



ESSAY

A History of Scientific Approaches to Unidentified Anomalous Phenomena: Time to Rethink their Relegation to the Paranormal and Engage Seriously?

Tim Lomas

tlomas@hsph.harvard.edu

HIGHLIGHTS

The study of unidentified aerial phenomena (UAPs) has gradually outgrown its “paranormal” stigma to become a mainstream scientific topic.

ABSTRACT

The topic of “Unidentified Anomalous Phenomena” (UAP) has historically been regarded with skepticism by the scientific community. After a period of relative openness and ambivalence in the 1950s and 60s, it eventually became generally categorized as a “paranormal” concern and dismissed as a legitimate focus of inquiry. However, the issue has risen to public prominence over recent years. As such, this paper argues UAP should be redeemed as a scientific topic and given the scrutiny that such a potentially important phenomenon merits. The focus here is not assessing the nature of UAP per se but simply to argue this is a valid topic that the scientific community has shied away from which deserves real consideration.

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INTRODUCTION

Over the past several years, Unidentified Anomalous Phenomena (UAP) – previously/also known as Unidentified Flying Objects (UFOs) – have become an increasingly prominent concern in the public sphere. Relatedly, so have potential “extraordinary” explanations for such phenomena, including an extraterrestrial hypothesis (ETH), which suggests UAP may involve forms of non-human intelligence from elsewhere in the cosmos (Lomas, 2024). Until recently, the dominant response to this topic in various realms of authority and expertise – including scientific, military, intelligence, political, and media communities – has been skepticism and incredulity, at least

in public. Due to certain developments over the past few years, though, this attitude may be changing, at least in some quarters. However, many scientists seem to have remained strangely disinterested in the topic, often going beyond mere reasonable skepticism and into attitudes that could be regarded as anti-scientific, from indifference to an overweening certainty of “nothing to see.” However, given recent events, such attitudes are unreasonable and need revisiting. At the very least, the topic deserves serious and open-minded attention from the scientific community. This paper articulates this argument in two sections. The first explores the way science has historically treated the UAP topic, eventually relegating it to the category of the “paranormal.” The second part



then considers, in light of recent developments, whether UAP should *still* be treated as such.

Before we commence, one should note this article focuses on a North American context for various reasons, including (a) limiting its scope to a manageable amount, (b) since, of all world regions, this arguably has historically had the most UAP activity, and (c) this is my own context and area of expertise. However, contrary to some misconceptions, this is a genuinely worldwide phenomenon (Lomas, 2023). For example, in a Congressional UAP hearing in July 2023, journalist George Knapp submitted testimony regarding UAP investigations conducted by the USSR during the Cold War and stated that during a 10-year period, “thousands” of case files were accumulated, including 45 incidents in which “Russian warplanes engaged with UFOs, chased them, even shot at them” (Eberhart, 2023). Or take Latin America, of which The Washington Post reports at least four countries (Uruguay, Argentina, Chile, and Peru) have government programs that for decades have assessed UAP activity (McCoy, 2023), while others like Brazil likewise have an extensive history of sightings, with Vernet (2023) reporting that its Air Force has investigated 674 events just between 1954 and 2005. Even nations like China, which have been more secretive on this topic, have admitted to tracking the phenomenon, with an article in the South China Morning Post acknowledging that “China military uses AI to track rapidly increasing UFOs” (Chen, 2021). That said, not all countries have approached the issue in identical ways; it appears, for example, that authorities in Latin America have generally been more open compared to counterparts elsewhere (McCoy, 2023). Nevertheless, many of the trends observed in the US, as discussed here, pertain to other countries. With that in mind, we begin by considering the historical context in the US.

UAP: The Historical Context

There have been reports of UAP going back decades and even centuries (see, e.g., Lomas & Case, 2023; Vallée, 2008). However, although these initially appear to have commanded scientific interest, this mainly dissipated in the late 1960s, especially following the influential Condon Report, which – per similar endeavors in preceding years – led authorities to declare that apparent UAP most likely had prosaic explanations. Thereafter, claims that some UAP are genuinely anomalous – e.g., extraterrestrial in origin – tended to be dismissed as “paranormal.” This first part explores these developments over five sections: (1) the difficulty of navigating this historical terrain; (2) early years of scientific engagement, characterized by a tension between interest in the topic yet also efforts to

downplay it; (3) the tendency, especially post-Condon, to treat UAP as a paranormal topic; (4) some scientific interest in UAP nevertheless persisting, and (5) legitimized engagement in topics adjacent to UAP.

