

Technical Commission 3AF- SIGMA 2



Les Phénomènes Aérospatiaux Non Identifiés à l'IHEDN

GBA (2S) JM André, IGA (2S) P. Bescond, A. Juillet, GBA (2S) B. Mignot

Luc Dini- 3AF SIGMA2 Président de la CT 3AF SIGMA2

<https://www.3af.fr/commission-technique/sigma>



Association Aéronautique
et Astronautique de France

3AF & SIGMA2



France Aeronautical & Astronautical Association (3AF) was founded in 1947.

It has about 1500 members as well as collective members including institutions such as CNES (French Space Agency), DGA (Ministry of Defense “Direction générale pour l’armement”) and DGAC (“Direction de l’aviation civile”) as well as Engineering post academic schools.

3AF is a technical society which organizes scientific symposia such as space propulsion, green aviation, integrated air and missile defense. It also leads aerodynamics, commercial aviation, light air machines et machines, skills and training, drones, environment, flight tests, space observation and exploration, helicopters, history, economic intelligence and strategy, materials, missiles, IP, aero and space propulsion, Sigma 2 (UAP), strategy and international affairs, structures, optronics systems, space transportation.

SIGMA2 Technical commission of the 3AF society is composed of expert members who bring their experience and know-how in diversified fields of expertise : engineers, academics, radiation specialists, former pilots and former career officers, astronauts, doctors, psychologists...

For many years, the work of the SIGMA 2 Technical commission has focused on the study of the observation and physics of Unidentified Aerospace Phenomena (in French: “Phénomènes aériens non identifiés” = PAN).

Some of the work performed by SIGMA 2 contributes to the expertise carried out by CNES/GEIPAN through the GEIPAN College of Experts.

The research conducted by SIGMA 2 experts is based on various sources of information, with a particular interest in cases observed an occurred in France or abroad, which allow the study of data or materials contributing to a better understanding of the phenomena.

SIGMA2: a collaborative and multi disciplinary approach to study UAP



- **Aknowledgments**
- **Introduction to 3AF SIGMA2 : from “MOC to UAP” and GEIPAN, SIGMA2**
- **International situation**
- **What is UAP physical observables approach by SIGMA2**
- **Optical and EM observables: plasma multi phenomena, multi frequency observation**

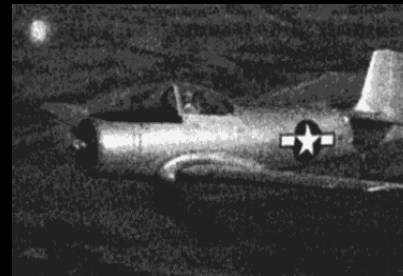
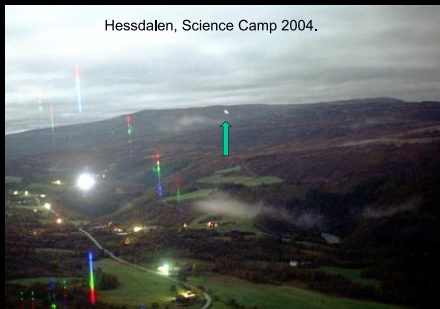
UAPs, what do they look like?



How to discriminate UFO/ UAP from atmospheric phenomena?

Optical observable can be diverse between UAPs and can vary quickly during an observation (punctual to a shape, several objects fuzzing, changing of shape, ovoid to dart...change of colour, of radiation intensity, slow, floating, moving or stationary, sudden acceleration).

There are also other physical observables in EM spectrum, radar signatures, EM transmission including microwaves, accoustical etc... Interaction between UAP and the environment is also worth studying it.



“luminous spheres” “plasmoid”, single or group: high velocity/acceleration - change of group geometry-

Hessadalen- Foo Fighter

Can be confused with ball lightning in some cases

Instruction concernant l'établissement et la transmission des comptes-rendus relatifs aux Mystérieux Objets Célestes (M. O. C.)

Secrétariat d'Etat à l'Air, n° 267/EMFA/A/BS/DR

Paris, le 22 octobre 1954

A de nombreuses reprises la presse a signalé que des objets mystérieux - habituellement baptisés "Soucoupes Volantes" - étaient apparus au-dessus de la France, avaient survolé des agglomérations, des installations militaires ou des bases aériennes, et parfois atterri en campagne. Quelques-uns de ces apparitions ont même donné lieu à des rapports officiels.

En général, la description très vague des faits observés et le manque de détails essentiels sur les circonstances de l'observation ne permettent pas de se prononcer après coup sur la réalité des objets vus ni sur leur origine.

La plupart des phénomènes signalés par les témoins de bonne foi paraissent dûs soit à des objets connus, mais vus dans des conditions anormales, soit à des effets d'optique ou d'électricité atmosphérique. Telle sont, d'ailleurs, les conclusions d'une enquête de l'US Air Force sur les cas observés aux Etats-Unis et l'opinion de nombreux savants français ou étrangers.

Un certain nombre de faits sont cependant restés inexpliqués, faute de renseignements suffisants, et cette situation peut se reproduire. Il importe donc, tout en évitant de créer ou d'entretenir une émotion injustifiée, de rassembler le maximum d'informations sincères et précises sur les apparitions éventuelles. L'Armée de l'Air peut et doit apporter sa contribution à une appréciation objective des faits.

A cette fin, les Grands Commandements demanderont aux Commandants des bases et formations de l'Armée de l'Air placées sous leurs ordres de bien vouloir, lorsqu'un mystérieux objet céleste leur sera signalé :

Mystérieux Objets Célestes (MOC) en France: faire établir par les témoins, militaires ou civils, un compte-rendu objectif et détaillé, transmettre ce compte-rendu, revêtu de leur avis, directement à l'Etat-Major (Bureau Scientifique) sous le présent timbre.

Le Général de Corps Aérien GELEE
Major Général de l'Armée de l'Air
/GELEE/

Pour ampliation
directive ministérielle 267

Pan in France: 1954 directive ministérielle On MOC (historical UAP cases files)



101/20 - 31.12.57 -

3° RÉGION AÉRIENNE 667

N° 1 - 10 / E. M. / 3/366 / DR

3° R. A.

Clt:

BORDEAUX, le 2 JANV 1958

Le GÉNÉRAL [redacted]

Commandant la 3° Région Aérienne

à Monsieur le Secrétaire d'Etat à l'Air
Etat-Major de l'Armée de l'Air
Bureau Scientifique - PARIS -

Vu par le Directeur du Cabinet

SA 4.6

BORDEREAU D'ENVOI

DÉSIGNATION DES PIÈCES	NOMBRE	OBSERVATIONS
- Comptes-rendus du Sous-Lieutenant [redacted] et du Sergent [redacted] du Contrôle Local Aérien de la B.A. 135 COGNAC, relatifs à 1 ^{re} observation de Mystérieux Objets célestes.....	2	<u>TRANSMIS CONFORMEMENT</u> aux dispositions de l'instruction N° 1267/EMFA/L/BS/DR en date du 22 Octobre 1954

P.D. Le Sous-chef d'ETAT-MAJOR

Courrier Général EMFA/AIR

1	2	3	4	5	B.P.L. B.P.M.
1	2	3	4	5	B.P.L. B.P.M.
1	2	3	4	5	B.P.L. B.P.M.
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1	2	3	4	5	B.P.L. B.P.M.
1	2	3	4	5	B.P.L. B.P.M.
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1	2	3	4	5	B.P.L. B.P.M.

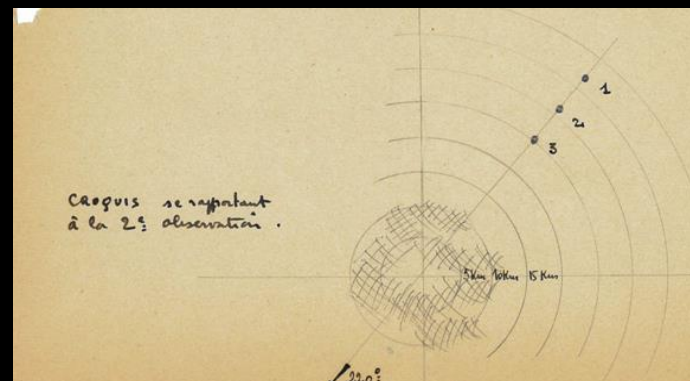
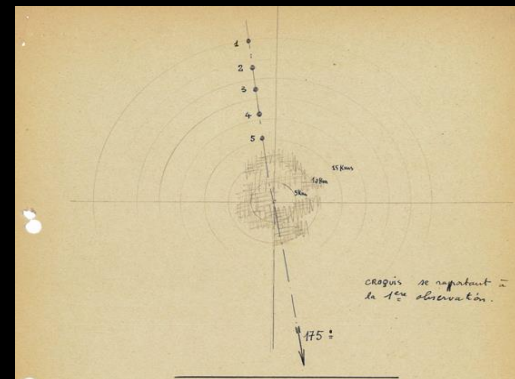
ANSMIS le 6 JANV 1958

4 JANV 1958

N° 22/DR

15.6

15.6





3AF/ SIGMA2 round table

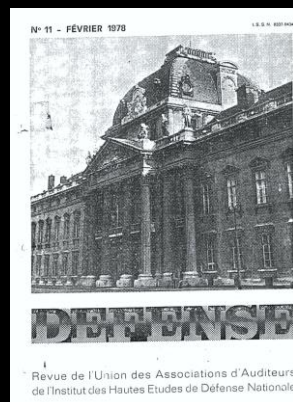
Statement on UAP

A long standing history iwth contrbution of Defense institutes

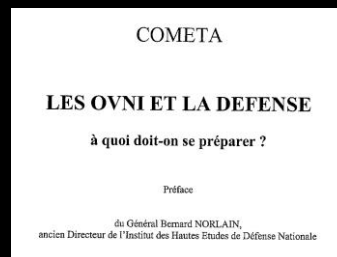
Ans scentific societies



IHEDN



IHEDN



**Instruction concernant l'établissement
et la transmission des comptes-rendus
relatifs aux Mystérieux Objets Célestes
(M. O. C.)**

Secrétariat d'Etat à l'Air, n° 267/EMFA/ABS/DR

Paris, le 22 octobre 1954

Robert Galley
Ministre de la Défense
(Itw by JC Bourret)



