

Have We Been Visited?

Bracewell Probes

Unmanned
Orbit around another star
Wait for civilization to appear
Establish contact
Radio results to Earth

Is there a Bracewell Probe in Solar System?

Long-delayed echoes (1- 30 sec)
Duncan Lunan 1973
→ Epsilon Boötes (Binary star)
→ Contact attempted
now discounted

If use Daedalus technology (fusion)
 $R_M = 150$ (need to decelerate)

Visits in the Past?

- In historical times?
- Erich von Daniken is most famous promoter
 - Pyramids, precision stone work
 - Drawings on Nazca plain
 - Easter island statues
 - Note western bias
 - No need for aliens to help with Stonehenge

Ongoing visits?

- Flying saucers (after WWII)
- Neutral term: Unidentified Flying Objects (UFOS)
- Evidence is primarily anecdotal

Reliability

e.g. Night advertising aircraft

< 10% correctly described these

⇒ Unreliable witnesses ⇒ some ordinary objects will fall into UFO category

Statistics of UFO cases

90% of UFOs eventually identified (IFO)

No difference between UFOs and IFOs in time of day, duration, age or gender of witness, occupation, or UFO interest

Both UFO and IFO incidents involve people who, on average, are much more interested in UFOs.

Statistics of UFO belief

"UFOs are extraterrestrial visitors"

40 - 50% of people nationally

Previous 309L classes__ Yes (before class) Yes (after class)

UFOs exist? 68% 40 - 50%

If Yes, controlled by E.T.? 76% 45 - 55%

Expect this class to attract more believers, BUT

Austin also seems more credulous

Student polls 1983, 1995

~ 80% Believe in UFOs

Education:	High School or Less	Doctorate or Working on it
	62%	88%

50% believe Government covers up UFO evidence

What we Believe

	1983	1995		
1. ETs are friendly	84%	53%		
2. ETs are friendly	1995			
	males	females		
	47%	58%		
3. By ethnicity				
Believe in UFOs	Asian-Am	African-Am	Hispanic	White
	35%	61%	77%	81%

Attitudes of Scientific Community

Generally much more skeptical

Repeated studies found no evidence of alien connection

2 studies suggested UFOs worthy of further research

1. Allen Hynek

→ Categories

2. Stanford Panel 1997

Peter Sturrock, von Eshleman, Thomas Holzer

"Deserves Scientific Study" but no evidence of

"involvement of an extraterrestrial intelligence"

Categories of UFOs

1. Nocturnal lights
Clear weather, usually 8-11 PM
2. Daylight Disks
Usually disks, some cigar shaped
3. Radar-visuals
Detected by radar as well
4. Close encounters
First Kind - UFO seen closer than 500 feet
Second Kind - Physical effects - burnt vegetation, electrical problems
Third Kind - Observation or encounter with Aliens
A. Hynek

Detection of Alien Spacecraft

Matter-antimatter annihilation → γ -rays

We have γ -ray detectors on satellites

1. Military - to watch for nuclear tests
reported γ -ray bursts from space

↓

2. NASA satellite: Gamma-ray observatory (GRO)
was in orbit from 1991 to 2000
could detect annihilation $0.02 \frac{\text{grams}}{\text{sec}} \left(\frac{R}{1\text{AU}} \right)^2$

⇒ No spacecraft decelerating within 1 AU with mass
of ship exceeding 90 grams since 1991.

[Assumes electron-positron annihilation for specific numbers]

Case Study: The Roswell Incident

- | | |
|------|---|
| 1947 | Rancher finds strange debris
Rumors of "flying saucer"
Attributed to weather balloon |
| 1978 | Marcel (Intelligence officer at AFB in 1947)
Talks to <u>Inquirer</u> → big UFO interest
Claims of Exotic Matter (originally
balsa wood, tin foil, rubber, tape, paper)
Claims (& movies) of Alien Autopsy
Claims of a Government cover-up |

Case Study: The Roswell Incident

~ 1994 -1995

Congressional inquiry → GAO



USAF finally tells the story

Project Mogul

High altitude balloons to "listen" for nuclear bomb
detonations (it did detect 1st Soviet bomb - 1949)

But winds → pushed balloons out of range →
discontinued in 1950

One tracked to near where debris found - then contact lost

Photos of debris match description of Mogul balloons

Secrecy → Conspiracy theories

UFO Pictures...