Navigating UAP History

Before briefly considering the history of UAP, it is worth reflecting on the very process of trying to reconstruct this story, which of all topics may be unrivaled in its elusive and uncertain nature. Crucially, there are at least three different narratives. First is the “official” account presented by the authorities themselves. “Authorities” are not a monolith, of course, with competing factions and agendas. Nevertheless, it is certainly legitimate to speak of authorities – encompassing key institutions of public life, especially political, military, intelligence, academic, and media communities – reaching a general consensus. In that respect, until very recently, authorities worldwide have tended to dismiss UAP as nothing more than prosaic natural (e.g., weather) or human-made (e.g., drones) phenomena. Crucially, though, this official narrative is not the only account of the phenomenon, and at least two others exist: the “concealed” and “revealed” stories. Essentially, the vast majority of information about this topic is highly classified, hidden behind vast, intricate walls of secrecy, and nearly entirely off-limits to the public (including academics like myself). Indeed, it is highly compartmentalized and restricted even to authority figures with the highest security clearances, so it probably cannot be known in its entirety by any one person. This is the “concealed” story. Crucially, though, between the official and concealed narratives is an enigmatic “revealed” account involving strands of the concealed story that have somehow found their way into the public domain, such as through investigative journalists or authority figures divulging information. This revealed story is the one accounts like mine generally aim to tell. However, it is very slippery and uncertain, a hall of mirrors of rumors and allegations that are often never fully substantiated. Thus, people are required to make judgment calls about the veracity of claims while never being fully certain of the true picture.

Consider, for example, the story that dominated this topic in the summer of 2023: allegations by David Grusch, an intelligence community whistleblower, that US authorities have maintained a secret UAP crash retrieval and reverse engineering program dating back at least to 1933 (Kean & Blumenthal, 2023). There is no way of knowing the truth of his claims at present. Significantly, though, the Intelligence Community Inspector General deemed his complaint “credible and urgent.” Moreover, Senator

Marco Rubio, Vice Chairman of the Senate Select Committee on Intelligence, said on June 26 that “many” other whistleblowers had corroborated Grusch’s claims, including people with “firsthand knowledge” of such programs. Similarly, Shellenberger et al. (2023, para. 2) reported “at least 30 other whistleblowers” had given such testimony to various authorities. What to make of such information? Given how his allegations have been treated by relevant figures, I personally believe his claims – extraordinary as they are – to be more likely true than false. Consider the new bipartisan proposals, introduced in July by Chuck Schumer, Majority Leader of the Senate, for a UAP Disclosure Act (U.S.C. S.2226, 2023). As reported in *The New York Times*, this would create “a commission with broad authority to declassify government documents about U.F.O.s and extraterrestrial matters, in an attempt to force the government to share all that it knows about unidentified phenomena” (Barnes, 2023). Strikingly, the legislation essentially reiterates Grusch’s claims, including defining “legacy program” (efforts to “collect, exploit, or reverse engineer technologies of unknown origin”). In the event, the provisions in the Act were significantly weakened when only minimal aspects were passed into law in December in the National Defense Authorization Act for the fiscal year 2024. Notably, resistance reportedly came from House Representatives with close ties to the very aerospace companies rumoured to have engaged in UAP reverse engineering efforts, and who would thus be affected by, and moreover motivated to oppose, the original legislation (Sharp, 2023). As Schumer (2023) himself posted on X, ““It is an outrage that the House didn’t work with us on our UAP proposal for a review board [one of the most consequential aspects of the proposed legislation]. This means declassification of UAP records will be up to the same entities who have blocked and obfuscated their disclosure for decades. We will keep working to change the status quo””. Nevertheless, even in its stripped-back state, the NDAA still contains some remarkable UAP-related provisions and language, including requiring federal agencies to release “all records that most un-ambiguously and definitively pertain to unidentified anomalous phenomena, technologies of unknown origin, and non-human intelligence” (HR.2670, Sections 1841-1843; see Johnson, 2023). The key point here is that it seems highly unlikely that the Senate Majority Leader would make such public remarks, and especially propose such remarkable legislation, absent highly credible corroborating evidence or testimony. Hence me suggesting that Grusch’s claims may well, on balance, contain at least some truth.