Commission UAP
Then SIGMA, SIGMA2

1951-54

Feb 1974

1977

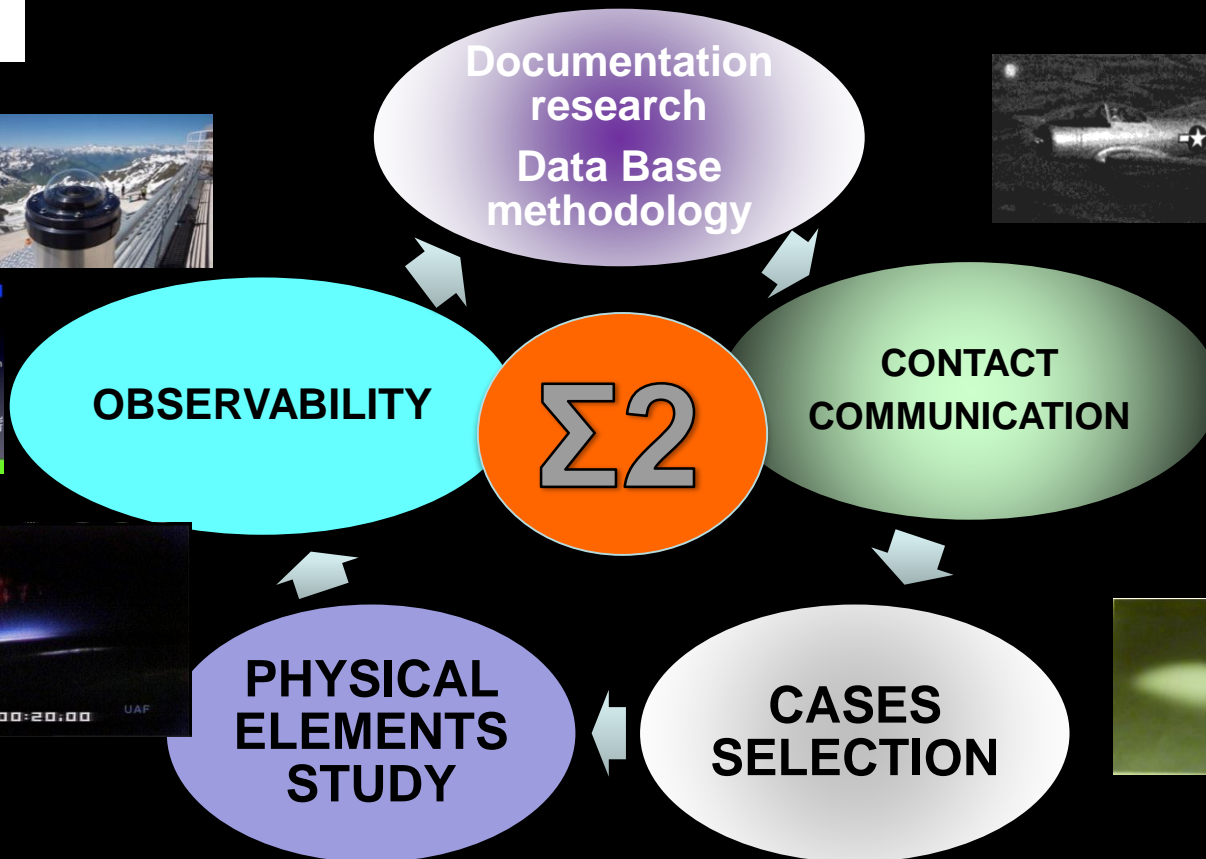
1978

1999

2008/ 2013

GEPA
1960...70s
LDL

3AF SIGMA2
(créée en 2008- CT PAN)

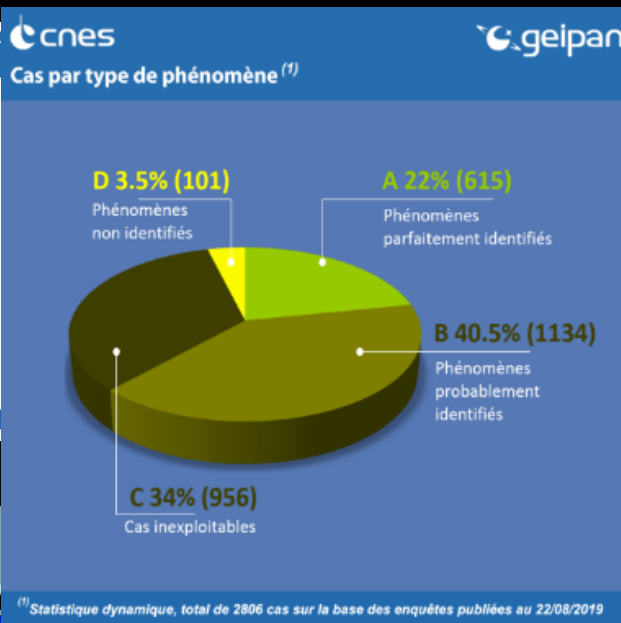
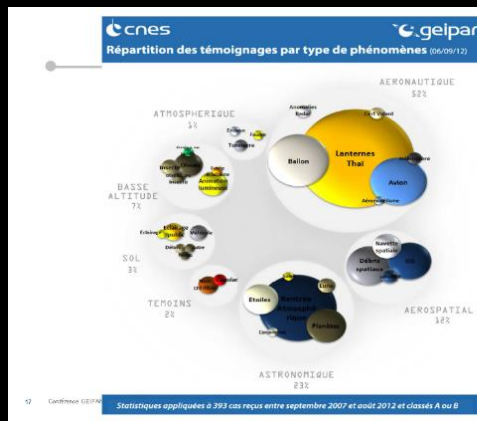


SIGMA2 is a group of multi disciplinary experts (pilots, astronaut, engineers in missiles, air defense, optronics, radar, EM, ball lightning, directed energy physicists) gathered in a scientific society to study UAP cases



Association Aéronautique
et Astronautique de France

SIGMA2 IS COMPLEMENTARY TO GEIPAN



GEIPAN
(created in 1977)

Gendarmerie
Armée de l'Air

Foreign Cases

D CASES SELECTION

PHYSICS ELEMENTS

OBSERVABILITY APPROACH &
IMPROVEMENT

CASES INVESTIGATION RECOMMENDATION

Report

$\Sigma 2$

SIGMA2 collaboration with societies/ institutions



Association Aéronautique
et Astronautique de France

CNES GEIPAN (France)

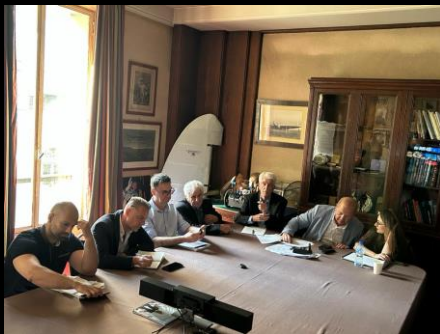
CEFAA (Chili)

NARCAP US

- Laboratoire de recherche sur la Foudre (France)
- IMCCE (Observatoire de Paris- Institut working on meteorid)
- SCU (US)
- Others to come : SUAPS, AIAA,...
- Webinar 1 on UAP Optical observables (SCU, SUAPS, VASCO, UAPx, Gallieo, Hessdallen project,...) June 2023



GEIPAN international colloque
CAIPAN 2- SIGMA2 experts (Toulouse 2022)



3AF SIGMA2 Webinar 1 on UAP optical observables
(June 2023, Paris aeroclub de France)

Table ronde a 3AF avec C. Mellon- Dr J. Vallee
A.Juillet le 3 Nov
UAP:environnement international et US

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TOULOUSE, LE 15 FEV. 1980

N° - 050 CT/GEPA

NOTE D'INFORMATION N°1

*Observations de phénomènes atmosphériques
anormaux en URSS*

- Analyse statistique -

(MM. GUINDILIS, MENKOV & PETROVSKAIA)



GROUPE D'ETUDES
DES PHÉNOMÈNES AÉROSPATIAUX NON IDENTIFIÉS

Paris, le 3 février 1983

Messieurs,

Faisant suite à votre demande nous voudrions porter à votre connaissance que des organismes scientifiques de l'Académie des Sciences de l'URSS sont engagés dans les études des phénomènes aérospatiaux anormaux.

Les orientations principales des études de ces phénomènes sont analogues à celles menées en France et évoquées dans votre lettre.

Si la partie française est intéressée à coopérer dans ce domaine, le Département des Relations Extérieures de l'Académie des Sciences de l'URSS pourrait désigner en tant que partenaire du côté soviétique l'Institut du magnétisme de Terre, de l'ionosphère et de la propagation des ondes de l'Académie des Sciences (IZMIRAN) dirigé par le membre-correspondant de l'Académie des Sciences M. Migouline V.V.

L'adresse de l'Institut est suivante:

I42092, г.Троицк, Московская обл., Институт земного магнетизма, ионосферы и распространения радиоволн (ИЗМИРАН), Мигулину В.В.

Veuillez agréer, Messieurs, l'expression de nos considérations distinguées.

Ben

V. NITCHKOV
I Secrétaire de l'Ambassade
de l'URSS en France

“Setka MO” (Ministère de la défense): “Recherche sur les phénomènes paranormaux atmosphériques et spatiaux et leur influence sur les opérations des matériels et personnels militaires

“Setka AS” (Academy of Sciences): “Programme de recherche sur la physique de s phénomènes paranormaux atomesphériques et spatiaux”

An aerial photograph of a coastline, likely the Chesapeake Bay area, showing a mix of blue water, green land, and brownish terrain. A semi-transparent white rectangular box is centered over the image, containing the title and subtitle text.

The 'NIMITZ' Case

Forensic analysis of US Navy CSG 11's
Encounter with AAV

- STORYBOARD -

14th November 2004



USS Nimitz
Nuclear Aircraft Carrier



USS Princeton
Missile Cruiser



VMFA-232
F/A-18C 'Hornet'



VFA-41
F/A-18F 'Super Hornet'



VAW-117
E-2 Hawkeye EW aircraft

San Diego



CSG 11





Alt: 80,000ft
V: 100 kts

San Diego

Nov-10-13, 2004 : Pre-event Information

USS Princeton's SPY-1 radar officer detect several waves of 8-20 UFOs spotted over Catalina Islands and travelled south at 80,000 ft at about 100 kts.

Notice confirmed by USS Nimitz and AN/APS-145 radar of the E-2 Hawkeye.

UFOs disappears.

No action taken.



CSG 11



Nov 14th, 2004 : Decision To Intercept
11:00AM to 01:00PM

Skies : Clear
Wind : No
Water : Very calm

Again, USS Princeton's SPY-1 radar and USS Nimitz detect 14 UFOs, spread out uniformly across 100 miles, and navigating from 28,000ft to 500ft in very fast variations. E-2 Hawkeye detect only the nearest one.

All radars' data were combined by CEC into one picture

As an Air Defence exercise involving many aircrafts is scheduled in zone soon, authorization to intercept the closest target is given to USS Princeton



Alt: 80,000ft
V: 100 kts

Alt: 28,000ft

Alt: <500ft

San Diego



CSG 11



Nov 14th, 2004 : F/A-18C First Jet To Investigate
~02:00PM

Exact location of UFO is unknown but it was within 60 miles of the USS Nimitz

Lt. Colonel Douglas Kurth's F/A-18C, already in flight was first in target.
But no contact : Kurth only saw a 50-100m circular area of 'white water' before mission aborted.

Two F/A-18Fs of the first wave of the Air Defence Exercise are approaching target

San Diego



Water disturbance



CSG 11



Nov 14th, 2004 : F/A-18Fs Encounter the UFO
02:10PM to 02:40PM

San Diego

'Super Hornets' proceed with onboard APG-73 radar set to 20miles in all directions with no success to detect object.

Vectored by USS Princeton, F/1-18Fs go to Combat Air Patrol Coordinates

CSG 11



Nov 14th, 2004 : F/A-18Fs Encounter the UFO

02:10PM to 02:40PM

F/A-18 Leader decides to investigate and descend towards object.

