



THE FLIGHT CHARACTERISTICS AND PHYSICS OF UAP

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[HTTP://UAPEXPEDITION.ORG](http://UAPEXPEDITION.ORG)



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THE FIVE OBSERVABLES

ADVANCED AEROSPACE THREAT IDENTIFICATION PROGRAM (AATIP)

DIA PROGRAM 2007 - 2012



1. Positive Lift
2. Sudden/Instantaneous Acceleration
3. Hypersonic Velocity without Signatures
4. Trans-Medium Travel
5. Low Observability or Cloaking

The VAST MAJORITY of UAP are misidentifications
of astronomic and atmospheric phenomena
or conventional aircraft.

Another large proportion are hoaxes

Only about 3% of UAP are of interest
as a subset of those appear to be
Anomalous Unidentified Aircraft

MISTAKEN IDENTITY

Vancouver BC



MISTAKEN IDENTITY

Vancouver BC



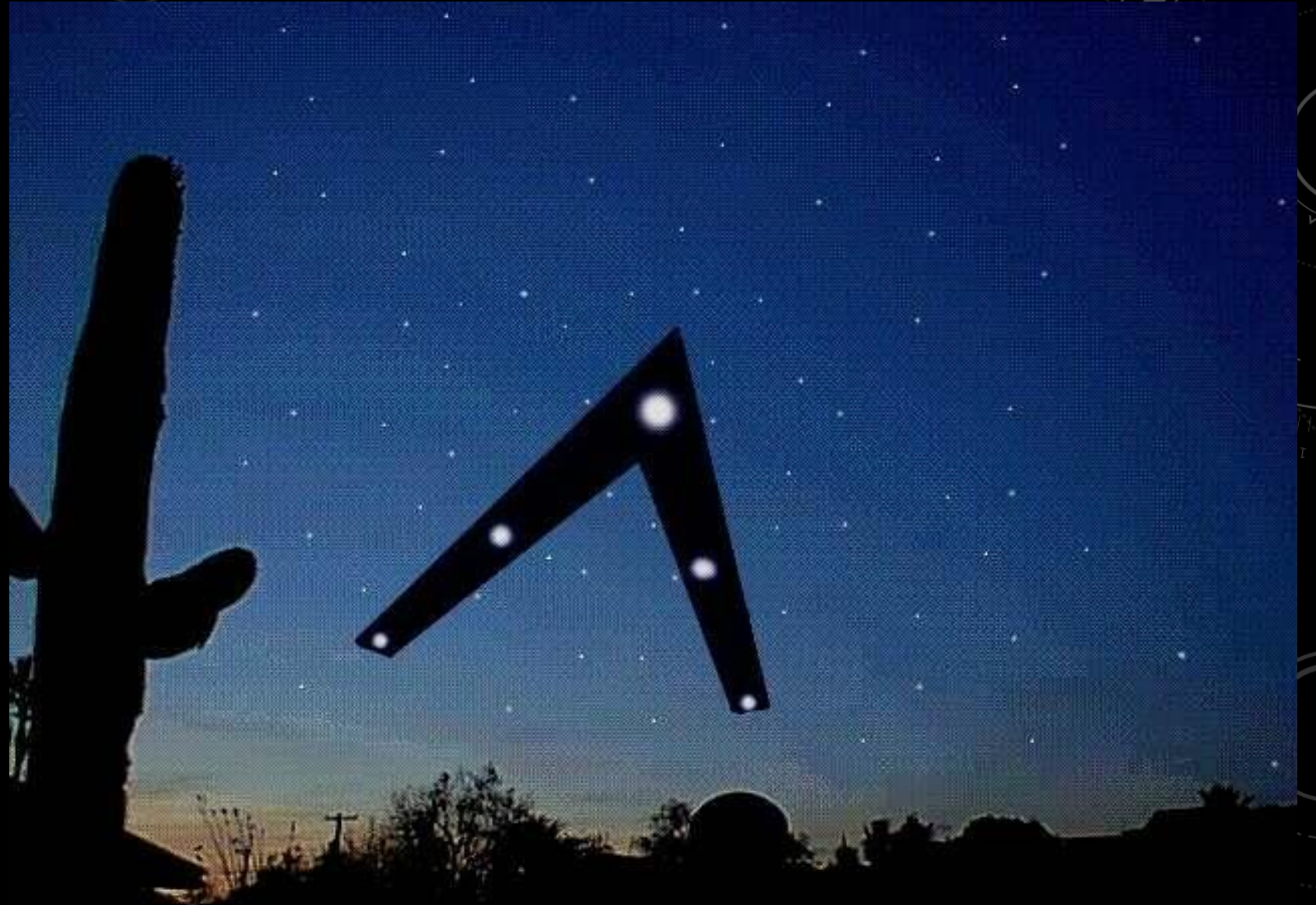
Sea Gull




ALTERED IMAGES

The stars are not real.

Guess what else
probably isn't real???



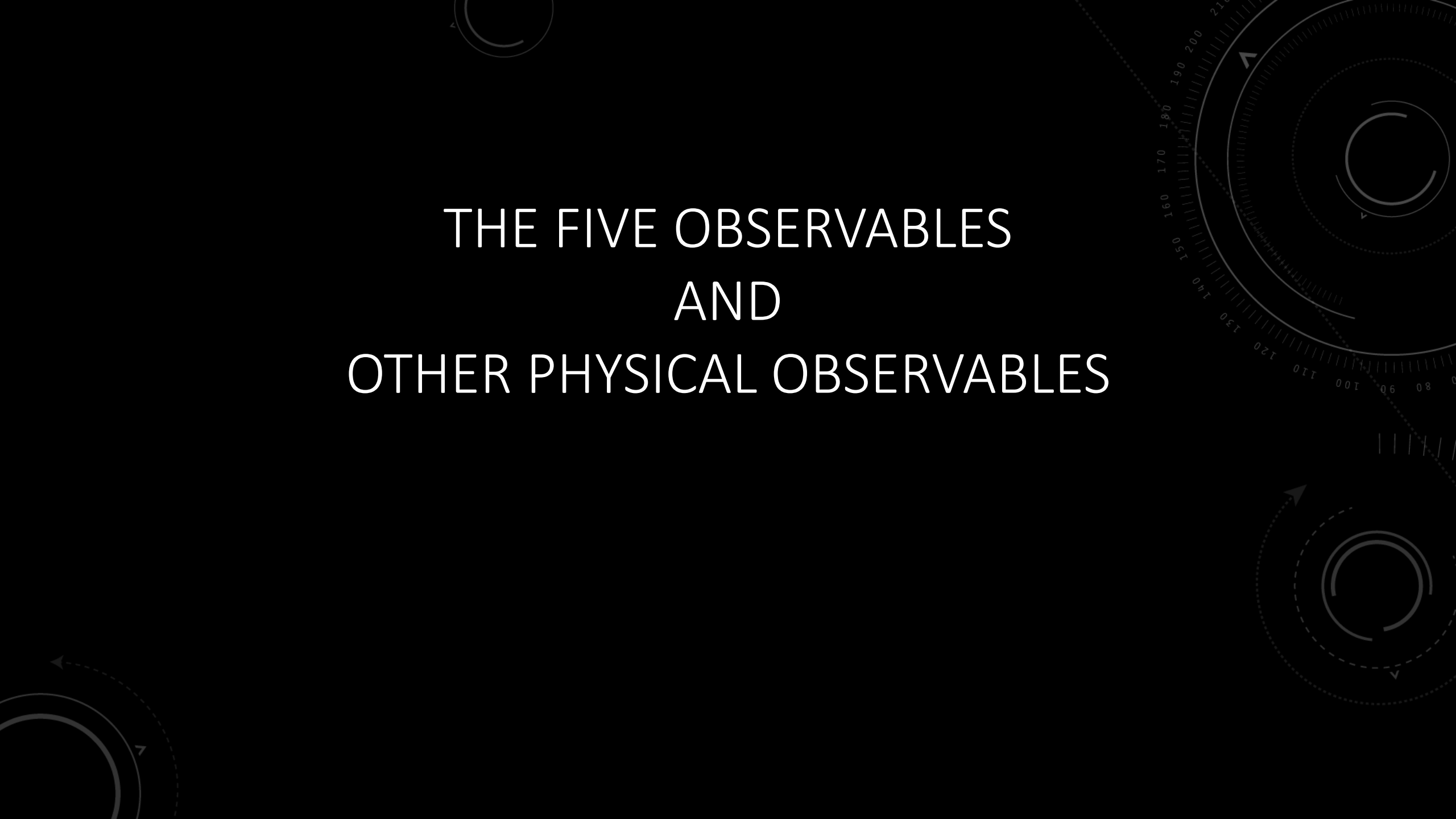
Copyright: Tim Lay 1997



SOME UAP HAVE BEEN
PARTIALLY IDENTIFIED
AS STRUCTURED CRAFT

THESE CASES ARE OF
GREAT INTEREST

THE FIVE OBSERVABLES AND OTHER PHYSICAL OBSERVABLES



POSITIVE LIFT

Important Points:

