ROPACS ANNUAL NETWORK MEETING
NOV 18 2009

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New ESR at UH

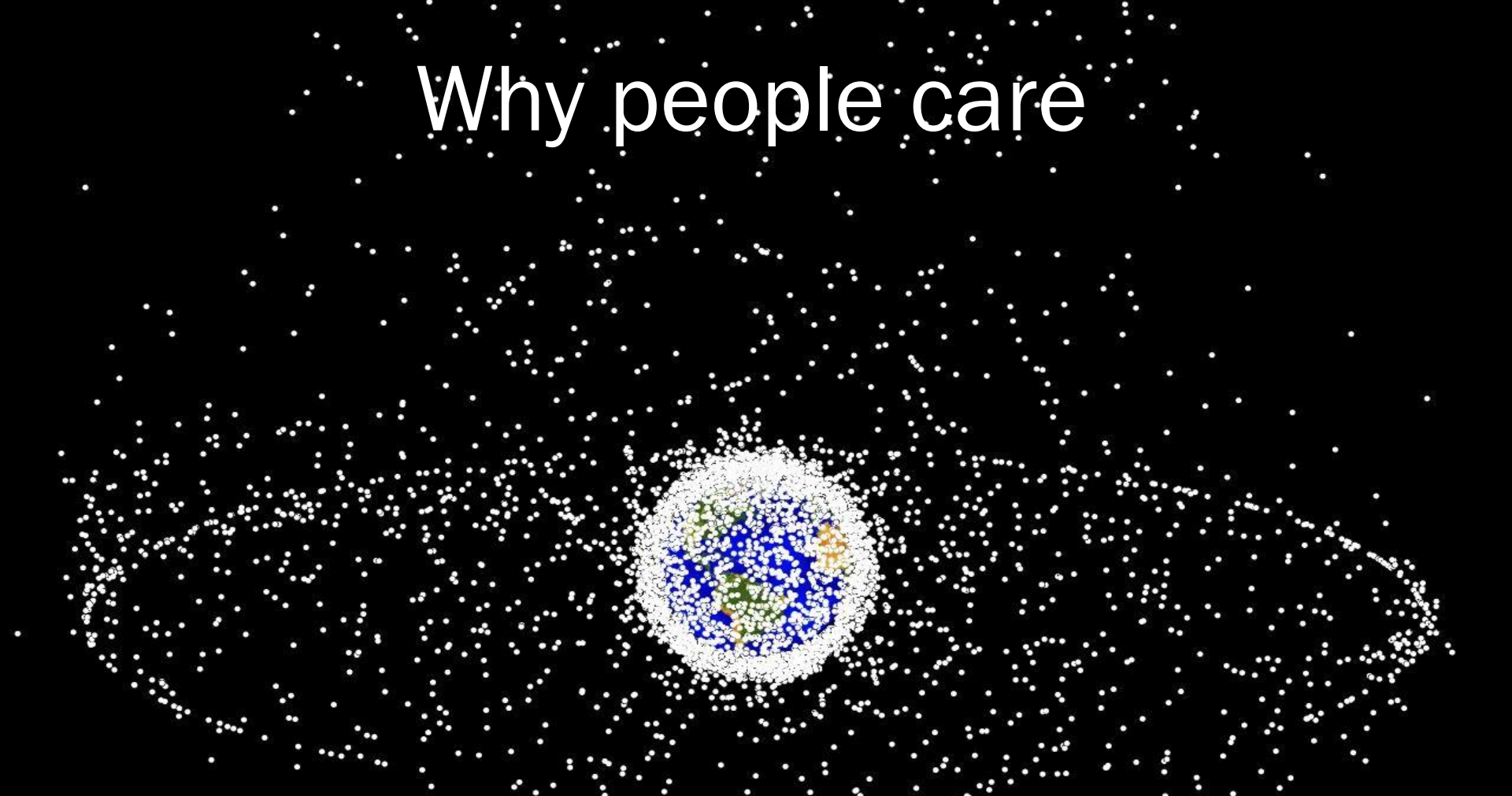
Outline

- Background
  - Education
  - Recent Experience
    - Why people care
    - What I Did
- Planed Projects for RoPACS

Background

- Undergraduate Studies
  - B.S. Astronomy, B.S. Physics – University of Washington
    - Mostly observational work using the university's 0.5m telescope as well as the Apache Point 3.5m
    - Some radio astronomy
  - Teaching, Outreach
- Recent Research and Activities
  - Space Situational Awareness
  - Instrumentation and development of the High Accuracy Network Determination System (HANDS)
  - Satellite light curve inversion for attitude and shape recovery
  - Orbital determination