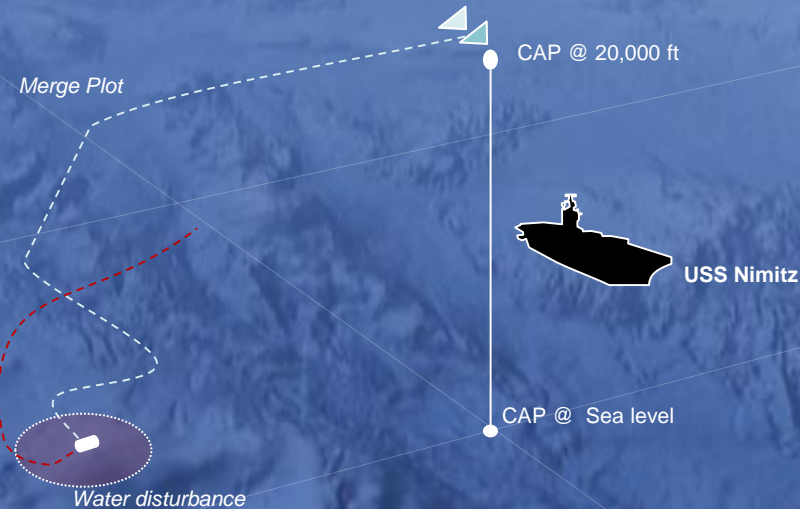
The 'Tic-Tac' starts then to move from the disturbance, mirroring the jet movements.

As the Leader is descending, the Tic-Tac is ascending toward the nine o'clock position

The object shoots up across Jet nose and instantaneously heads south : F/A-18Fs no longer see the object and the disturbance.

Less than a couple of minutes later, as F/A-18Fs decide to return to the CAP point, USS Princeton notifies them that the object is already exactly on it, 60NM farther.

San Diego



Nov 14th, 2004 : USS Princeton's View
02:10PM to 02:40PM

The F/A-18F Leader engagement of the 'Tic-Tac', was monitored by the USS Princeton in real-time.

When the object shoots up across the Jet nose, the other targets on the USS Princeton's radar screen drop from altitude towards ocean.

San Diego

CSG 11



Nov 14th, 2004 : IR Video evidence
04:20PM

Under the control of the E-2 Hawkeye radar, two F/A-18Fs from the third wave of the Air Defence exercise came to the south of the CAP point, where the 'Tic-Tac' was last seen.

One of the F/A-18Fs picked up a radar contact in the RWS scan mode at about 33miles to its south.

The E-2 Hawkeye attempted to lock it several times without success and with no evidence of jamming.

But an IR video of the event was recorded by the ATFLIR pod of the F/A-18F

San Diego



CSG 11



<https://coi.tothestarsacademy.com/gimbal/>

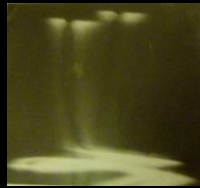
RAYTHEON AN/ASQ-228 ATFLIR POD DISPLAY INFORMATION



Several remarks about this video:

- As the carrier is turning, the cloud background scrolls across the image, but the object remains very stable.
- "Rotation" of the object takes place when the bearing is between 5°L and 5°R, while the aspect angle of the object has remained stable between 54°L and 10°L.
- Rotation is done in jerks which are visible on the structures of the image (clouds).
- Tracking is faulted in the last seconds of the video, but the object remains within the field of the tracker.

One would like to see the optical combination of the pod and in particular, know if it has an optical re-rotation module (bearing pointing by a mirror at the head, hence rotation of the image around 0°). This could explain the abrupt rotation of the object at zero bearing, which could simply be due to a fault in the pod.



UAP are real phenomena with remarkable observables collected around the world

Visible and Optical sightings- radar observation

EM radiation- EM effects- Physical effects on human being and environment .

More recently IR sensors have been used to collect **thermal images of alleged UAP**

Some nations reactivated their investigation structures on UAP recently: US change of posture

- USA: had a classified program (AATIP, AASWG)unveiled in 2017- apparent change of posture
- Whistle blowers and pressure from Congress on Pentagon and IC
- A structure is created inside Pentagon (UAP task Force then AARO) 2020-2022 who published 4 reports but no real cases description (last one in March 24)- no available technical reports – complex organization.
- NASA conducted an undependant study (report issued on 14 september 2023)
- Japan UAP Task force in 2020
- Canada (sceintific report on its way?)
- Audition by European parlement pilots and scientists on UAP lead by Portugese euro deputy Gerreiro (March 24th)

International scientific and academic experts starts physical approach of UAP

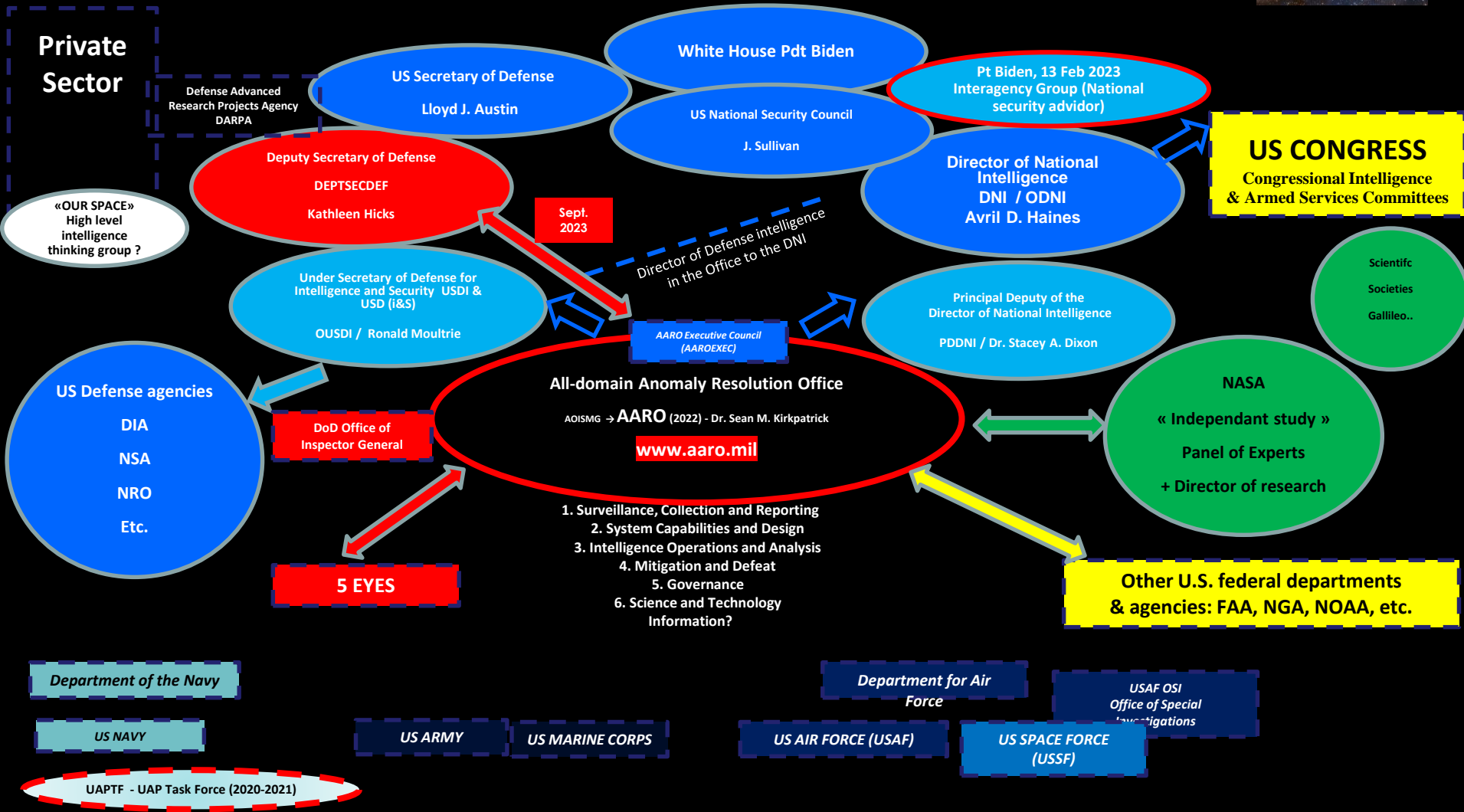
(Galileo, 3AF SIGMA2, NOVALEM ANALYTICS, LLC, SCU / Scientific Coalition for UAP Studies, Limina / Society for UAP studies, Vasco project team): agreement, webinar, joint analysis happened

But physical data and technical reports on UAP consistent cases are missing.

In France a structure is in place since 1977, GEIPAN with two tasks : conduct investigation of cases submitted by french cittizen with support of gendarmerie nationale and french air force in some cases then publsih reports some with details (see report on Air France flight, Trans en Provence etc).

3AF SIGMA2 is complementary of GEIPAN and contributes to GEIPAN expert college.

A complex synchronization: What's cooking?





Association Aéronautique
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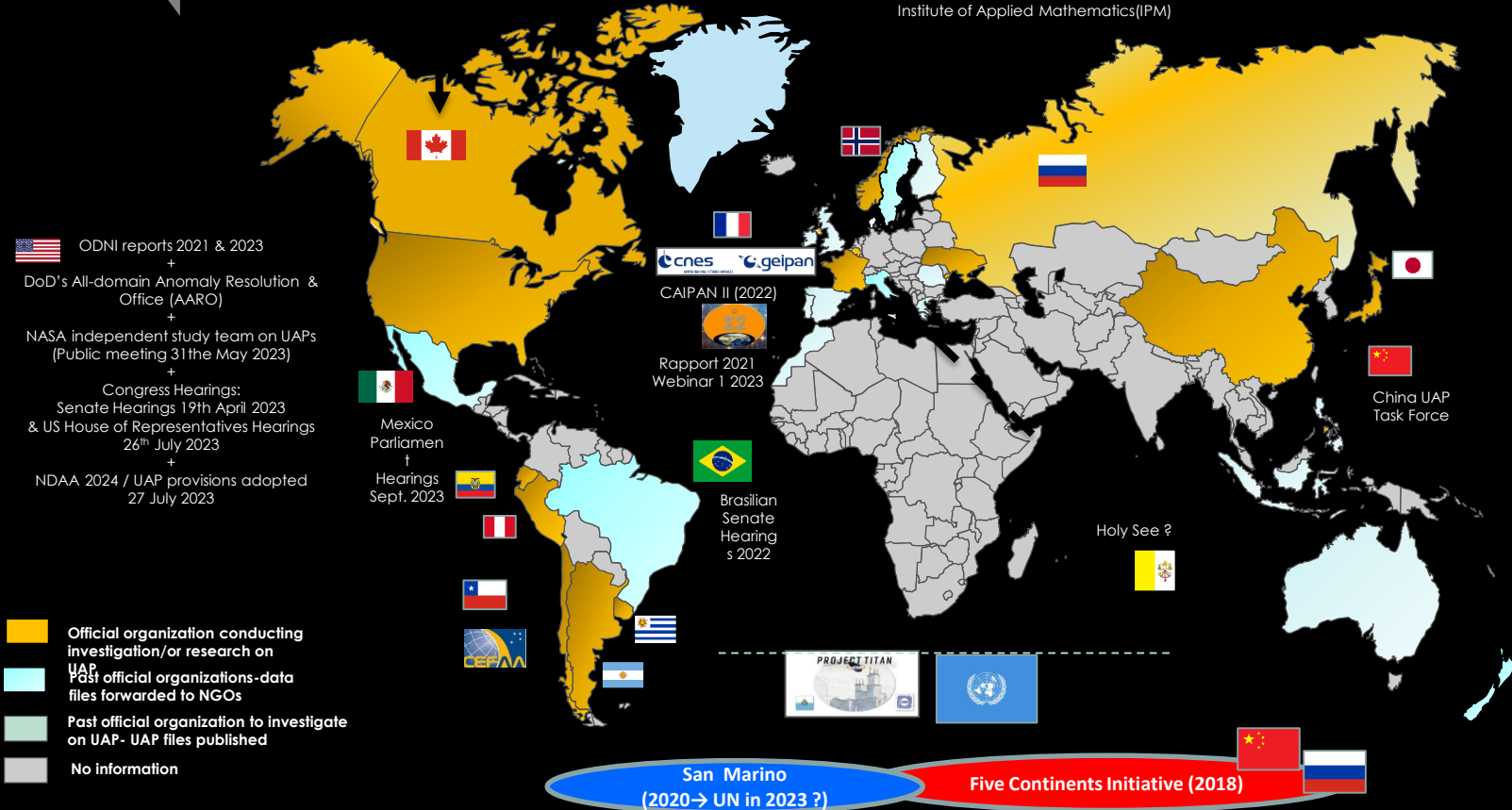
UAP: « Official studies » international affairs (sept. 2023)