- No apparent lift or control surfaces
- Unknown how lift is generated
- Capable of flying/hovering for LONG periods of time
 - when chased by jets, jets often run low on fuel (eg. Washington DC 1952; Lakenheath 1956)
- Propulsion Mechanisms Unknown
- No heat signature from engines or exhaust



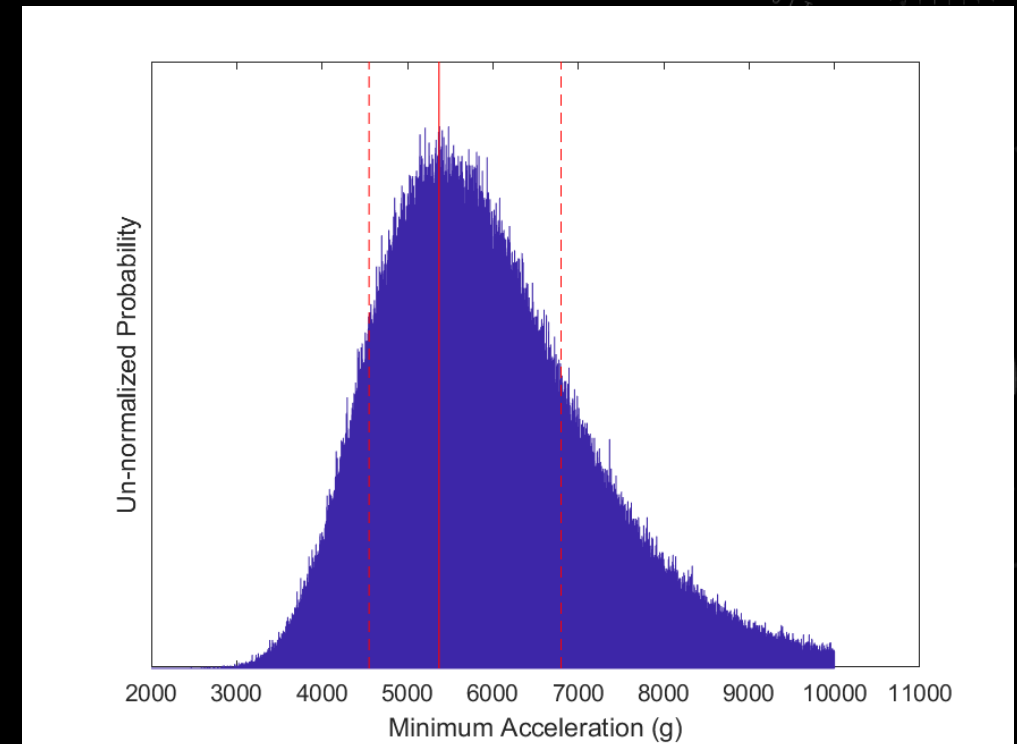
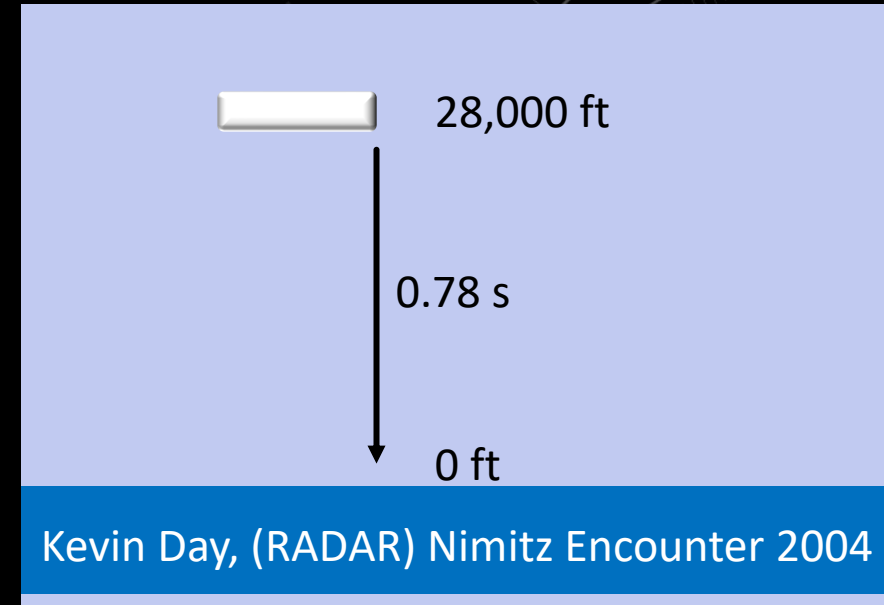
US Homeland Security,
Aguadilla, Puerto Rico. April 26, 2013

SUDDEN/INSTANTANEOUS ACCELERATION

Important Points:

- “Instantaneous” really means Too High to Measure
- Estimated / Measured accelerations range from about 70g to over 5000g

Knuth, Kevin H., Robert M. Powell, and Peter A. Reali 2019.
"Estimating Flight Characteristics of Anomalous Unidentified Aerial Vehicles"
Entropy 21, no. 10: 939.
<https://doi.org/10.3390/e21100939>



HYPERSONIC VELOCITY WITHOUT SIGNATURES

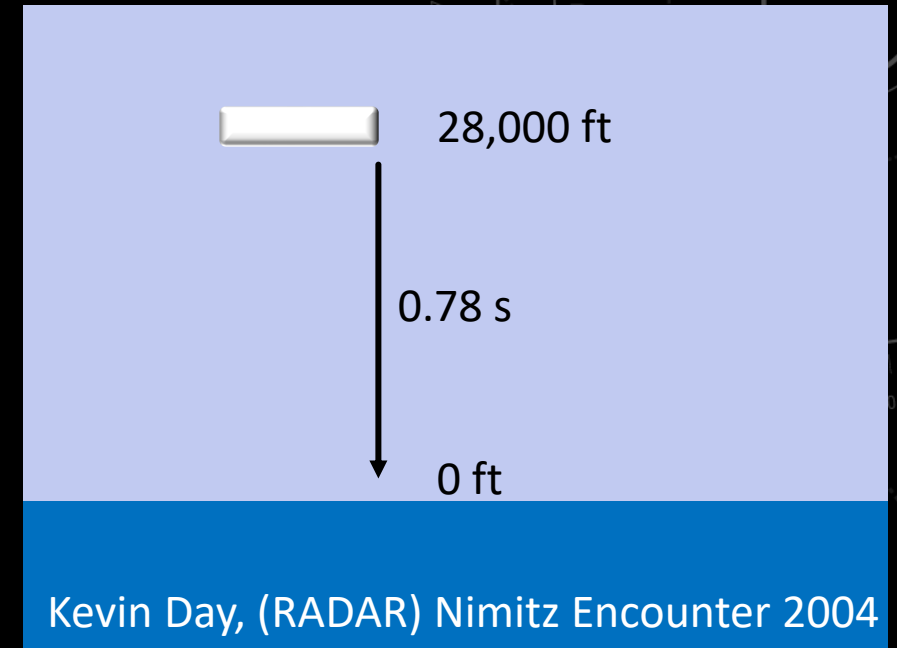
NO SONIC BOOMS

Important Points:

- UFOs have been tracked at Hypersonic Speeds in air

Hypersonic Speeds as high as:

- Mach 55 \approx 42,500 mph (Oberth 1954)
- Mach 60 \approx 46,000 mph (Knuth, Powell, Reali, 2019)
- No energy deposition when decelerating or stopping
 - Nimitz 2004 drop maneuver should have deposited at least 4.3×10^{11} J of energy (100 tons of TNT) assuming a mass of 1000 kg (Knuth, Powell, Reali, 2019)



Their speed is sometimes very high. 19 km/sec has been measured with wireless measuring instruments (radar). Accelerations are so high that no man could stand it; he would be pressed to the wall and bruised. The accuracy of such measurements has been doubted. If there would be only 3 or 4 measurements, I would not rely upon them and would wait for further measurements, but there is existing more than 50 such measurements; the wireless sets (radar) of the American Air Force and Navy, which are used in all fighters, cannot be so inaccurate that the information obtained with them can be doubted completely. Hermann Oberth 1954