However, I cannot be certain, of course; as such, this paper includes his allegations as *possibly* true – since, given their impact, it seems inappropriate to omit them

– while recognizing they may well not be and leaving people to draw their own conclusions. Even aside from these allegations, though, the revealed history that *has* already been generally accepted as factual is remarkable enough as we consider next.

Recent UAP History

The modern UAP movement can generally be dated, notwithstanding Grusch’s claims of a crash retrieval program going back to the 1930s, to World War II, which saw a proliferation of strange aerial events observed by pilots that officials feared were a new form of weaponry (Hanks, 2023). A *New York Times* piece in 1944, for example, headlined “Floating mystery ball is new Nazi air weapon,” reported, “Airmen of the American Air Force report that they are encountering silver colored spheres in the air over German territory,” and that “The spheres are encountered either singly or in clusters. Sometimes they are semi-translucent.” American aviators described these “balls of fire” as “foo fighters” (from the French *feu*, meaning fire). *The Indianapolis Star*, for instance, reported how they “appear suddenly and accompany the plane for miles,” even at 300 mph, and yet – contrary to fears of these being weaponry – noted how “they don’t explode or attack us. They just seem to follow us like “will-o-the-wisps” (Wilson, 1945). Similarly, a raft of cigar-shaped objects reported over Scandinavia in 1946 – with more than 1,000 in Sweden alone – led US army intelligence to suspect the Russians had developed a secret weapon. Then, in 1947, sightings began to be reported in the mainland US, beginning on June 24th, when pilot Kenneth Arnold famously saw what he famously called nine “saucer-like things... flying like geese in a diagonal chainlike line” in Washington State (Roos, 2020). This was the catalyst for a new UFO “movement.” Within weeks, similar sightings were reported in 40 other states. This caused considerable concern for authorities, as recounted in a *New York Times* article titled “U.F.O files: The untold story” (Huyghe, 1979). At first, per the wartime sightings, these events were primarily interpreted through the lens of warfare. For example, Brigadier General Schulgen of Army Air Corps Intelligence requested the F.B.I.’s assistance “in locating and questioning the individuals who first sighted the so-called flying discs....” mainly because he worried that these “might have been by individuals of Communist sympathies with the view to causing hysteria and fear of a secret Russian weapon.”

Whatever the motives for investigating, from that point on, authorities began taking the issue seriously (Swords & Powell, 2012). Moreover, they swiftly appear to have realized the phenomenon was genuine, as articulat-

ed in a famous memo sent to Schulgen in September 1947 by Lieutenant General Twining (1947), Army Chief of Staff, stating “the phenomenon reported is of something real and not visionary or fictitious,” that the objects appeared to be disc-shaped, “as large as man-made aircraft,” and “controlled either manually, automatically or remotely” (Zabel, 2021). At Twining’s urging, in early 1948, the Air Force established Project Sign, an intelligence operation based at Wright-Patterson Air Force Base, to examine the issue. It was subsequently reported – initially by Air Force UFO investigator Edward Ruppelt (1956) – that in 1948, the project submitted an unofficial “Estimate of the Situation,” classified “Top Secret,” that UAP were extraterrestrial in origin. However, when the report reached the Air Force Chief of Staff, General Vandenberg, he rejected it, ostensibly for lack of proof. However, his resistance may have run even deeper: Swords (2000) records that “elements of very high rank in the Pentagon” would not actually *accept* an ETH for UAP, with this lack of support resulting in the breakup of the Sign and the alleged destruction of all (with perhaps an exception) copies of the Estimate.