Projet Sky Canada

Academy of sciences

Institute of Applied Mathematics(IPM)

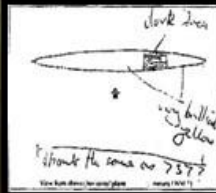
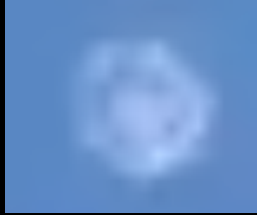


SIGMA2: a collaborative and multi disciplinary approach to study UAP



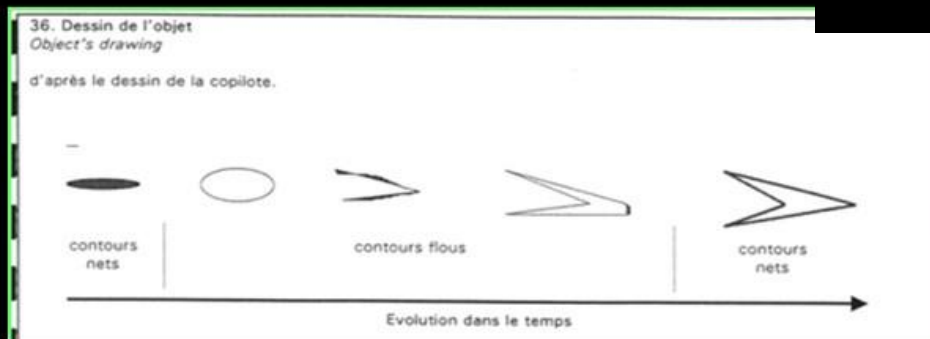
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UAPs shapes



Discrete localized phenomena (orange point), then lenticular or ovoid, bright silver disk (many forms), multiple colors intense flashes even in stationary position – increase of intensity before moving...

Variable phenomena



Change of geometric shape (disc-arrows), blurring effect on the side, static or slow, rectilinear or oscillating movement, sudden accelerations with angles at 90 degrees, reversal, silence or emission of crackling, ultrasound, change of appearance (bright, metallic), change in color and intensity...

IR observations:



Difficult interpretation, requiring other observations, in particular radar to remove the ambiguities on the distance (case of a drone? case of an airplane, questions about possible masks along LOS)

UAP observables reported : any link with plasma?

Plasma source of light or consequence



**Optical light glow effect (single, multiple in group)
(blue, white, color change)**

RB47, Teheran, Lakeneath, 05/11/90 case...

Apparent shape shifting

MW EM waves pulsed transmission

1-3 GHz, 9 GHz records

Large RCS ("707" RCS or low RCS observable/
Instantaneous disappearance of radar plot

Pulsed active EM transmission from UAP sometimes
Russian case, Teheran case

RB47 (US) 3 GHz, 1 μ s, 600 Hz, B52 (Malmstrom)

B52 SAC crews required to record EM signals at 3 GHz

Low to no interaction with environment

Air, water... MHD like?

To compare to MHD EM energy effect on airflow

Plasma?

**Hovering to hypervelocity
Strong acceleration**

Low inertia appearance

**MW Pulse Effects on electronics
Similar to EM weapons
Eg Teheran case (1976)**

**MW EME Effects human
"heating" burning effect: skin, eye: UV
Acoustical effect (infrasound, low
frequency)- cerebral and memory
Similar to EM Weapons**

MW Effects on environment: vegetation

**MW High Energy deposit effects on atmosphere
(striation)**

Petrozadvosk (Russia)

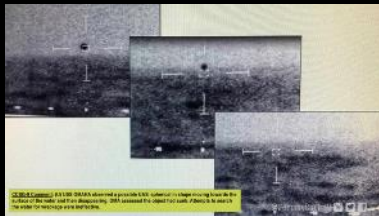
"similar to nuclear radiation induced effect (X, gamma rays)

or artificial stimulation on atmosphere or sprites

Green balls close to US atmospheric tests, Madagascar case...

US experimentation with electrons guns in the 80s to stimulate

Atmosphere radiation under energy beam



US AARO depicts some UAP characteristics



TYPICALLY-REPORTED UAP CHARACTERISTICS

Appearance	Morphology	Round
	Size	1-4 meters
	Color	White, Silver, Translucent
Performance	Altitude	10K – 30K feet
	Velocity	Stationary to Mach 2
Signatures	Propulsion	No thermal exhaust detected
	Radar	Intermittent, X-Band (8-12 GHz)
	Radio	1-3 GHz, 8-12 GHz
	Thermal	Intermittent, Shortwave Infrared, Medium Wave Infrared



Middle East Object
Footage taken by an MQ-9 of an apparent silver, orb-like object in the Middle East. Due to limited data, the object remains unidentified.

The appearance of U.S. Department of Defense (DoD) visual information does not imply or constitute DoD endorsement.

https://d34w7g4gy10iej.cloudfront.net/video/2304/DOD_109584445/DOD_109584445.mp4



South Asian Object (Image 1)

Footage taken by an MQ-9 of an unidentified object in South Asia with an apparent atmospheric wake or cavitation, later assessed as a likely commercial aircraft by the All-domain Anomaly Resolution Office. The cavitation is likely a sensor artifact resulting from video compression.

Reporting UAPs

Military personnel should report through their command or service in accordance with GENADMIN Joint Staff J3 Washington DC 191452ZMAY23 "Unidentified Anomalous Phenomena Reporting and Material Disposition."

Civilian pilots are encouraged to promptly report UAP sightings to air traffic control. AARO receives UAP-related Pilot Reports (PIREPs) from the Federal Aviation Administration.

https://www.aaro.mil/Portals/136/PDFs/Latest_UAP_Reporting_Trends_Presentation.pdf?ver=2ZJZ6Bg4hNpjiBIRzC-VjA%3d%3d

Natural Phenomena (ball lightning family)



Ball lightning (from NARCAP TR-7, 2002)
www.narcap.org



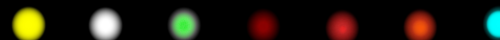
TPOLOGIE VISUELLE DE LA FOUDRE EN BOULE

Basée sur 406 observations entre 1994 et 2020



Cette typologie des différentes catégories de la foudre en boule présente des reproductions fidèles des apparences visuelles du phénomène observées par les témoins. Elle n'est pas exhaustive, étant susceptible d'évoluer en fonction des observations rapportées.

I - LA FOUDRE EN BOULE



La foudre en boule est caractérisée par l'apparition d'un phénomène lumineux durant un orage, simultanément à un coup de foudre ou quelques secondes plus tard. Plusieurs autres critères sont nécessaires comme la forme qui doit être sphérique, la taille qui ne doit pas excéder cinquante centimètres, une durée de vie assez courte avec un maximum de 30 secondes et l'altitude d'évolution qui doit être comprise entre le sol et cinq mètres de hauteur. Le météore lumineux peut être statique ou mobile, son déplacement est la plupart du temps relativement rapide.

II - LA FOUDRE GLOBULAIRE



La foudre globale est caractérisée par l'apparition d'un phénomène lumineux lors d'un orage ou durant une ambiance orageuse (temps lourd, éclairs ou tonnerre sporadiques...) ou en présence d'intenses champs électriques ou magnétiques naturels. Le point déterminant de caractérisation est l'aspect visuel qui n'est pas forcément sphérique, mais peut changer de forme ou comporter des algues, cela inclut des changements de dimensions et d'apparences durant son évolution. La durée de vie peut varier de quelques secondes à plusieurs minutes (exceptionnellement plusieurs dizaines de minutes), le météore lumineux peut être statique ou se déplacer sur des distances allant de quelques dizaines de mètres à des distances bien plus importantes, de l'ordre de plusieurs centaines de mètres. La taille peut varier de quelques dizaines de centimètres à plusieurs mètres, et son altitude d'évolution peut aller du niveau du sol à plusieurs centaines de mètres de hauteur. Des changements d'altitude ou des rebonds sur le sol sont régulièrement observés.

III - LE P.L.O.T

Phénomène Lumineux Orageux Transitoire



Le P.L.O.T ou Phénomène Lumineux Orageux Transitoire est caractérisé par un phénomène lumineux atmosphérique de dimensions et d'apparences très variables qui se produit soit par temps orageux, soit en dehors de l'enveloppe d'un orage actif soit par beau temps ou bien lors de champs électriques, magnétiques, électromagnétiques ou électrostatiques très élevés. Des phénomènes de ce type sont observés avant, durant, ou après les séismes, plus rarement dans le panache d'une éruption volcanique lorsque des décharges électriques viennent à se produire. Le P.L.O.T peut avoir des phases statiques sur une partie de sa durée de vie comprise entre quelques secondes et plusieurs minutes ou de sa trajectoire. Observable à toutes les altitudes, du sol jusqu'à la tropopause.