RELATIVISTIC ROCKET EQUATIONS

t is the elapsed time in the galactic frame

τ is the elapsed time in the spacecraft

a is the acceleration of the spacecraft

d is the distance traveled in the galactic frame

c is the speed of light

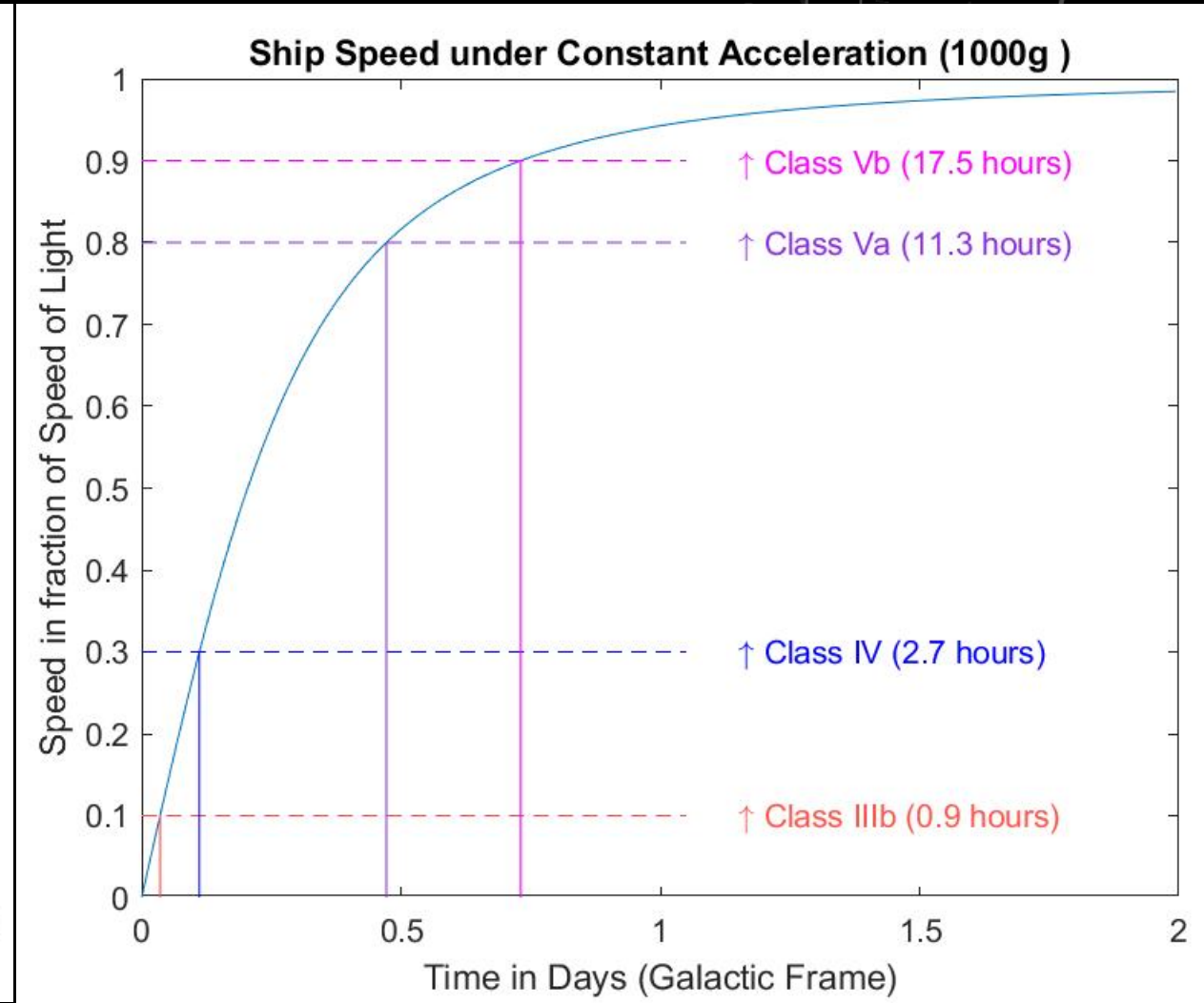
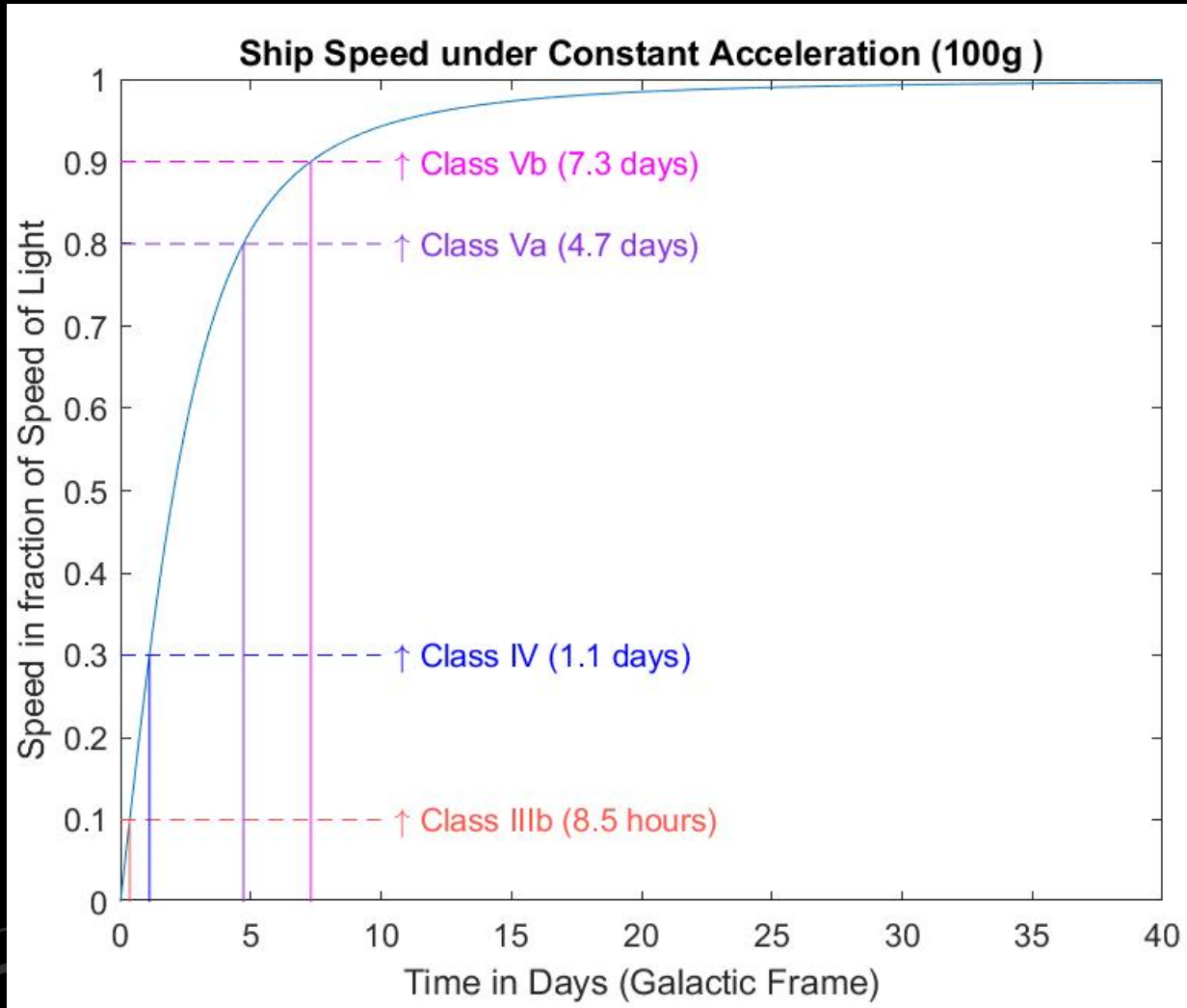
$$t = \frac{c}{a} \sinh\left(\frac{a\tau}{c}\right) = \sqrt{\left(\frac{d}{c}\right)^2 + \frac{2d}{a}}$$

$$\tau = \frac{c}{a} \sinh^{-1}\left(\frac{at}{c}\right) = \frac{c}{a} \cosh^{-1}\left(\frac{ad}{c^2} + 1\right)$$

$$d = \left(\frac{c^2}{a}\right) \left(\cosh\left(\frac{a\tau}{c}\right) - 1\right) = \left(\frac{c^2}{a}\right) \left(\sqrt{\left(\left(\frac{at}{c}\right)^2 + 1\right)} - 1\right)$$

$$v = c \tanh\left(\frac{a\tau}{c}\right) = \frac{at}{\sqrt{\left(\left(\frac{at}{c}\right)^2 + 1\right)}}$$