Moreover, this negativity towards the ETH, and the topic generally, was carried into Sign’s successor, Project Grudge, launched in 1949. Its ethos was later revealed by astronomer J. Allen Hynek (1977), who was a consultant to both projects. His recollection was of two competing schools of thought in the Air Force. One, mostly based at Wright-Patterson, thought UAP were most likely extraterrestrial. The second, which constituted a majority at the Pentagon, regarded the topic as “nonsense” (Swords, 2000, p. 43). Crucially, the Air Force’s Scientific Advisory Board sided with the latter, as did Hynek himself at the time, who recalled, “my interim reports helped the transformation of Project Sign into the extremely negative Project Grudge, which took as its premise that UFOs simply *could not be*. I tried hard to find astronomical explanations for as many cases as I could, and in those that I couldn’t, I reached to draw out as many natural explanations as possible. Sometimes, I stretched too far. Clearly, I, too, thought at the time that UFOs were just a lot of nonsense. I enjoyed the role of debunker” (p. 17, italics in original). Thus, Project Grudge was engineered, as Haines (1999) puts it, “to alleviate public anxiety over UFOs via a public relations campaign designed to persuade the public that UFOs constituted nothing unusual or extraordinary” (p. 68). Indeed, the Air Force announced Grudge’s termination that same year, in part due to fears the very fact of Air Force interest would encourage people to believe in UFOs and contribute to the “war hysteria” (already a concern, given Cold War tensions). Thus, as far as the public was concerned, the Air Force was no longer

interested in UAP – even though, behind the scenes, it continued to collect reports through regular intelligence channels, with a dramatic sighting at the Army Signal Corps radar center in Fort Monmouth in 1951 leading to the reactivation of Grudge, which was repurposed and re-named as Project Blue Book in 1952. Similarly, while the CIA concluded that “since there is a remote possibility that they may be interplanetary aircraft, it is necessary to investigate each sighting,” it recommended it conceal its interest from the public and the media “in view of their probable alarmist tendencies.”

Nevertheless, sightings continued and indeed escalated, exemplified by a “UFO mania” in 1952 (Roos, 2020), which included a surge of observations in Washington DC in July so dramatic they generated headlines like “Saucers Swarm Over Capital” and “Jets Chase D.C. Sky Ghosts.” However, these too were downplayed. On the recommendations of the CIA, a scientific panel headed by physicist Howard Robertson was established to examine the issue. However, this was criticized as perfunctory, meeting for just 12 hours and reviewing only 23 cases out of 2,331 Air Force cases on record. Even so, there were intriguing elements: a presentation by Major Fournet – who had coordinated UFO affairs for the Pentagon for over a year – “showed how he had eliminated each of the known and probable causes of sightings, leaving him “extra-terrestrial” as the only one remaining in many cases” (Durant, 1953). However, despite his observations, “The Panel concluded unanimously that there was no evidence of a direct threat to national security in the objects sighted,” and that they did not find “any evidence that related the objects sighted to space travelers.” Moreover, the committee argued that continued openness to the phenomenon by authorities might threaten “the orderly functioning of the government”, including by inducing “hysterical mass behavior” (cited in Haines, 1999, p. 72). As such, it explicitly recommended the National Security Council debunk UFO reports and establish a policy of public education to reassure the public regarding the lack of evidence on the topic.

Similar patterns were observed in relation to Project Blue Book, which ran from 1952 to 1969. As with the Robison panel, although its reports included intriguing details that suggested some UAP were genuinely extraordinary, its overall effect was to gloss over these anomalies. A 1955 report, for example, “prepared by a panel of scientists both in and out of the Air Force,” examined 2,199 cases. Of the 213 in the “excellent” category (i.e., most credible and of the highest quality), while the majority were judged as having prosaic explanations – including astronomical phenomena (52), an aircraft (41), a balloon (25), other (15), and insufficient information (9) – one