© Laboratoire de Recherche sur la Foudre
www.lrf.fr
Version 1.0 - 2020

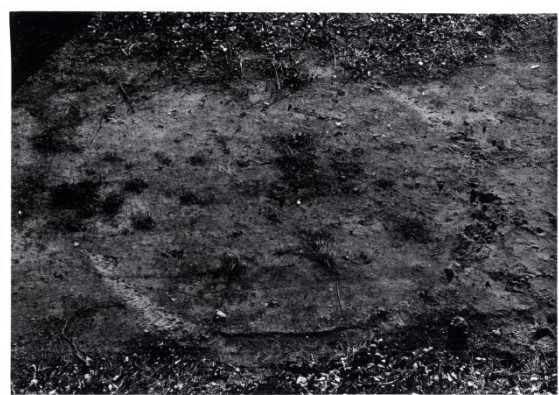
Specific analysis of ball lightning and similar phenomena- Preliminary conclusion (SIGMA2 Progress report 2021)

PLOT (Phénomène Lumineux Transitoire Orageux) / Ball lightning can show different luminous features, spherical, flying in altitude, might reach sound speed, in group or single
No sudden change of direction, no stationary flight- not supersonic
Different analysis including from UK MoD analysis favoring plasmoid as a possible conclusion/explanation for UAP.

UAP: ground and vegetation tracks (Cas Geipan Trans en Provence: 09/01/1981)



Photos origine Wikipedia



EME MW effects on the ground and vegetation
Ageing and drying of grass proportionally to the
range to center

Les différences d'équipement pigmentaire inhérentes au vieillissement (abaissement des chlorophylles, augmentation des xanthophylles) déjà observés chez l'orge (BOUNIAS, Thèse 1972) se retrouvent ici sans équivoque dans les échantillons prélevés à 20 m.

Les échantillons provenant de la **périphérie (d=1,5m)** montrent un **affaiblissement** général des teneurs pigmentaires. Quel que soit l'âge des feuilles, les chlorophylles A sont abaissées de **33%**, les chlorophylles B de **28%** et la phéophytine de 31% : ces trois valeurs montrent une grande homogénéité.

Parmi les caroténoïdes, le plus affecté est le **β** carotène qui est abaissé de **50 à 57%** au voisinage du "phénomène", ainsi que la **violaxanthine (-80% chez les jeunes feuilles)**.

Les perturbations observées au niveau des pigments **photosynthétiques** peuvent être examinées par comparaison avec celles produites dans **les** feuilles cotylédonaire **d'Arabidopsis thaliana** (crucifère) après exposition des graines à une irradiation γ (**BOUNIAS, 1973, Arabidopsis inf. serv., 10, 26-27**). Les données numériques suivantes montrent qu'il est nécessaire d'appliquer une dose très importante de rayons γ : **10^6 rads**, pour obtenir des altérations tout au **plus** équivalentes ou inférieures à celles observées dans les feuilles de Medicago.

Analysis of samples

Work in progress : cooperation Dr J. Vallée – SIGMA2

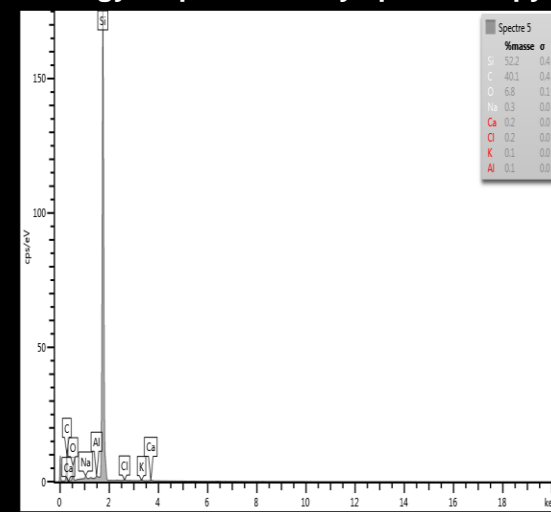
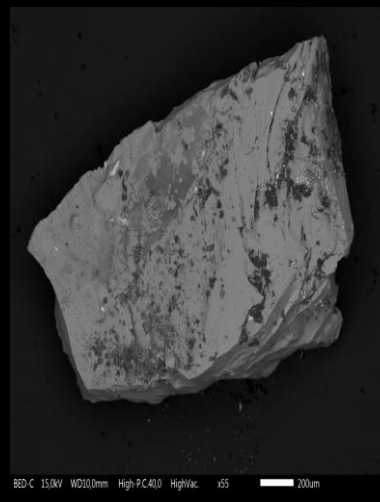


SEM

scanning electron microscope

EDX

Energy-dispersive X-ray spectroscopy

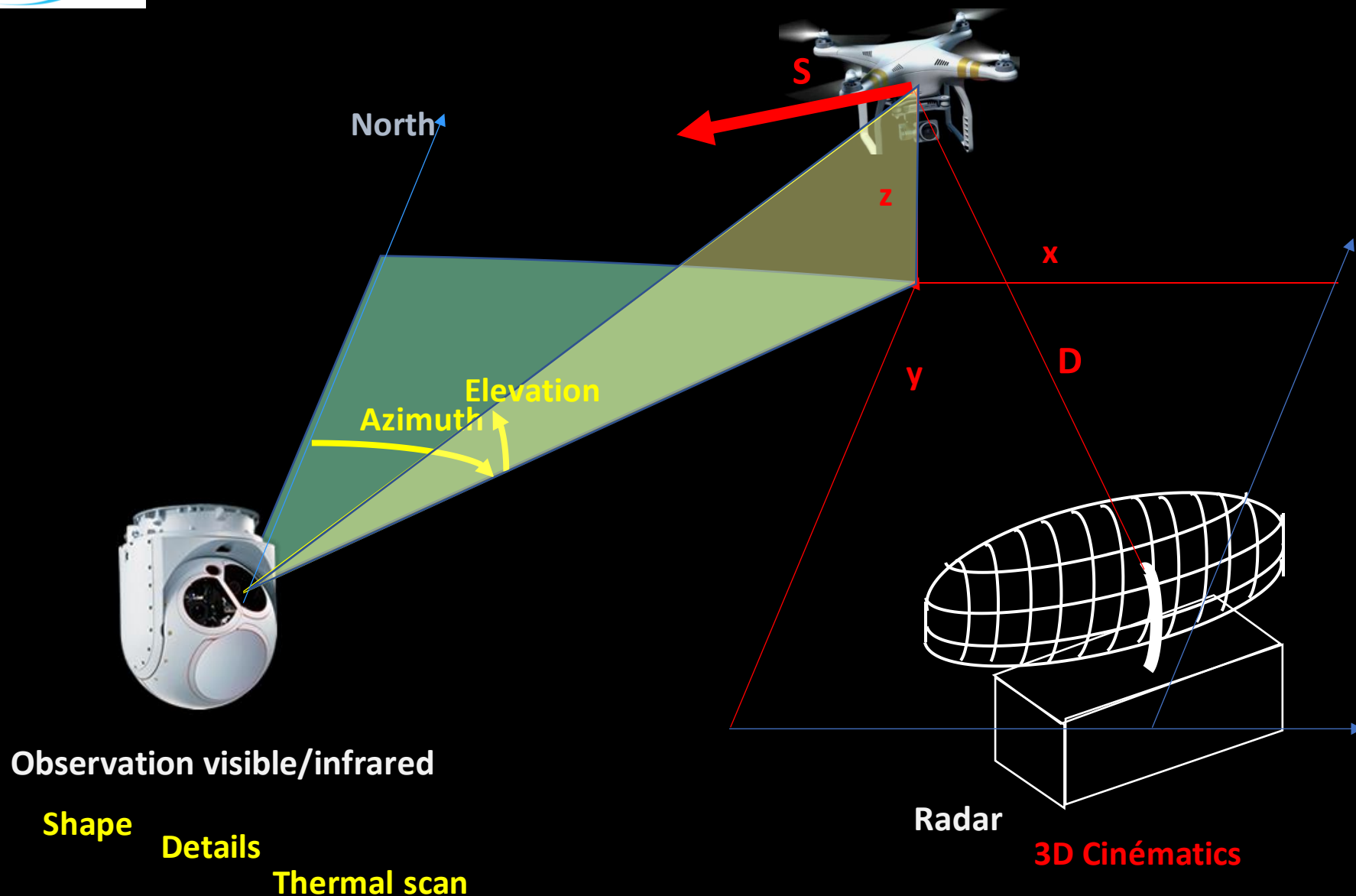


SIGMA2: a collaborative and multi disciplinary approach to study UAP



- **Aknowledgments**
- **Introduction to 3AF SIGMA2 : from “MOC to UAP” and GEIPAN, SIGMA2**
- **International situation**
- **What is UAP physical observables approach by SIGMA2**
- **Optical and EM observables: plasma multi phenomena, multi frequency observation**

Optical/IR observation radar are complementary

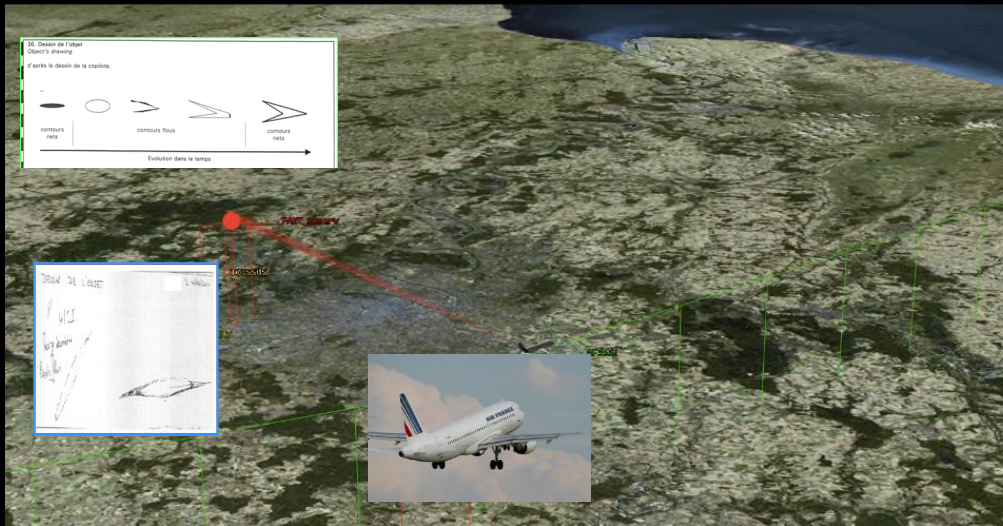


« Aéro » case of Flight AF3532 (Nice-Londres) 27/01/1994

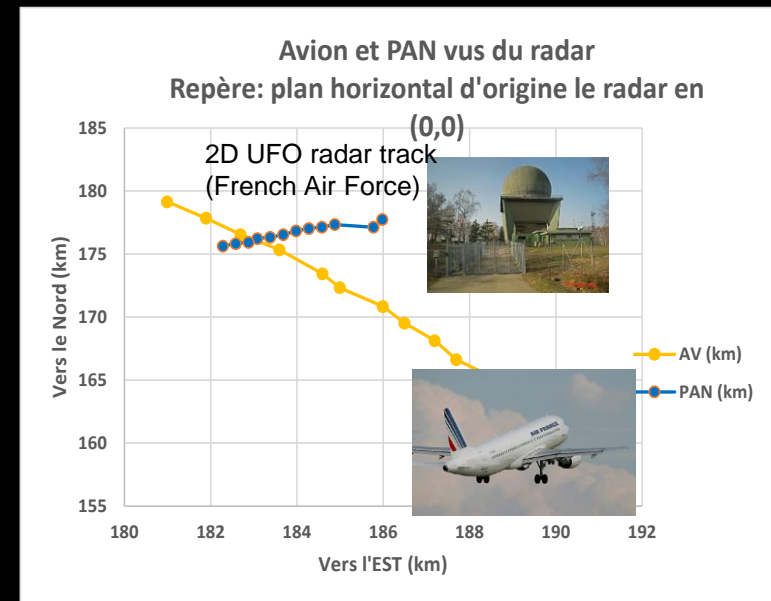
Visual sighting (optical)+ radar



Change of shape (Observation flying officer)