VELOCITY UNDER ACCELERATION

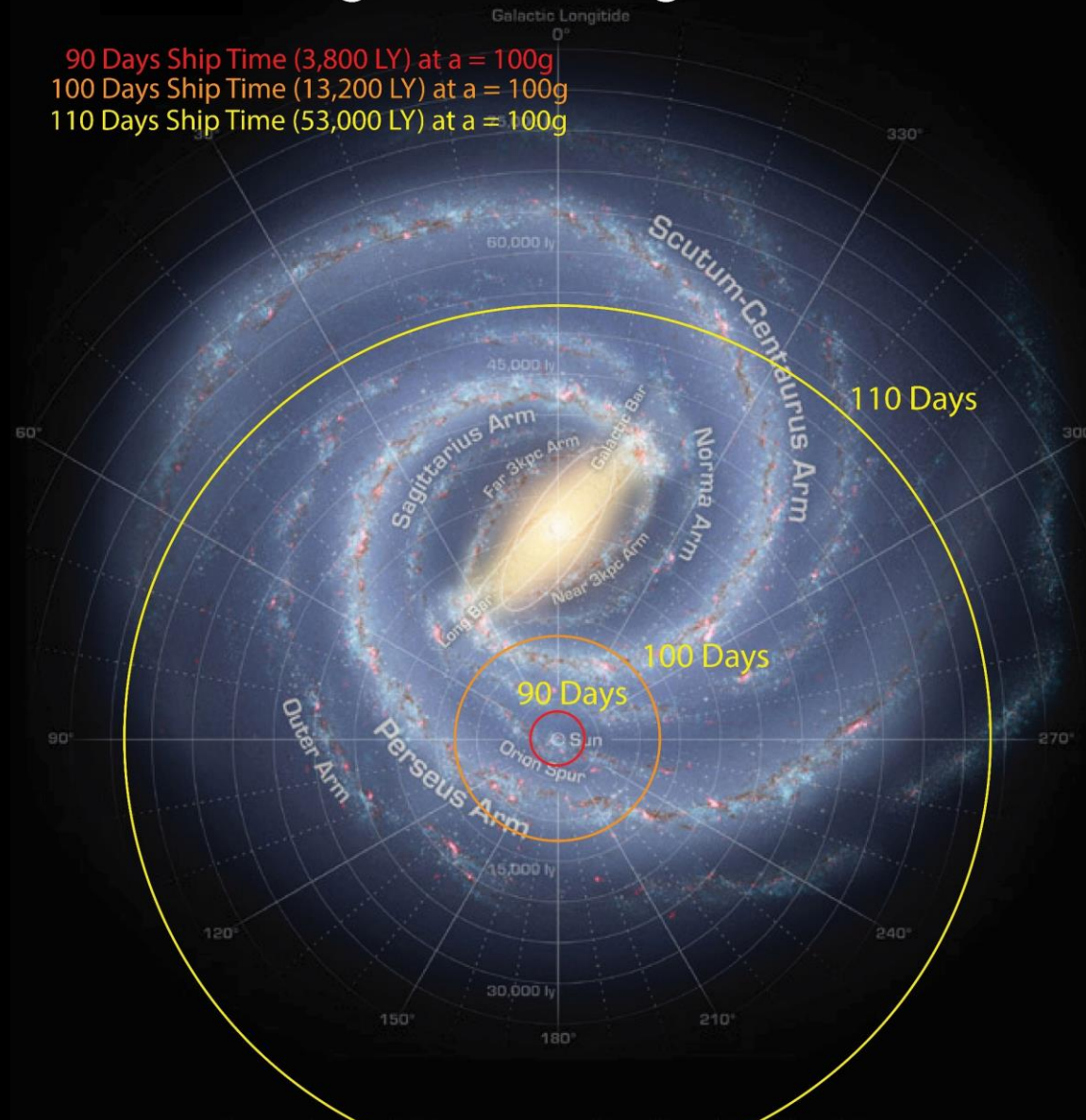


Range at $a = 100g$ Acceleration

90 Days Ship Time (3,800 LY) at $a = 100g$
100 Days Ship Time (13,200 LY) at $a = 100g$
110 Days Ship Time (53,000 LY) at $a = 100g$

At a $100g$ acceleration to the Midpoint followed by a $100g$ deceleration, a ship could traverse the galactic disk in about 4 months (ship time). Of course, relative to those in the galaxy, the trip will take about 100,000 years.

These things are thought to be spacecraft because they have the capability to move like interstellar spacecraft.



Annotated Roadmap to the Milky Way

(artist's concept)

Edited by K. H. Knuth

NASA / JPL-Caltech / R. Hurt (SSC-Caltech)

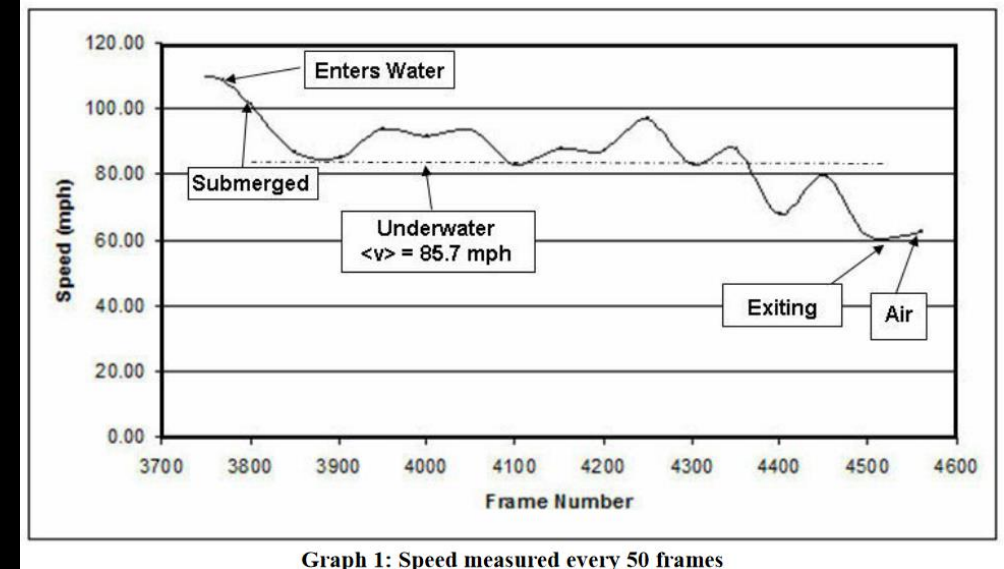
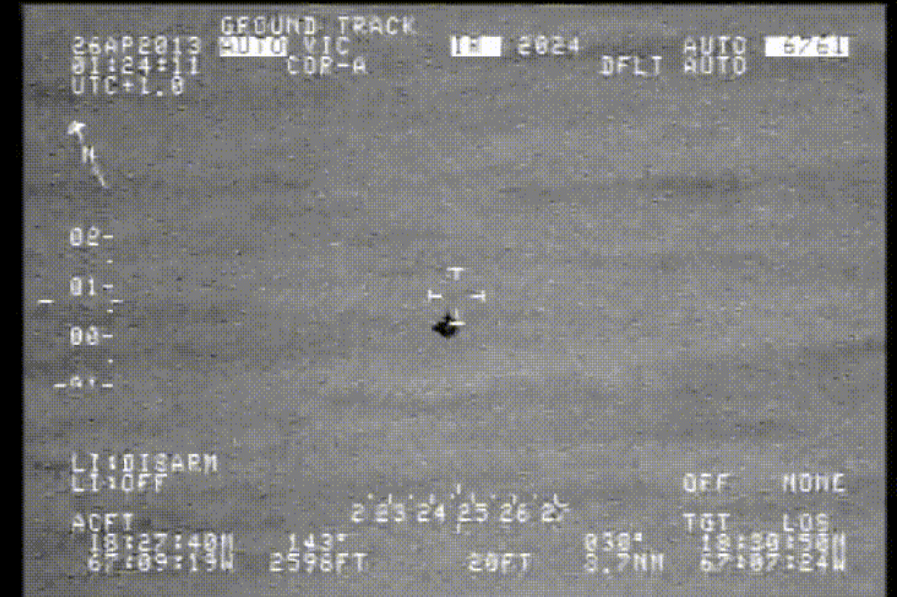
ssc2008-10b

TRANS-MEDIUM TRAVEL

Important Points:

- UAPs can travel effortlessly in multiple media: **space (vacuum)**, air, water, **solids**?
- Insignificant change in speed when entering a different medium

The Aguadilla UAP enters the water at a speed of just over 100 mph, and continues traveling through the water at about 85 mph



Graph 1: Speed measured every 50 frames

US Homeland Security, Aguadilla, Puerto Rico. April 26, 2013

<https://www.explorescu.org/post/2013-aguadilla-puerto-rico-uap-incident-report-a-detailed-analysis>

LOW OBSERVABILITY OR CLOAKING

US Homeland Security, April 25, 2013, Aguadilla, Puerto Rico

Important Point:

- Not only does the blurred object appear to change size, it also almost disappears!