third (71) were classified “unknown.” However, despite this large percentage, the overall conclusion was that it was “highly improbable” that the UAP studied “represent observations of technological developments outside the range of present-day scientific knowledge.” Given such blandishments, critics suggest Blue Book essentially continued the spirit of Grudge in aiming to downplay the issue (Michels, 2023). Yet despite these public reassurances, UAP caused ongoing concern to authorities in private, as admitted by Rear Admiral Hillenkoetter – first Director of the CIA, from 1947 to 1950 – with *The New York Times* (1960) quoting him as saying “Behind the scenes, high-ranking Air Force officers are soberly concerned about the UFO’s. But through official secrecy and ridicule, many citizens are led to believe the unknown flying objects are nonsense.” Similarly, Griffen (1960) reported that he “recently declared” – presumably in the late 1950s – “about the flying saucers” that “the unknown objects are under intelligent control. It is imperative that we learn where the UFO’s... come from and what their purpose is.” Griffen further notes that, regarding “World War II and the years immediately following,” Hillenkoetter said, “I know that neither Russia nor this country had anything even approaching such high speeds and maneuvers.”

Eventually, Congressional pressure led to the Air Force establishing an authoritative panel in 1966, led by physicist Edward Condon of the University of Colorado. His committee delivered its 1485-page report to the Air Force in November 1968, which it released in January 1969 (Condon, 1969). As per previous endeavors, a substantial minority of sightings resisted prosaic explanations. Indeed, the report suggested some UAP were genuinely extraordinary (e.g., extraterrestrial). One of its 59 detailed case studies, for example, was the Lakenheath-Bentwaters incident, involving radar and visual contacts with UAP over airbases in eastern England on the night of 13-14 August 1956. Of this, it concludes, “the probability that at least one genuine UFO was involved appears to be fairly high.” Crucially though, despite such anomalies, when it came to its overall conclusion, the report continued in the vein of its predecessors and declared that UAP were most likely prosaic. Even more damningly and consequentially, it declared the topic was of no scientific interest, stating, “Our general conclusion is that nothing has come from the study of UFOs in the past 21 years that has added to scientific knowledge.” Of course, this is at odds with its analysis of cases like Lakenheath-Bentwaters, and critics accused it of obfuscating the ongoing uncertainty around the topic. Hynek (1972) was particularly scathing, dismissing its summary introduction in particular as “singularly slanted,” not least as it “avoided mentioning that there was embedded within the bowels of the report a

remaining mystery; that the committee had been unable to furnish adequate explanations for more than a quarter of the cases examined.”

Indeed, some speculate the report was *designed* to dismiss the topic. A memo written in 1966 by Robert Low, for example – coordinator of the committee and a former CIA officer – states “the trick would be” to give the impression of “a totally objective study,” which critics have interpreted as a planned cover-up (Coulthart, 2021). Similarly, a letter written to Condon in 1967 by Lieutenant Colonel Hippler clearly communicates the Air Force’s desire to be relieved of Blue Book (“you must consider the cost of the Air Force program on UFOs, and determine if the taxpayer should support this for the next decade”) (Swords, 1995). Moreover, he suggests the report do this by closing down discussion of an ETH (e.g., “No one knows of a visitation. It should therefore follow there has been no visitation to date”). Indeed, Michels (2023) suggests Condon may have secretly been “clued into high-level UFO secrets from the start” through his role in the Manhattan Project (e.g., he recruited many of its staff and wrote the Los Alamos Primer all had to read), so may have been minded to help retain institutional secrecy. The context for his claim is Jacques Vallée’s allegation that Manhattan was secretly the “first Bluebook,” taking “custody” of UAP-related discoveries, which would then “go into the Atomic Energy Commission, and then it would go into the Department of Energy” (cited in Michels, 2023). To that point, David Grusch suggests the emerging atomic legislation provided a perfect cover for concealing UAP programs: “The guys who were involved in Manhattan were overlaying the same ecosystem of secrecy... [as for] protecting our nuclear secrets.” He notes that the definition of “special nuclear material” in the Atomic Energy Act of 1954 (H.R.5961, 1954) includes any material that is “capable of releasing substantial quantities of atomic energy,” which he suggested was used as a blanket cover for all materials retrieved from downed UAP. Hence, there is the suggestion that Condon was specifically selected as an institutional “gatekeeper” who could be relied upon to keep UAP-related information secret.