Why people care

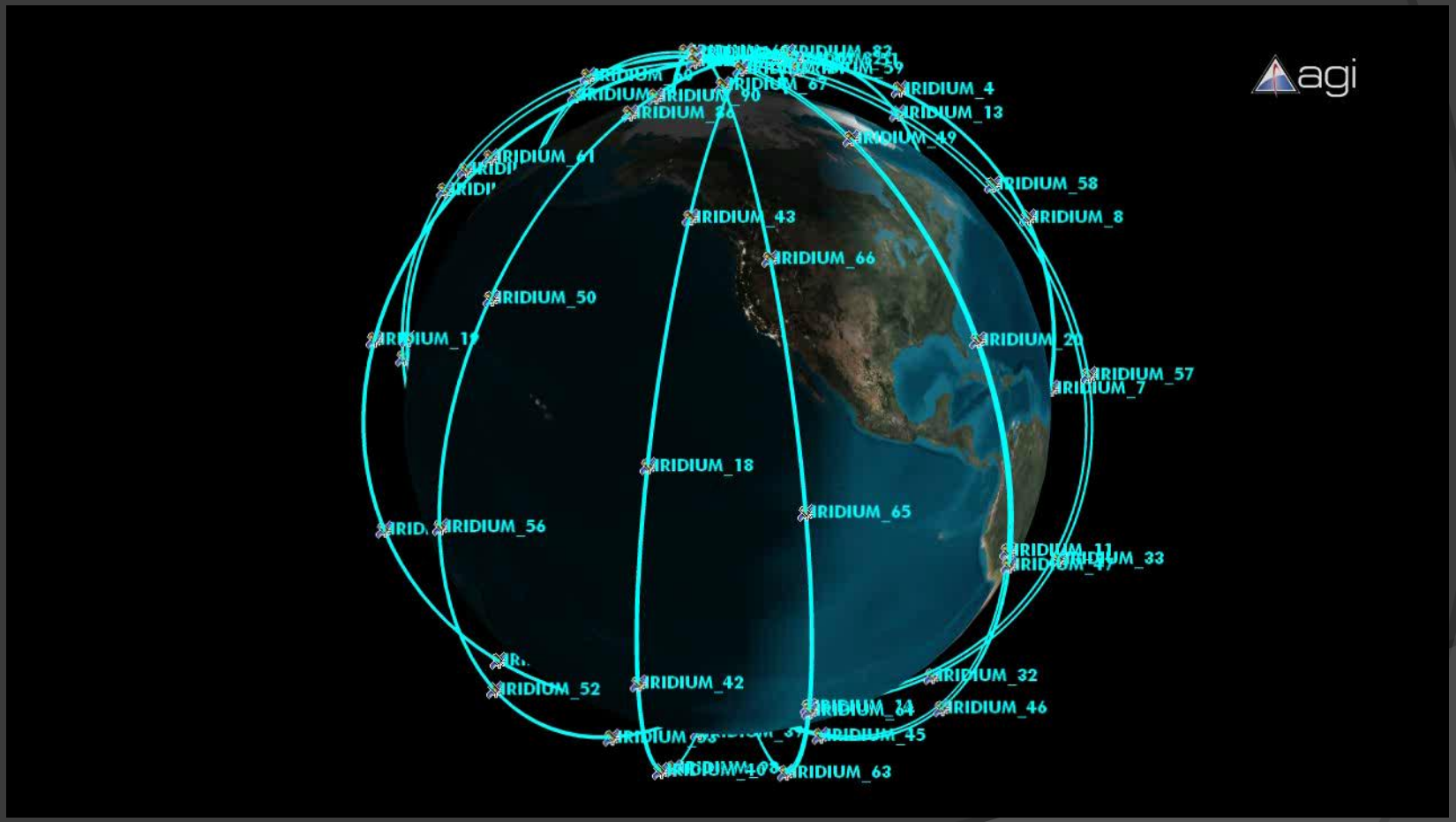


- More than 19,000 objects are tracked by the space surveillance network (SSN)
- No ‘Air Traffic Control’ to speak of. Nations have relied on ‘Big Space’ principle.
- The world currently relies on the US Air Force for the bulk of the telemetry data

Major recent debris events

- Chinese ASAT test, Jan 2007
  - 2,300 pieces of new debris
  - Debris cloud estimated to last for decades
- Iridium 33 - Cosmos 2251, Feb 2009
  - Caused by lack of knowledge the space environment

Eye Catching Movie



Scary Part...

- Collisions like this could cause a cascade effect:
  - Debris collides with operational satellites creating more debris impacting more satellites etc...
  - Could render LEO environment unsafe

All launches off the planet could become impossible

Now that you know why people care…

- HANDS – A world wide network of low cost, commercial-off-the-shelf small telescopes to enhance current space surveillance network.
- Uses photometric and astrometric measurements to provide ephemeris and tomographic data.

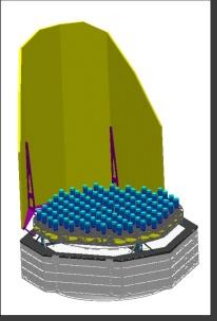
Possible collaboration

- Currently discussing the possibility of using HANDS for transiting planet detection.
  - $$$ (£££) may be an issue...

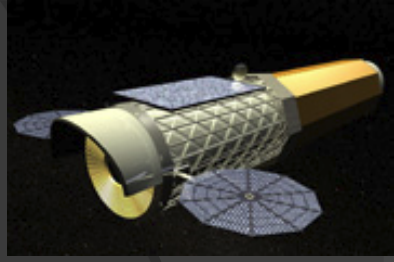
Current Work

Spectral Characterization of Exoplanets

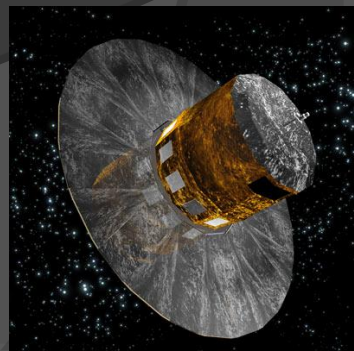
- Working with John Barnes on his work with near-infrared spectroscopy of Jovian planets
  - Still in the early stages of contribution



Cosmic Visions/Astrium



- Work with Astrium on preliminary design studies/concepts for new space missions
  - Pre Phase A studies for missions currently being proposed
  - Work to define exoplanet characterization/discovery parameter space
    - Compare with current proposed missions to see if there is a mission concept that has not been proposed that could produce interesting results
- Simulate local (~50pc) exoplanet population to be used as metric for future space missions
  - Produce target statistics for future transit studies based on current planet formation models and local stellar population information
  - Focus studies on cooler stars (very little modelling has been done)
- End to end simulations for SEE-Coast mission working with the Paris Observatory



Current Results

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