Disc (Observation from Captain Duboc)



Optical/ visual sighting: object round, change of shape (disk to triangle) left sector
 Simultaneous radar track on right side of the aircraft
 (different localization of the optical object “center” and the Radar phase center)
 Both disappeared (visual sighting and radar track) simultaneously

Case study: Chilean Navy "Cougar" UAP (11/11/2014)

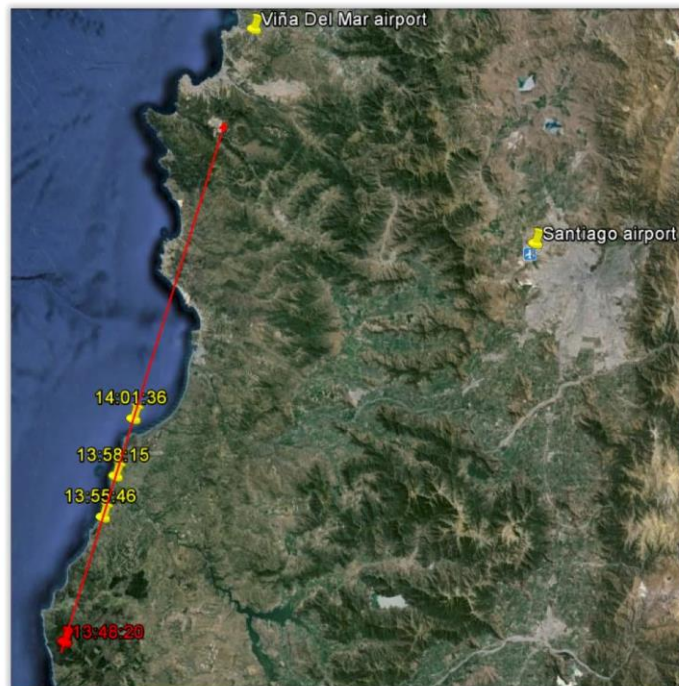


3

Helicopter's track

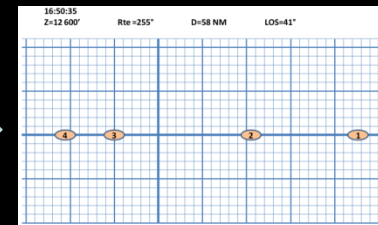
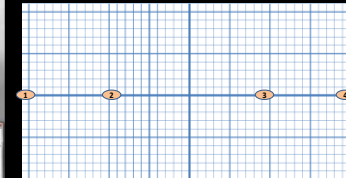
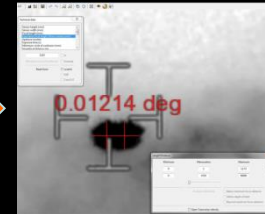
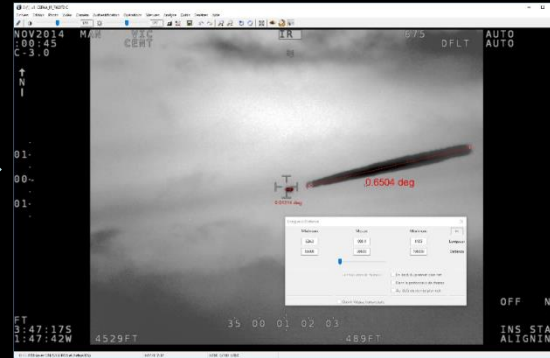
According to the technical data displayed around the image in the video, we could learn that the helicopter was flying towards North (+17°), following the object.

The following map, showing the helicopter's track, was derived from the displayed geographic coordinates:

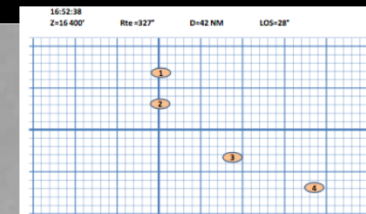




Case study: Chilean Navy "Cougar" UAP (11/11/2014)

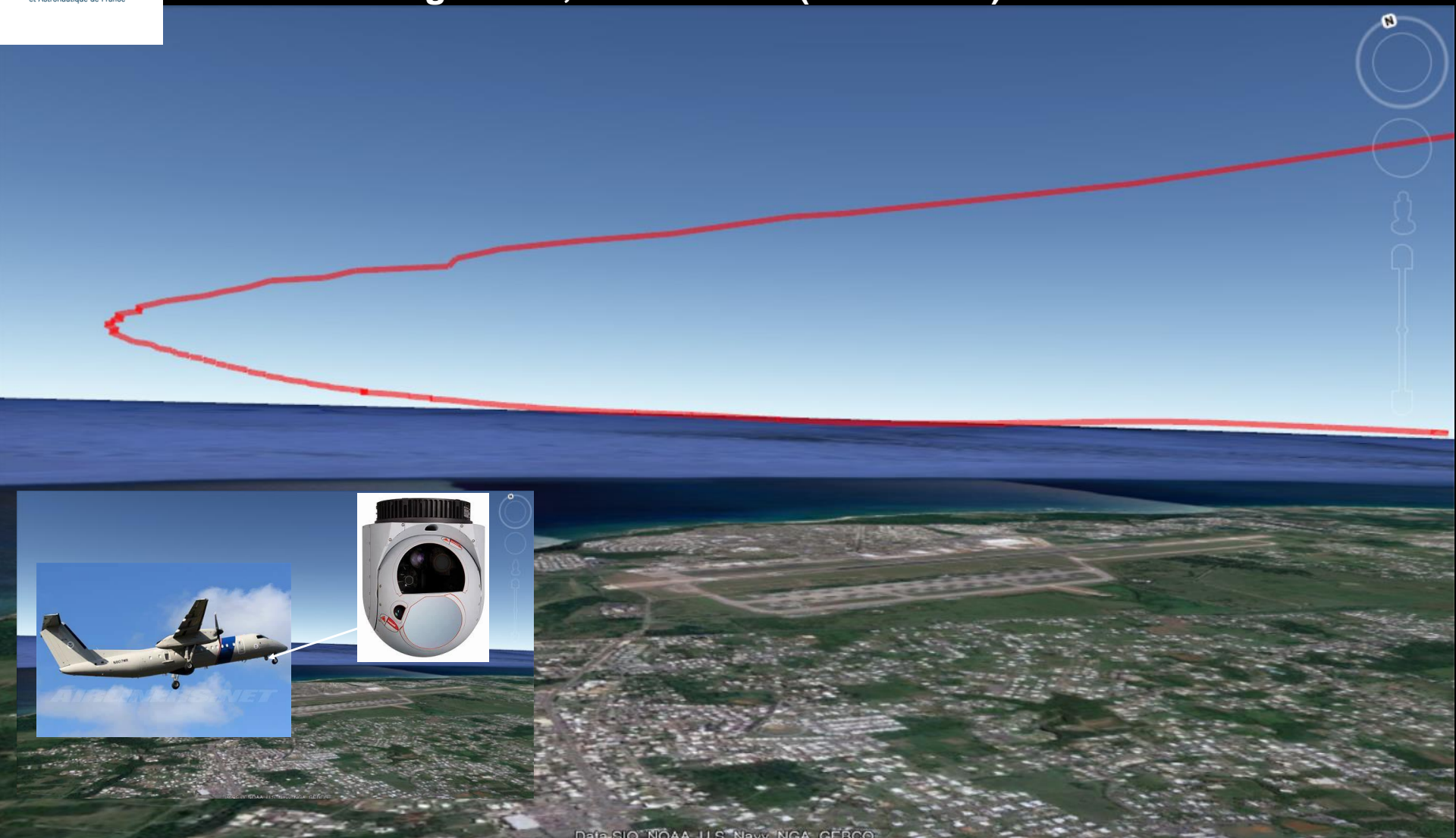


Pas d'observation IR
16:50:35
R> 80 km Secteur avant



IR images from Cougar

UAP at the Rafael Hernández International Airport (BQN) Aguadilla, Puerto Rico (25/04/2013)



Data: SIO NOAA U.S. Navy NGA GEBCO

Case study:

UAP: Aguadilla airport, Puerto Rico (25/04/2013)



**UAP image disappearing
or fading**

UAP image splitting

Why?

**What is the trajectory?
Range? Altitude?**

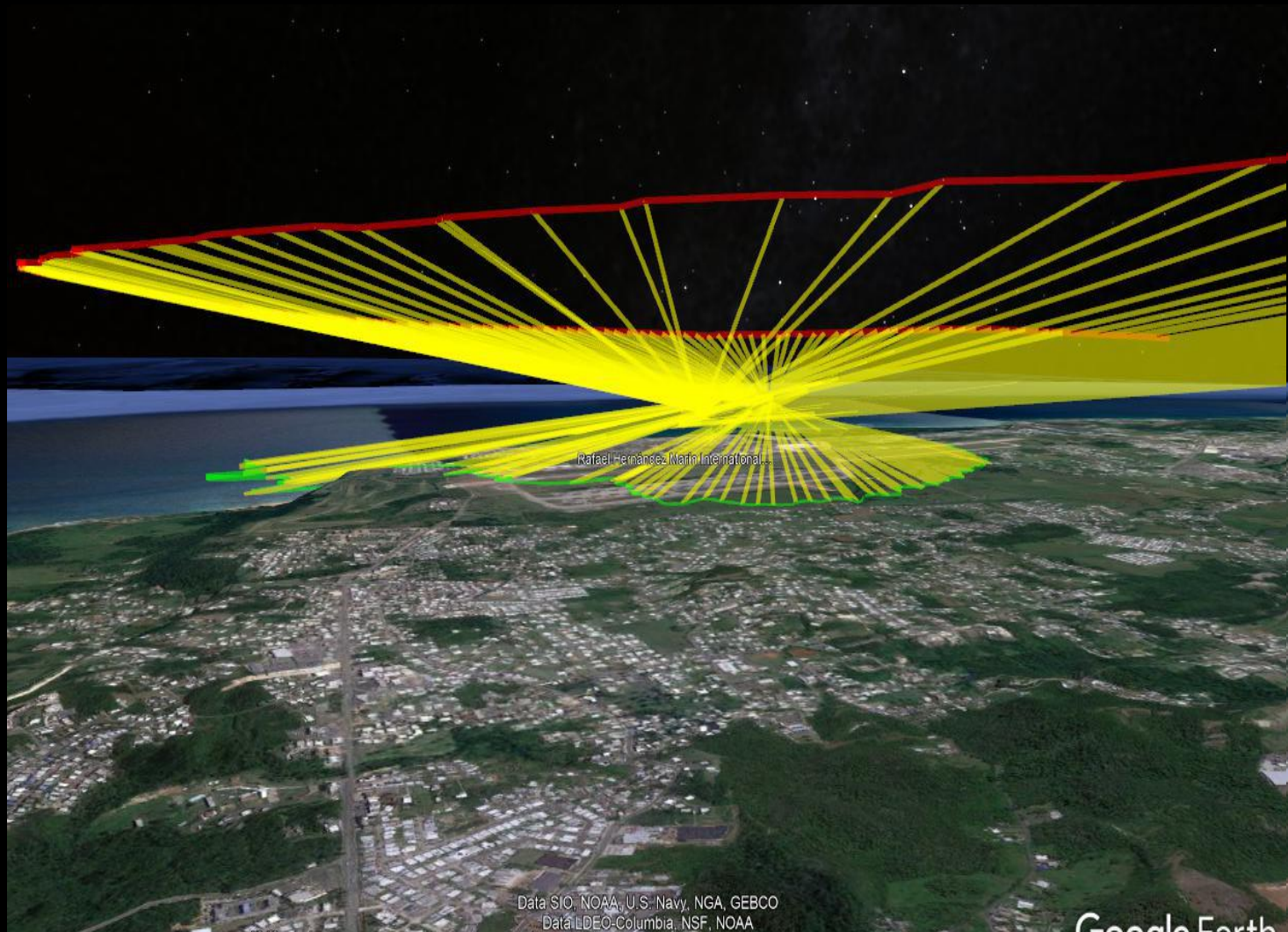
Case study: UAP: Aguadilla airport, Puerto Rico (25/04/2013)