LOW OBSERVABILITY OR CLOAKING

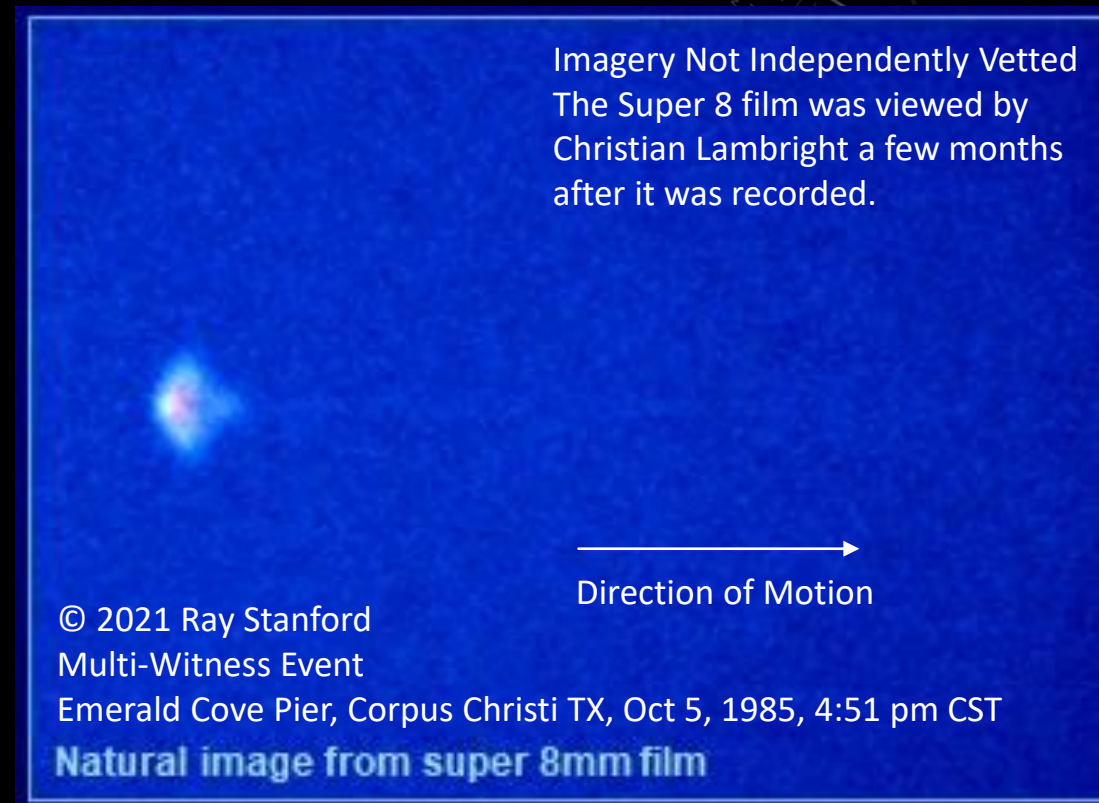
PLASMA SHEATH

Important Points:

- UFOs are sometimes surrounded by what appears to be a plasma sheath
- One source of emitted light
- Plasma and Heat make images blurry via plasma glow and refraction



US Navy Gimbal imagery 2015



[https://arc.aiaa.org/article/S0021-8718\(20\)30001-1](https://arc.aiaa.org/article/S0021-8718(20)30001-1)

HYPersonic VELOCITY WITHOUT SIGNATURES

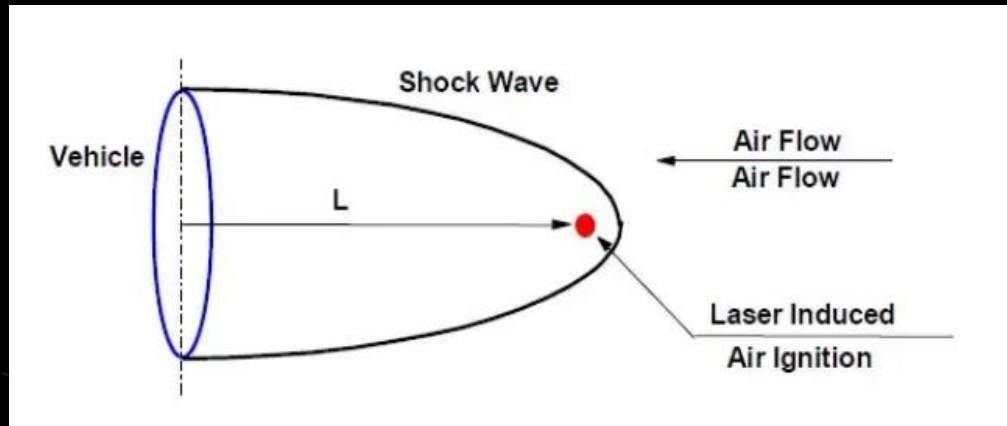
PLASMA BEAM AHEAD

THE WARZONE

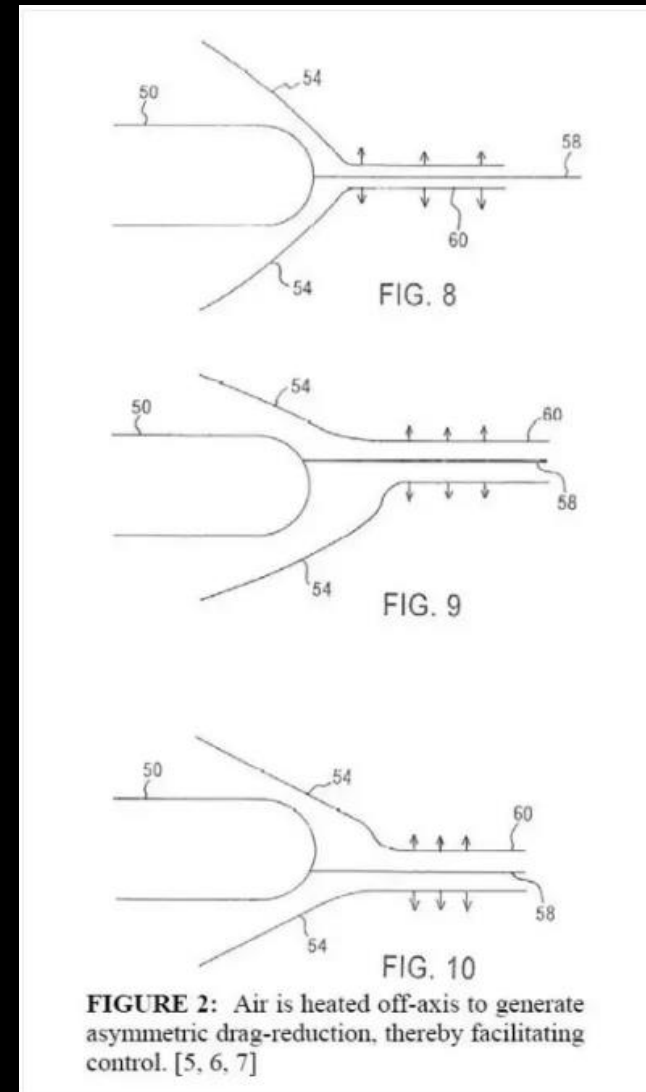
Blasting The Air In Front Of Hypersonic Vehicles With Lasers Could Unlock Unprecedented Speeds

For decades, the DoD has been researching a radical drag reduction technique that involves sheathing a vehicle in directed energy-induced plasma.