Whether such allegations have any merit is beyond the scope here. What is crucial is the effect the report had on the topic. Soon after, key scientific institutions endorsed his conclusions. The National Academic of Sciences noted that while “there remain UFO sightings that are not easily explained... so many reasonable and possible directions in which an explanation may eventually be found, that there seems to be no reason to attribute them to an extraterrestrial source without evidence that is much more convincing (Clemence et al., 1969, p. 6). Similarly, an article in *Science* proclaimed, “Condon group

finds no evidence of visits from outer space” (Boffey, 1969), while an editorial in *Nature* (1969) was particularly scornful, saying it would “be inapt to compare it with earlier centuries’ attempts to calculate how many angels could balance on the point of a pin; it is more like taking a sledgehammer to crack a nut, except that the nuts will be quite immune to its impact.” The result, as Hynek put it, “was the coup de grace to the UFO era. Science had spoken. UFOs didn’t exist, and the thousands of people who had reported strange sightings ... could all be discounted as deluded, hoaxers, or mentally unbalanced” (cited in Coulthart, 2021, p. 66). Indeed, not only did they not exist, within a scientific context, even taking their possibility seriously at all became taboo (Wendt & Duvall, 2008), with “ufology” (i.e., the study of the topic) generally derided as a “pseudoscience” (Eghigian, 2017), and UAP themselves relegated to the off-limits category of the paranormal.

Relegation to the Paranormal

Following Condon, the UAP topic was effectively placed off limits by the scientific establishment, being adjudged as not real. This is not to imply a serious and widespread interest *pre*-Condon that suddenly became divested of its enthusiasm. It is perhaps more accurate to say that, while some scientists did pay keen attention to the topic, overall, the community was relatively disinterested and ambivalent. The Condon report then solidified and justified this disinterest. Here, it is useful to invoke Kuhn’s (1962) notion of scientific paradigms. While there are various strands to his thesis, the most relevant here is that, at any given time, certain paradigms can become dominant and others marginalized. What it means to be dominant is itself a complex question and involves power dynamics vis-à-vis numerous aspects of science, including methods, analyses, theories, and interpretation. In all these respects, a broad *consensus* can emerge regarding a phenomenon, including, most relevantly here, whether it actually exists. Of course, science is not a monolith; indeed, this is the value of Kuhn’s theory; one can still find contrary opinions and dissenting voices. However, they are marginalized by the dominant paradigm, which sets the boundaries of scientific inquiry. In terms of power dynamics, the dominant paradigm tends to be that which is upheld by the scientific “establishment” (a broad gestalt of influential scientists, organizations, journals, publishers, etc). In the present case, we see this establishment at work not only in the Condon report itself but also in responses from institutions like The National Academy of Sciences and journals like *Science* and *Nature*. That said, even within the establishment are dissenting voices who,

given their status, can help challenge and shift paradigm boundaries, as explored below. Nevertheless, one can still speak of a dominant paradigm and a general consensus.

However, even if the dominant paradigm determines a phenomenon does not exist and/or is not a scientific concern, one may well still find people who believe it *does* exist and *should* be a concern. This is the case with UAP – not merely in that some seemingly anomalous phenomena are currently unidentified, but that these may have explanations that are genuinely extraordinary, like an ETH. In these cases, such phenomena (i.e., judged by science as “unreal”) tend to become designated as “paranormal” (literally, alongside or above whatever is “normal”). The best way to appreciate the function of this concept is to consider the nature and role of science. While this in itself is a complex issue, one approach is to consider which phenomena are usually *not* deemed within the scope of science. Over the years, various attempts have been made to draw boundaries in that respect. Perhaps most influential is the differentiation by C. P. Snow (1959), who argued Western society had become split into two cultures: *science* (generally concerned with the empirical study of phenomena that can be measured and quantified) and the *humanities* (devoted to aspects of life not amenable to this kind of positivist approach but nevertheless of importance to people). Somewhat similarly, Stephen Jay Gould (1997) sought to carve out distinct roles for science and religion as each representing different areas and methods of inquiry – the science concerned with facts, religion with values – such that these constituted “non-overlapping magisteria.”

