Everett and TFRSAC !!

Who? Principal Fuegans

• UC Berkeley: Carl Pennypacker	Organizer, system architecture, sensors & algorithms
• Terra-Vista: Donn Walklet, Bill Kruse	Business & GIS
• Anne Holler	Distributed Computing
• Drone America: Mike Richards, Kyle Pruett	UAVs
• UCSD / WIFIRE: Ilkay Altintas	Models and Workflows
• Fireball: Tim Ball, Ryan Dotson	Navigation, Databases, Sensors, Fusion, Acquisition, Execution

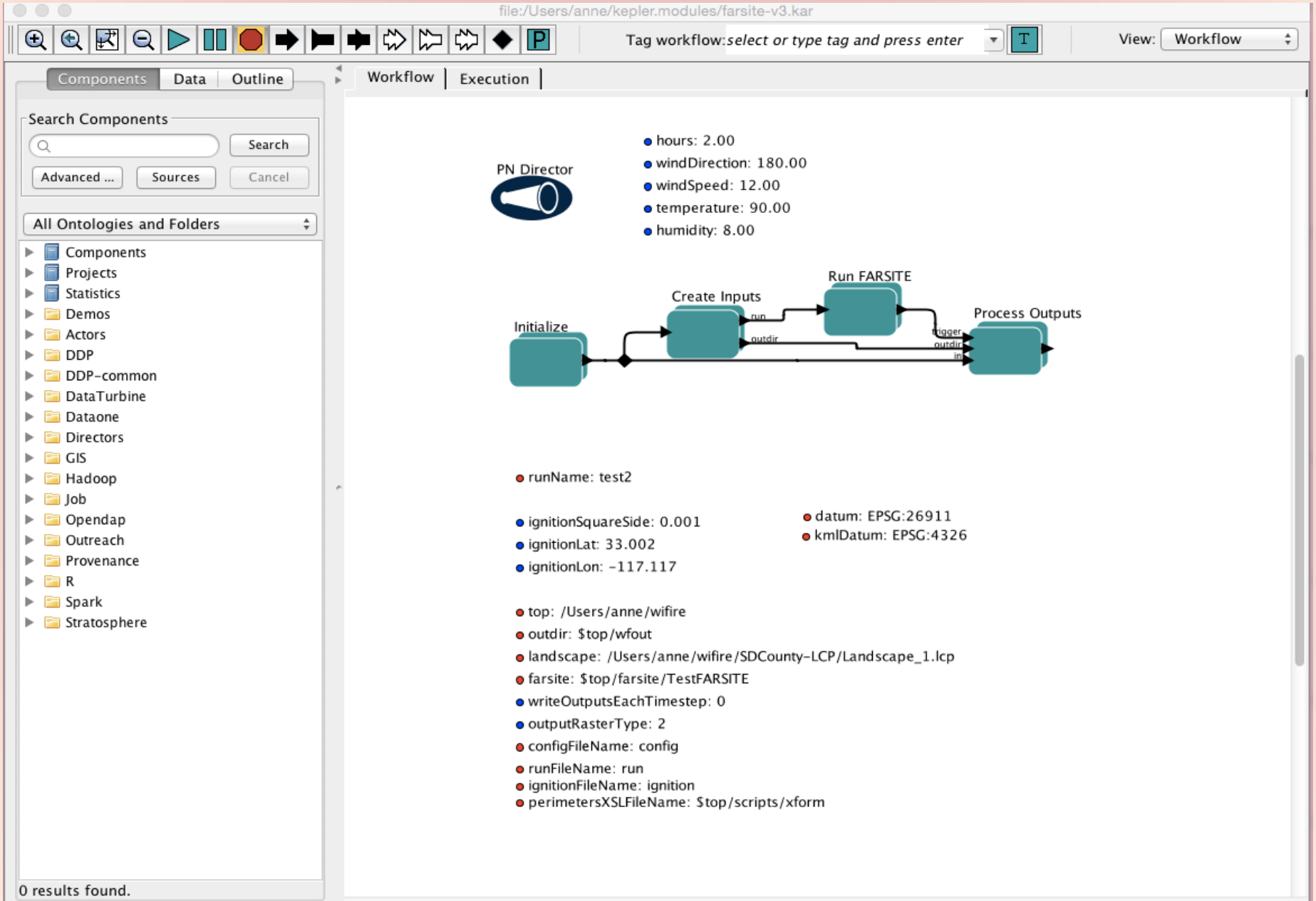
FUEGO Goals:

- ***Long Term***: Build a system with successively large area coverage and increasing resolution to find small fires (10ft x 10ft) from geosynchronous orbit, and feed it into a powerful intelligence/simulation/action cycle
- ***Now:*** Contribute to high-frequency, high resolution infrared data acquisition, in the spirit of NIROPS. Exercise and help inform simulation programs

Some of the FUEGO Team Activities

- Work on WIFIRE-FUEGO Workflows/GIS/simulations by Bill and Anne
- 2 Proposals submitted (NASA) and 1 Crowd funding campaign
- Greater understanding of how to be able to deliver some near- term solutions
- Understanding of existing satellite resources that can help now! (NOMS)
- Manned UAV flights over Berkeley bbq's for signal studies
- Forging ahead with UAV Raspberry Pi system for prototype studies, software tests, etc.
- Studies of San Diego Fire Tower camera data
- Development of plans and tests (pending funding) of long-duration UAV systems for fire detection and management
- Solidifying and growing our team reasonably

WIFIRE/FARSITE/KEPLER WORKFLOW



Immediate Goals

Working with Fireball, WiFIRE, Kruse/Holler:

1) Collect great GIS for our test-bed (probably San Diego)

2) Acquire with Fireball Manned UAV System very high frequency time and high spatial resolution data

3) Put GIS and fresh data into FarSite and undertake data experiment. See how it goes…

4) Continue process of GIS/Data acquisition/simulation validation. Compare to what happens with fires