BY BRETT TINGLEY SEPTEMBER 24, 2020



Brazilian Society of Mechanical Sciences and Engineering



Tingley 2020, The Warzone
Kevin Kremeyer, US Patent US20120234395A1

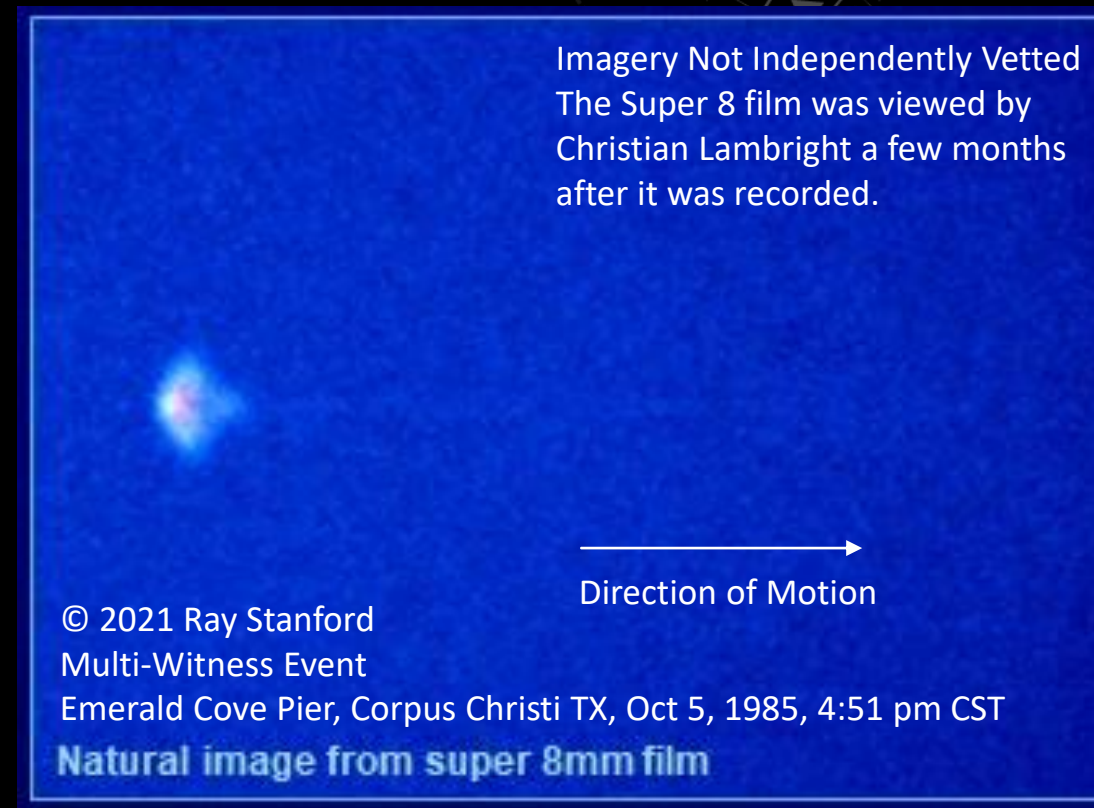


HYPERSONIC VELOCITY WITHOUT SIGNATURES

PLASMA BEAM AHEAD

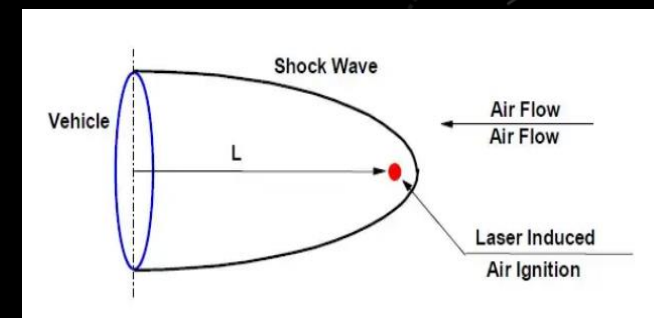
Important Points:

- Stanford claims to have witnessed and photographed a plasma beam ahead effect in 1985
- Stanford notes that the disk-shaped metallic object flew bottom-forward (least aerodynamic)
- Oberth (1954) also notes that disks typically fly bottom-forward



The disks always fly in a manner as if the drive is acting perpendicular to the plane of the disk; when they are suspended over a certain terrain they keep horizontal; when they want to fly very quick, they tilt (tip) and fly with the plane directed forward. In sunlight, which is brighter than their own gleaming, they appear glittering like metal.

- Hermann Oberth 1954



Brazilian Society of Mechanical Sciences
and Engineering

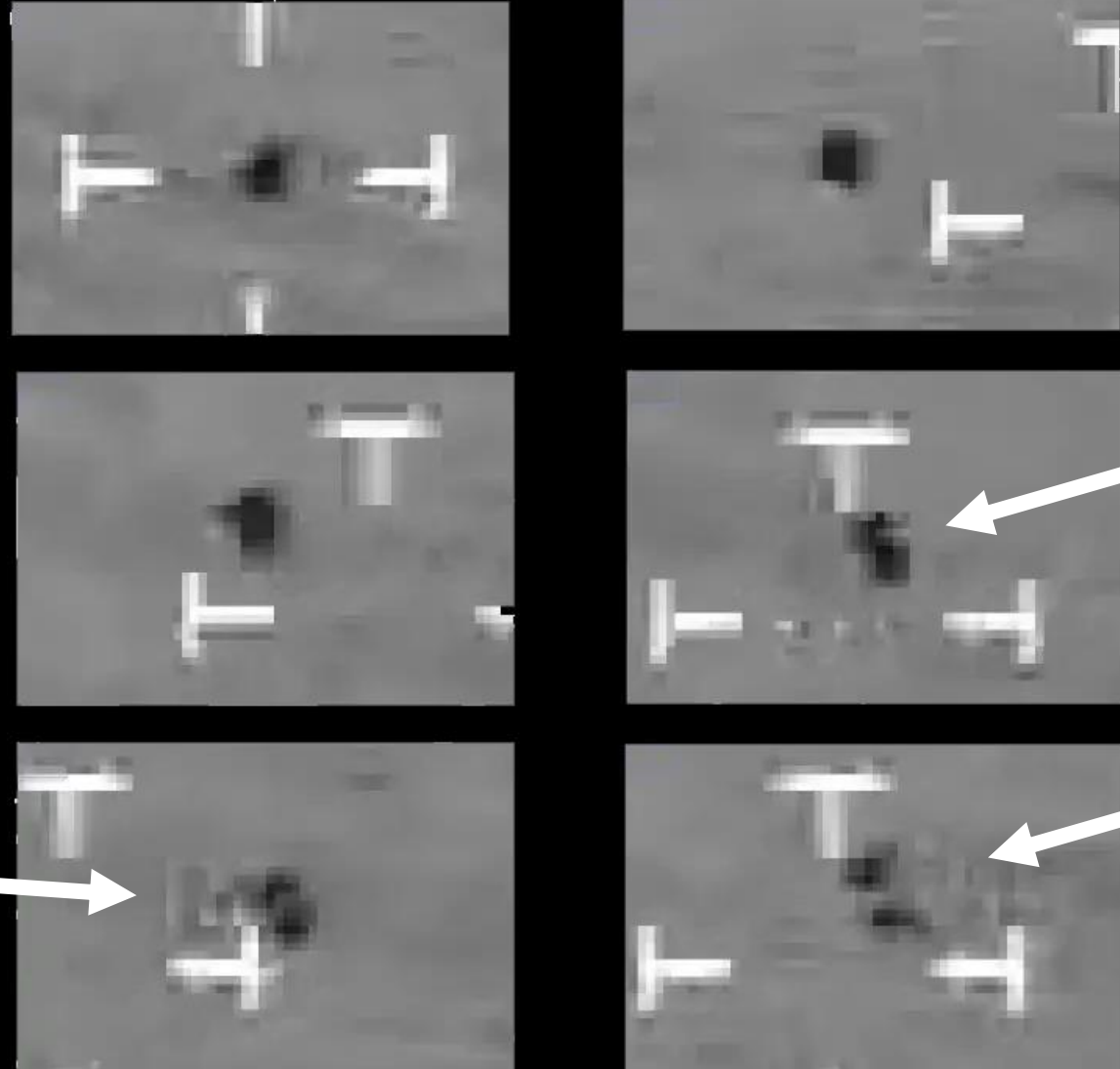
LOW OBSERVABILITY OR CLOAKING

MULTI-IMAGING

Important Points:

- UFOs are often observed to split into multiple objects
- In many cases, this appears to be an optical effect
- Contributes to blurred imagery