While these distinctions have been much debated, they are prominent ways of carving the epistemological and scholarly territory. Moreover, they are useful for apprehending the notion of the paranormal. In particular, this does not merely denote phenomena that some people think are real but which science has pronounced outside its domain, whether in the realm of culture (per Snow) or religion (per Gould). Crucially, it refers to phenomena that some people not only think are real but, moreover, believe science *should* pay attention to. By contrast, although many people believe God exists, for example, per Gould’s framework, this pertains to religion rather than science. From the perspective of science, individual scientists may or may not regard God as real, but his existence is generally not viewed – either by believers or disbelievers – as a *paranormal* phenomenon. Rather, it is generally accepted – crucially, usually by both believers and disbelievers – as being beyond the remit of science. By contrast, the paranormal pertains to phenomena some people think *should* be in the scientific domain. From this basic perspective, science is concerned with phenomena

that can be observed, measured, and quantified. However, the key question then becomes ascertaining *which* phenomena meet these conditions.

Sometimes, the issue is that a phenomenon that may be “observable” in some respects but resists simple measurement and quantification; many elements of human psychology, for instance, fall into that category. With other phenomena, though, the key issue is ontological: Do they actually *exist*? Or, more accurately, the question is *who* believes they exist and what power they have to adjudicate and legitimize what constitutes reality. Here, we return to the role of science, which in modern secular societies has tended to have this key adjudicating and legitimating function. Whether it still does to the same degree is another issue, given how trust in scientific authorities has eroded in recent years (Eshel et al., 2022). Nevertheless, at least until recently, scientists have played this key role. Of course, since science is not a monolith, as noted above, nevertheless, one can certainly speak of a broad *consensus*. In that respect, “normal” is whatever a consensus has established is real, and “paranormal” is whatever falls outside that demarcation. Most relevantly, post-Condon UAP have been placed squarely in the paranormal camp, alongside all manner of phenomena similarly dismissed with ridicule. This denigration is encapsulated, for example, in an obituary in *The New York Times* for James Randi, whom the headline calls the “Magician Who Debunked Paranormal Claims.” In this, he is described as having turned his “formidable savvy to investigating claims of spoon bending, mind reading, fortunetelling, ghost whispering, water dowsing, faith healing, U.F.O. spotting and sundry varieties of bamboozlement” (Fox, 2020). Crucially, however, the boundary between normal and paranormal is somewhat fuzzy and contested. Even if the scientific community overall has designated a phenomenon off limits, some scientists will still advocate bringing it back within limits and may well continue to study it, as we see next.

Interest Goes Underground

Despite UAP being placed outside the boundaries of serious inquiry, some scientists nevertheless maintained an interest in the topic, yet largely outside mainstream science, concealed underground, so to speak. These include scholars already engaged the topic pre-Condon (such as Hynek and Vallée), as well as new generations of scholars arriving from the 1970s onwards – like Claude Poher in France (Poher & Vallée, 1975), Massimo Teodorani (1994) in Italy, and Peter Sturrock (1999) in the US – whom one might suggest felt gradually less constrained by the epistemological straightjacket imposed by Con-

don as his prominence and authority receded over time. Overall, these scientists fall into two main classes: those whose interest is open and public and those reportedly working in secret. That said, there may be overlap between them, with some in the first class perhaps also doing clandestine research.