**Video data based
DHC-8 trajectory**

**Target altitudes =
ground elevation**

**UAP location can
be anywhere on
lines of sight
(LOS)**



Case study:

UAP: Aguadilla airport, Puerto Rico (25/04/2013)



Object signature (shape) in visible and IR are different

in visible the real shape is seen by reflecting the sunshine.

In IR spectrum, the shape is perceived from thermal emission (hot spots mainly, partially seen) some generating an image.

Blurring mostly due to saturation.



**3 engines jet seen by the DHC-8 patrol aircraft IR camera (IR band 2)
3 hot spots nozzles with saturating effect (white circles)**

**Microdrone – electrical powered with rotors
In visible (left- IR band 2 center- IR band 3 right)**

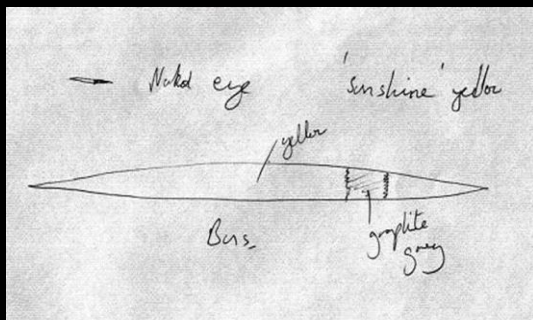


Thai lantern : visible (right), IR band 3 image (left)

Sighting case analysis

CHANNEL ISLAND CASE (GUERNSEY-JERSEY) 23/04/2007

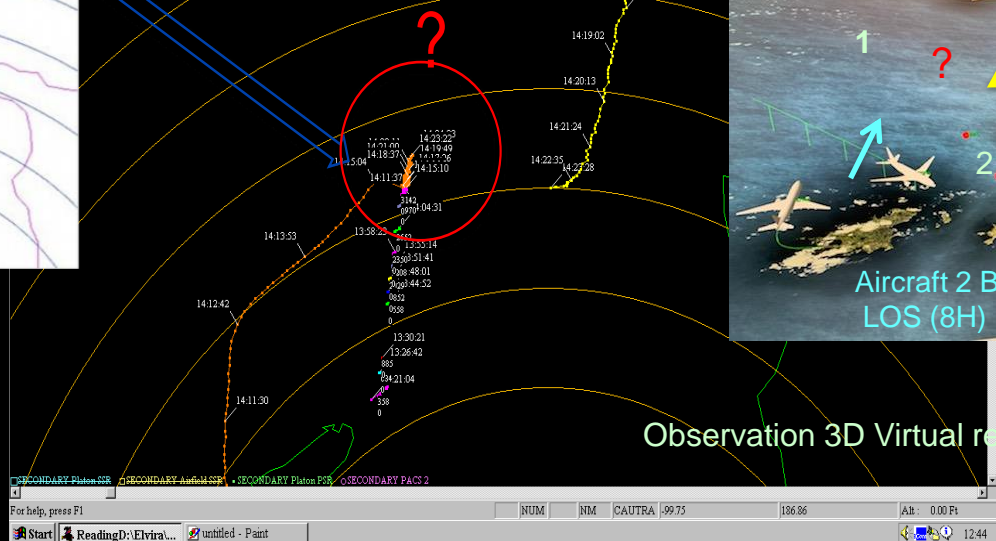
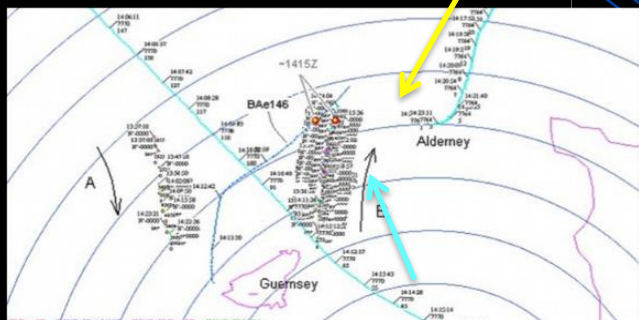
SIGMA2 attempt to analyse Elvira radar files (on going)



ELVIRA ATC system
Screenshots during event

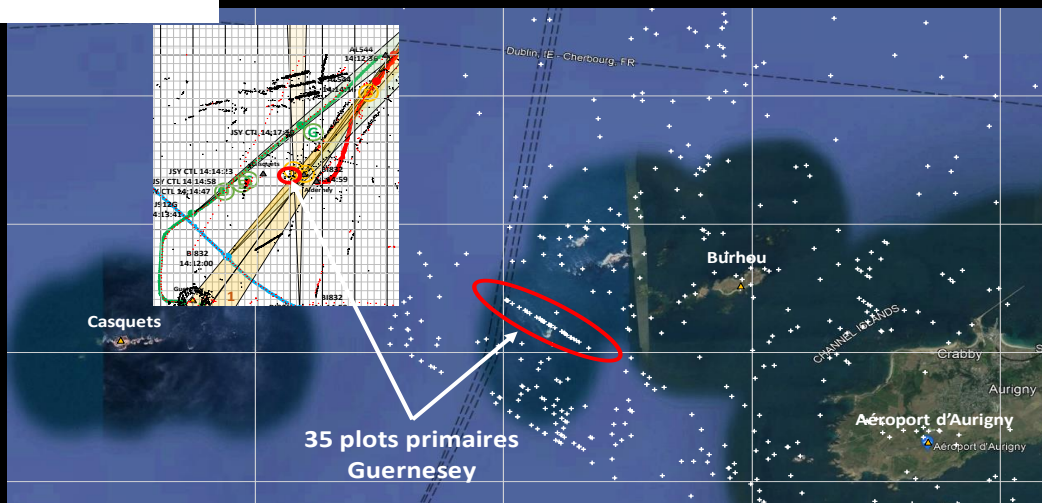


Deux échos radar
de grande taille à
analyser

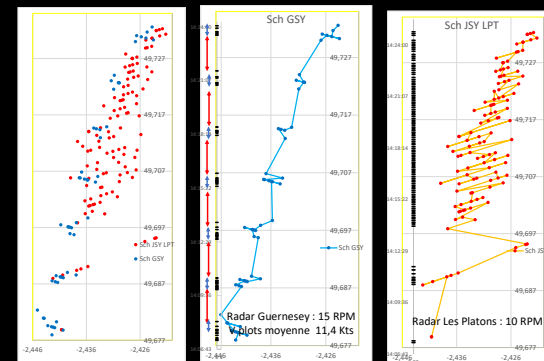


Observation 3D Virtual restitution

CHANNEL ISLAND CASE (GUERNSEY-JERSEY) 23/04/2007 SIGMA2 Elvira radars plots complex analysis (on going)



Some anomalies under analysis
Groups of plots – 1300 m line continuous radar return
Presence 13:34 t57 o 14:14:25



Track 1 Radar plots mapping
Leapfrog seen from Guernesey and Jersey

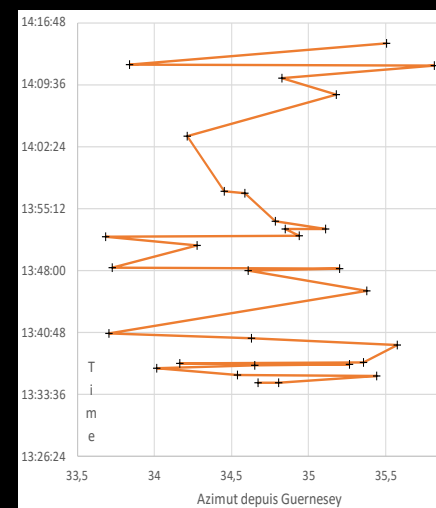
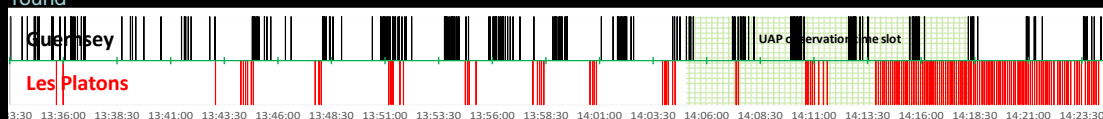
Suggesting strong RCS in one direction- glint effect
Frog leaps seen from Guernesey

Track 1: leapfrog plots close eachother from Jersey (red) and Guernesey radar (blue) - strong fluctuations and suite of plots:

Intermittent periodic suite of plots: (1 mn visible- 2 mn blanked): image effect? Ship visibility? Long strong RCS fluctuation? Propagation?

Guernesey: groups of 5 to 18 plots groups visible 2 mn, then blanked 1 mn

Jersey: groups of 5 to 8 plots, blanking during 2 minutes- then continuous at 14:14, presence each antenna round



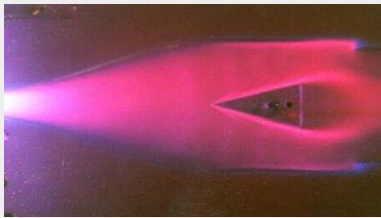
Plasma generation in visible and UV spectrum

« visible and blue glows »: artificial or natural generation?