US Homeland Security, April 25, 2013, Aguadilla, Puerto Rico

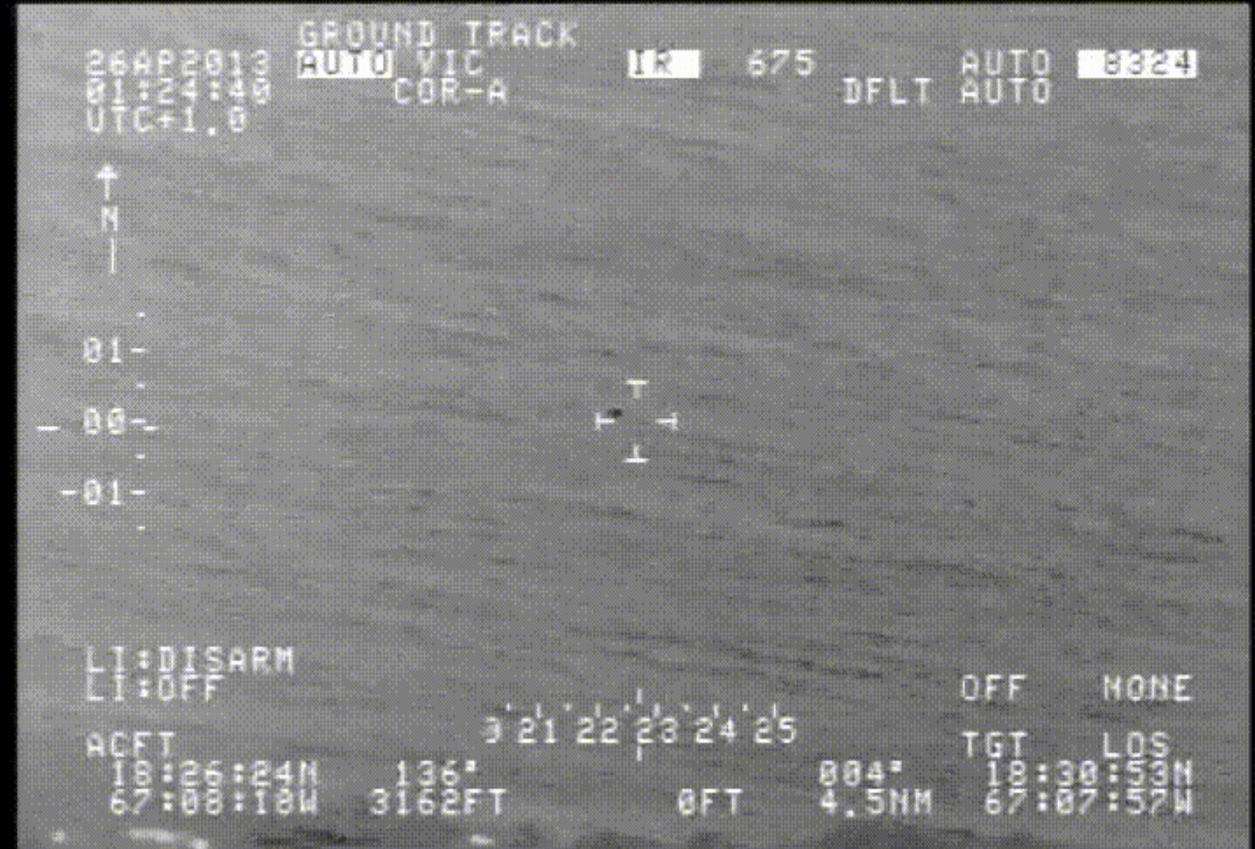


LOW OBSERVABILITY OR CLOAKING

MULTI-IMAGING

Important Points:

- Multi-imaging can be very subtle
- Multiple images can appear and disappear many times a second: Flickering
- Multiple images can be at different orientations from or different views of the object
- Objects can look as if they are dividing or spawning other objects



US Homeland Security, April 25, 2013, Aguadilla, Puerto Rico

LOW OBSERVABILITY OR CLOAKING

DISTORTION FIELD

US Homeland Security, April 25, 2013, Aguadilla, PR

Important Points:

- Objects are surrounded by a volume through which background imagery can be seen to be distorted
- Is this optical refraction due to a varying index of refraction?
- Is this distortion or lensing due to a Gravitational Field???



LOW TEMPERATURE

The FLIR is set so that
HOT OBJECTS are BLACK.

The Go Fast UAP is White

This UAP is colder than its
surroundings

This is unusual for a
machine, which is expected
to dissipate waste heat!

US Navy Go Fast video



HOT OBJECTS are BLACK

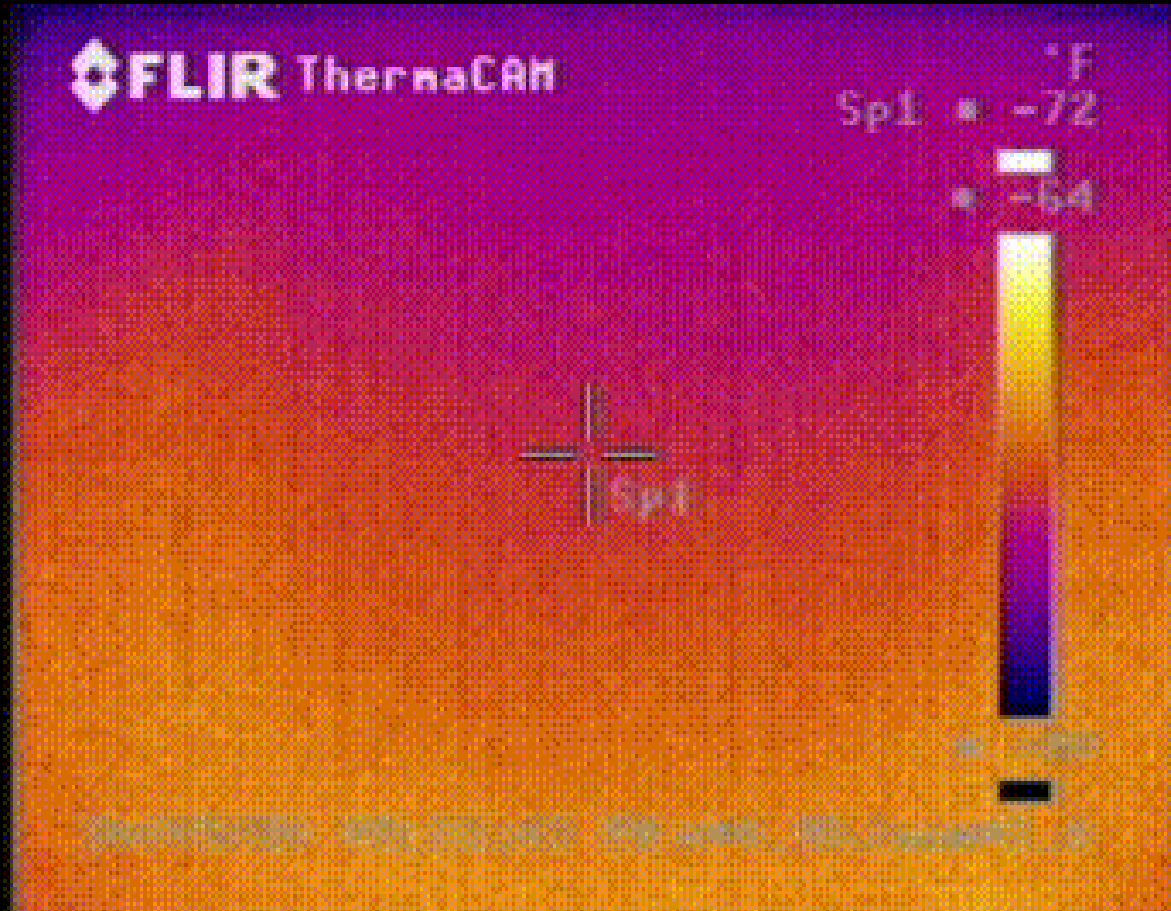


LOW TEMPERATURE

FLIR Camera (ThermaCAM PM695: 7.5 – 13.0 μm) video
of a Trefoil-shaped Craft following a Jet Airplane.

David Mason (UAPx), Sept 30, 2019. Renton Washington, USA

UAPx



The Jet Airplane is clearly hot.

Trefoil was captured in two different cameras. The Trefoil Object/s has a temperature of about -60°F .
Trefoil was ONLY visible in long-wave IR — NOT visible using Night Vision (short-wave IR) !!!