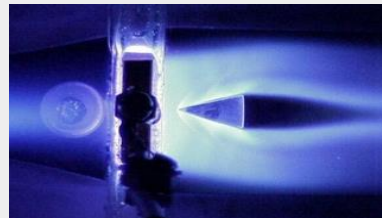


Electrical discharge can create plasma
The modulation of the discharge can be detected

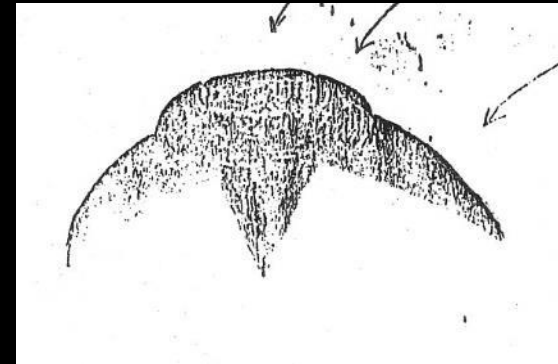
EME effect: close encounter with UAP (SCU Toronto case-
object surrounded by a blue glow with pulsation- smart
phone and camera jammed submitted to EME with periodic
signal (recorded in the camera)



Photograph of the supersonic nitrogen plasma flow over a wedge in a DC discharge afterglow. $P_0=2/3$ atm, $M=3$



Photograph of the supersonic nitrogen plasma flow over a wedge in an RF discharge afterglow. $P_0=1/3$ atm, $M=2$



Bright radiation (Teheran case) from UAP
With EM jamming-neutralization of fighters'
radio/missile firing equipment-jamming of civil traffic
navigation devices in a sector

Nitrogen plasma blue afterglow can be generated by electrical
discharge –MHD can be used to modify the airflow around a vehicle
(aero coefficient) and the EM signature (virtual vehicle). The modulation
of the EM field can induce modulation of the light glow.

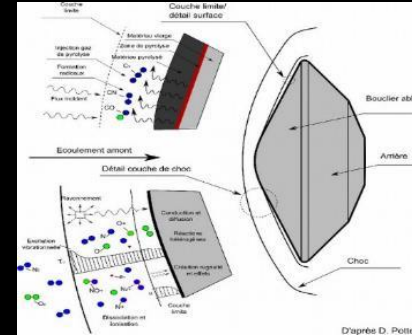
kinetic effect, compressional heating of the air in the boundary layer around the nose of the spacecraft, rocket or meteoroid



Shockwave with plasma shock generator



Hypervelocity glider vehicle with plasma boundary layer



The compressional heating of the air slowing down in the boundary layer creates a plasma.
The recombination and deexcitation of the air plasma electrons release light in the IR, visible, UV and X-ray domain.
This layer with free electrons can absorb EM radiation (radio blackout on reentry).



Atmospheric re entry shockwave plasma: bolid (natural- compression shockwave)

Generates plasma- can be used by EM RF trackers (like Fripon system)

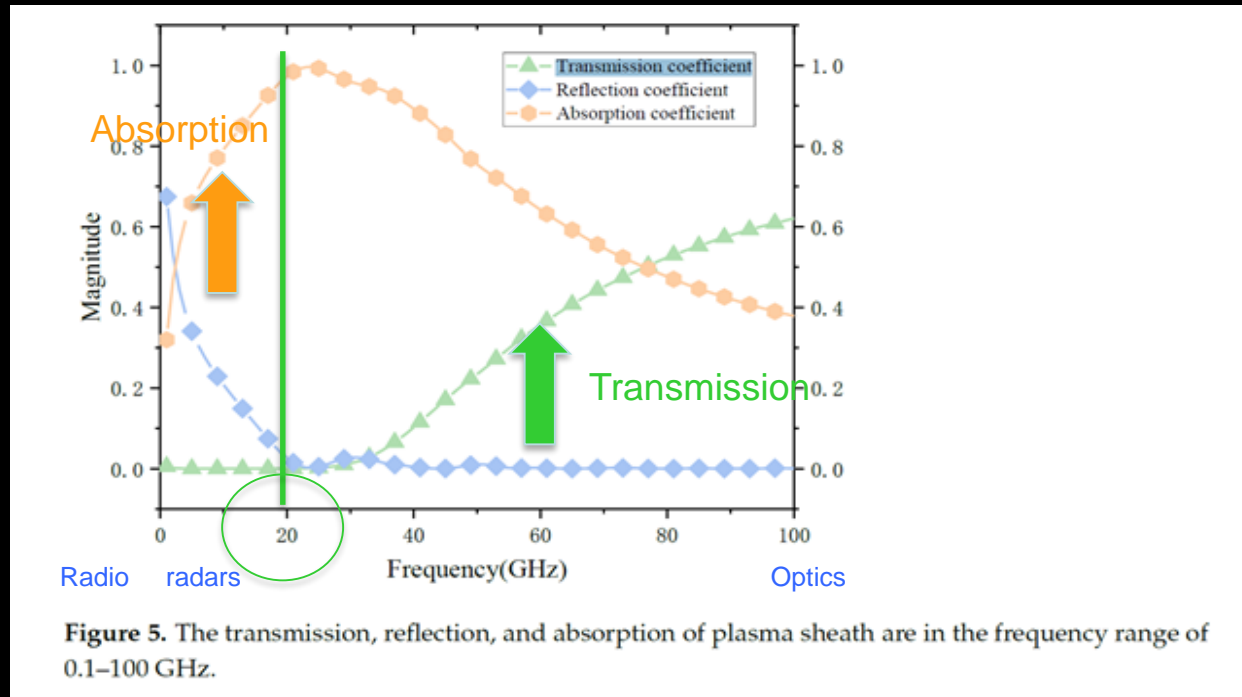
Plasma: interaction with EM waves (radars, optics) versus frequency

$$\omega_p = \sqrt{\frac{n e^2}{m \epsilon_0}}$$

où n est la concentration des électrons, e est la charge élémentaire, m est la masse d'un électron, et ϵ_0 est la constante diélectrique.

Plasma acts as a high passband filter depending on the electrons density and the EM wave frequency versus plasma cut off frequency ω_p (here example $\omega_p = 20$ GHz)

Explains the various effects of plasma on EM waves (reentry radio black out- radar RCS absorption/refraction / transmission on hypersonic vehicles or artificial plasma)



SIGMA2: a collaborative and multi disciplinary approach to study UAP



- **Aknowledgments**
- **Introduction to 3AF SIGMA2 : from “MOC to UAP” and GEIPAN, SIGMA2**
- **International situation**
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- **Optical and EM observables: plasma multi phenomena, multi frequency observation**

optical observation approach : WFOV & NFOV observations



Object optical and RF 3D tracking

- **Range, velocity, acceleration estimates**
- Unsensitive to acceleration/ manoeuvres
- Doppler RF measurement (if reflective)
- Low resolution: numbers of objects, no high resolution

W FOV visible camera

+ RF bistatic : Fripon like (doppler measurement if RCS or ionized wake allows it)



Pointing of sensors to the object

**Spectral analysis (optical
RF ELINT)
High resolution imaging
Radar accurate tracking**

**Farfadet Network (SPRITES LTE)
multisensory**

Object observables characterization

- Shape, size
- Spectrum (RF, optical) self emission, albedo

NFOV camera and analysis sensors
Ground based airborne
Need initial pointing

Other communication references



Association Aéronautique
et Astronautique de France

Participation to TV Show on ANEWS Web TV: [“Dossiers OVNIS since 2021”](#)

- <https://www.aneWS-securite.fr/emission/emissions/dossier-ovni/>



March 2022: UAP are real: physical observables

A. Juillet-D. Filhol-R. Powell (SCU)- F. Milburn (UK) –L. Dini

Jan 23: expérience de pilotes sur les PAN

A Juillet-GBA B. Mignot –IGA P. Bescond- JC Bourret L. Dini

Nov 2023: Round table on UAP US and international environment

A.Juillet-M. Chris Mellon (former dep assistant SecDef)
Dr J. Vallee- IGA Bescond- L. Dini- B. Friscourt

- **SIGMA2 Webinar1 on UAP Optical observables (14 June 2023)**

- https://www.3af.fr/global/gene/link.php?doc_link=/media/event/2023164317_announcement-3af-sigma2-webinar-1-on-uap-june-2023.pdf

- <https://www.3af.fr/agenda/3af-sigma2-webinar-1-on-uap-optical-observables-2270>

- **SIGMA2 participation to SCU Webinar on UAP studies (30 July 2023)**

- <https://www.youtube.com/watch?v=G81h4KEz2M>



- **Echo Event on UAP : La Sorbonne (4 and 5 Nov 2023)**





Association Aéronautique
et Astronautique de France

Published on 09/11/2024



OVNIS

PRÉFACE DE PIERRE BESCOND

Depuis juin 2020 et la déclassification des dossiers du Pentagone, la chasse aux ovnis est officielle, et, outre-Atlantique, on admet enfin qu'il existe des phénomènes curieux d'origine possiblement extraterrestre ».

Ces manifestations captivent l'attention de tous, et chaque nouvelle publication, particulièrement celles émanant de la Nasa, suscite les rumeurs les plus folles. Débris d'engin, crashes extraterrestres, qu'en est-il vraiment ?

Luc Dini, expert français mondialement reconnu sur les phénomènes aérospatiaux, décrypte pour nous ces ressources exceptionnelles jusqu'alors classées secret-défense.

L'ENQUÊTE CHOC SUR LE PHÉNOMÈNE OVNI

LUC DINI est ingénieur en constructions aéronautiques et expert dans les domaines de la détection radar et infrarouge. Il est membre du Geipan (Groupe d'études et d'information sur les phénomènes aérospatiaux non identifiés, les Pan, créé par le Cnes) et membre émérite de l'Association aéronautique et astronautique de France (3AF). Il préside également la commission Sigma 2 qui, en coordination avec le Geipan et d'autres organismes à l'étranger, étudie les Pan par l'analyse scientifique et technique.



10-23
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www.michel-lafon.com

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Michel
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LUC DINI

OVNIS

LUC DINI

OVNIS

LUMIÈRE SUR LES DOSSIERS
DU PENTAGONE



Michel
LAFON

OBJETS VOLANTS NON IDENTIFIÉS

PRÉFÈRE : BERNARD

54872 >> 15487

54876 >> 54875



Association Aéronautique
et Astronautique de France

Some SIGMA2 links and reference



- **3AF SIGMA2 website events**
 - <https://www.3af.fr/groupe/sigma2-phenomenes-aerospaciaux-non-identifies-43/page/actualites>
 - <https://www.3af.fr/fr/agenda/3af-sigma2-webinar-2-approach-to-uap-physical-observables-2324>
- **SIGMA2 analysis of ODNI preliminary assessment on UAP (2021)**
 - ODNI report 2021: https://www.3af.fr/global/gene/link.php?doc_id=4558&fg=1
 - ODNI report 2022:
 - <https://www.explorescu.org/post/sigma2-analysis-of-odni-2022-annual-reporton-unidentified-aerial-phenomena>
- **SIGMA2 2021 summary progress report:**
 - <https://www.3af.fr/news/sigma2-work-progress-summary-2021-2178>
 - https://www.3af.fr/global/gene/link.php?doc_id=4375&fg=1
- **SIGMA2 Progress report 2021 complete:**
 - <https://www.3af.fr/agenda/download-the-sigma2-progress-report-2149>