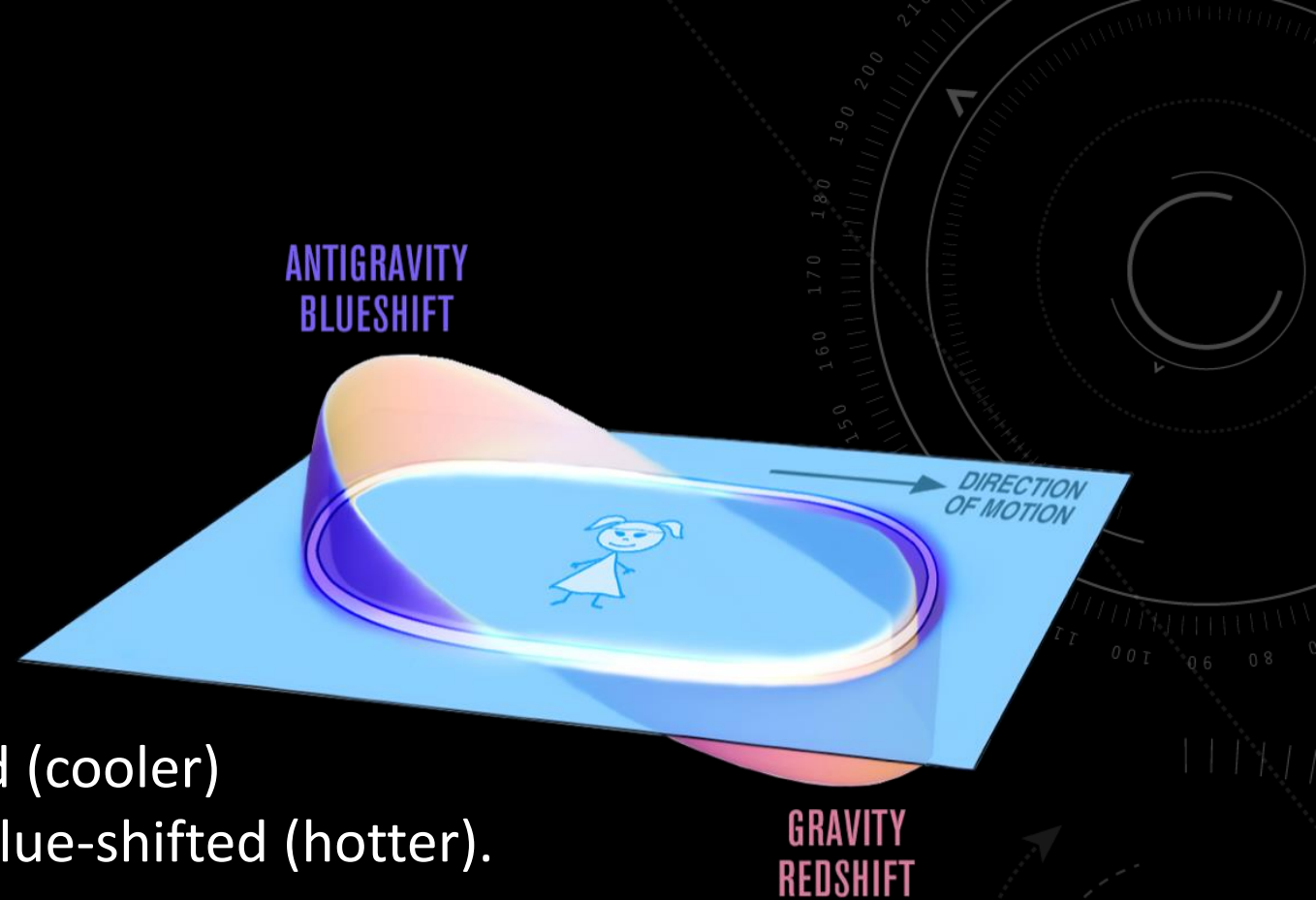
LOW TEMPERATURE IMPLICATIONS

The fact that some UAPs are observed to operate at very low temperatures, argues against the hypothesis that these particular objects are warping spacetime in a manner similar to the Alcubierre metric.

The Front of a moving object is red-shifted (cooler)
The rear of the moving object should be blue-shifted (hotter).

The bottom of a hovering / flying craft ought to be strongly blue-shifted (appear hotter).

Strong blue-shift of thermal blackbody radiation could explain radiation burns in victims during encounters (eg. Cash–Landrum Incident, Texas 1980; Operação Prato, a Brazilian Air Force investigation 1977-1978).



WARP DRIVES?

US Navy Gimbal imagery, 2015

Bobrick and Martire, 2021
Introducing physical warp drives
Class. Quantum Grav. 38 105009 (22pp)

“We show that a class of subluminal, spherically symmetric warp drive spacetimes, at least in principle, can be constructed based on the physical principles known to humanity today”



Ray Stanford, 1985

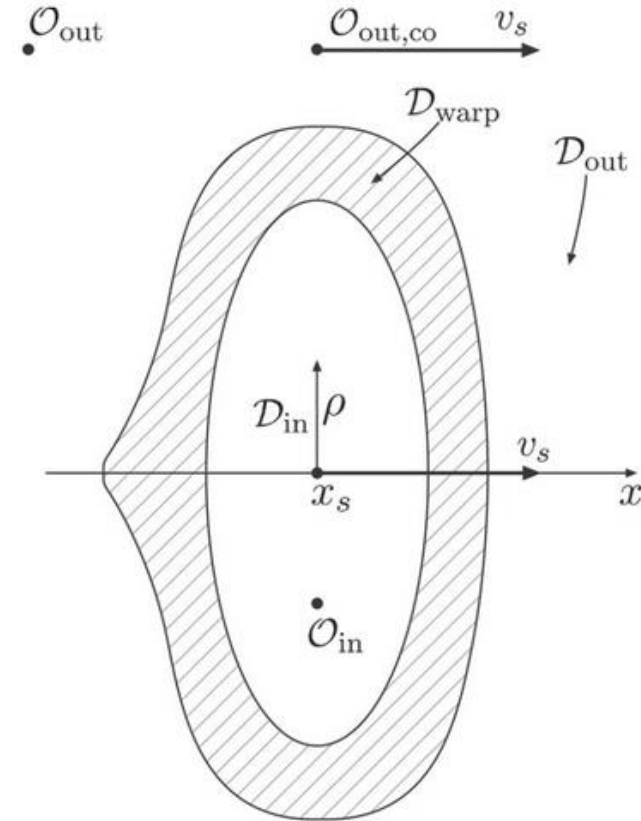


Figure 1. A schematic illustration of a warp-drive spacetime. The spacetime consists of three regions: Asymptotically-flat vacuum background \mathcal{D}_{out} (background), general stationary curved region $\mathcal{D}_{\text{warp}}$ with a spherical topology (the warping region) and a flat inner region \mathcal{D}_{in} (‘passenger’ space). Any such spacetime, including the Alcubierre drive metric, is realised through a shell of ordinary or exotic negative energy density material filling the warping region $\mathcal{D}_{\text{warp}}$. Axis x shows the direction of motion, while ρ is the cylindrical radius. As we discuss in section 4.1, flattened disk-shaped metrics minimise energy requirements of the particular Alcubierre, but not necessarily other, warp drive spacetimes. As we also discuss in section 5, warp drive spacetimes require some form of propulsion in order to accelerate. For this reason, in physical realisations of such spacetimes, the front and rear parts are likely asymmetric.

Bobrick and Martire, 2021
Class. Quantum Grav. 38 105009 (22pp)

STRONG MAGNETIC FIELDS

Important Points:

- UFOs are often associated with strong magnetic fields
- These magnetic fields can adversely affect electronics in airplanes and other vehicles

FIFTY-SIX AIRCRAFT PILOT SIGHTINGS INVOLVING ELECTROMAGNETIC EFFECTS

Richard F. Haines, Ph.D.

Copyright 1992

ABSTRACT

Reports of anomalous aerial objects (AAO) appearing in the atmosphere continue to be made by pilots of almost every airline and air force of the world in addition to private and experimental test pilots. This paper presents a review of 56 reports of AAO in which electromagnetic effects (E-M) take place on-board the aircraft when the phenomenon is located nearby but not before it appeared or after it had departed. These effects are not related to the altitude or airspeed of the aircraft. The average duration of these sightings was 17.5 minutes in the 37 cases in which duration was noted. There were between one and 40 eye witnesses (average = 2.71) on the aircraft. Reported E-M effects included radio interference or total failure, radar contact with and without simultaneous visual contact, magnetic and/or gyro-compass deviations, automatic direction finder failure or interference, engine stopping or interruption, dimming cabin lights, transponder failure, and military aircraft weapon system failure. There appears to be a reduction of the E-M energy effect with the square of increasing distance to the AAO. These events and their relationships are discussed. This area of research should be concentrated on by other investigators because of the wealth of information it yields and the physical nature of AAO including wavelength/frequency and power density emissions.

CONCLUSIONS

Some of these UAPs appear to be ANOMALOUS PHYSICAL OBJECTS exhibiting numerous observable physical effects

It should not be assumed that they are the same type of thing.
If they are craft, it cannot be assumed that they all have the same origin, characteristics, or exhibit the same technologies.

Potentially a diversity of technologies exists to match the diversity of objects

UAPX is actively studying these objects.

[HTTP://UAPEXPEDITION.ORG](http://UAPEXPEDITION.ORG)

The Physical Observables

1. Propulsion mechanisms do not produce waste heat
2. UAPs can withstand extremely high accelerations
3. Minimal interaction with the surrounding medium (air, water).
What about solids??
4. Optically Distorted (difficult to obtain clear images)
 - a. Low-Observability or Cloaking (Nearly Invisible)
 - b. Plasma Sheath
 - c. Distortion Field (Refraction? Gravitational Lensing?)
 - d. Multi-Imaging
5. Extremely Low-Temperatures ($\approx -60^{\circ} F$)
 - a. No obvious waste heat
6. Extremely Strong Magnetic Fields
 - a. EM interference with conventional electronics
 - b. Faraday Rings (interference with polarized light)