Of the first class, the most well-known is Jacques Vallée, who began as an astronomer at the Paris Observatory and co-developed the first computerized map of Mars for NASA in 1963. Throughout his career, he has continued to publish influential works on the topic, like his 2008 book, *Dimensions: A Casebook of Alien Contact*. He has since been joined by others, notably Garry Nolan, an immunologist at Stanford who has not only engaged in UAP research over the past decade (e.g., Nolan et al., 2022) but has advocated for scientific engagement on this topic and indeed wrote a paper with Vallée elucidating processes for doing so (Vallée et al., 2018). Also prominent is Harvard’s Avi Loeb, director of the Galileo Project, which is systematically searching for “extraterrestrial technological artifacts,” some of which may constitute UAP (Loeb & Kirkpatrick, 2023). Indeed, Loeb argues two artifacts may have already actually engaged with Earth, one of which his team has actually potentially retrieved: an unusual meteor that fell into the Pacific Ocean in 2014 which was recognized as having an interstellar origin at “the 99.999% confidence [level] in an official letter from the US Space Command under DoD to NASA” (cited in Loeb, 2023c). Their search appears successful, retrieving more than 700 “sphericals” from its landing path (Loeb et al., 2023a). Moreover, as to their origin, one hypothesis offered by Loeb (2023b) is “an extraterrestrial technological origin,” though establishing this will require finding the intact object itself (rather than the sphericles, which are molten droplets from its surface), which Loeb hopes to recover in future. Whatever the outcome, figures like Nolan and Loeb are significant in challenging the way this topic is perceived by the scientific community, given their establishment credentials.

Then, in addition to these visible figures, other scientists may have similarly engaged in studying UAP, but in secret. If so, by definition, little would be publicly known about their activities. Nevertheless, some information has crept into the public domain. For example, even though Blue Book ended in 1969, there have long been allegations that the US government and military have maintained an interest in UAP. Significantly, in the past few years, some initiatives have been confirmed, notably the Advanced Aerospace Weapons System Applications Program (AAWSAP) – sometimes also known as the Advanced Aerospace Threat Identification Program (AATIP), with the latter acronym also used for a separate small-

er initiative at the Pentagon— which formally ran from 2008-2010. Funded with \$22 million from the Defense Intelligence Agency (DIA), it involved a company formed by Robert Bigelow and run by James Lacatski (a DIA intelligence officer). It was based at a 500-acre property in Utah owned at that point by Bigelow called “Skinwalker Ranch” – a name derived from a Navajo legend concerning vengeful shamans – with a long history of apparent paranormal activity. Hence, the title of a book by Lacatski et al. (2021) detailing the program, *Skinwalkers at the Pentagon*, which has since been augmented by a more recent book, *Inside the U.S. Government Covert UFO Program* (Lacatski et al., 2023). Strikingly, in the latter, they seemingly corroborate Grusch’s allegations, stating, “the United States was in possession of a craft of unknown origin.” Curiously, both books were cleared for release by the Pentagon; asked about this on the *Weaponized* (2023) podcast, Jeremy Corbell queried, “You told us because you were allowed to tell us that our government has a UFO in its possession and has been able to access the inside of it, right?” and Lacatski responded: “Yes, I was allowed to tell you.”

Most relevantly here, the project involved numerous scientists, including Lacatski himself (whose early research was on directed energy weapons), as well as Jay Stratton and Travis Taylor, both of whom have served on a UAP Task Force established in 2020 (discussed below). Thus, even while the dominant paradigm dismissed the UAP topic behind the scenes, it still seems to have attracted serious scientific attention. That said, this attention has generally not been facilitated or funded by mainstream scientific institutions but rather mainly by select individuals, such as Bigelow, who has the rare combination of interest in the topic combined with financial resources to explore it, as well as figures in authority like Senator Harry Reid, who had the political acumen and power to likewise corral resources towards these initiatives. Nevertheless, AAWSAP and AATIP are still notable examples of scientific engagement with the topic. Finally, in addition to this, “underground” engagement is a long tradition of more open and legitimized scientific interest in topics that are UAP-adjacent.

Legitimised UAP-Adjacent Topics

While UAP have been delegitimized as a serious scientific topic (at least publicly), a host of *adjacent* research areas have become generally regarded as legitimate. These include the interrelated ideas of (a) extra-terrestrial life per se existing elsewhere and (b) such life potentially being intelligent, as explored by fields from astronomy to astrobiology. Interestingly, before the 20th

Century, the scientific consensus leaned towards both being true before changing tack as understanding developed, only to revert again. In the 19th Century, the existence not merely of life elsewhere but intelligent forms held sway, exemplified by an 1831 textbook, *The Young Astronomer*, which explained, “To the people who live on Mars, this earth probably appears larger than Mars does to us” (cited in Library of Congress, 2023). This view was solidified by the apparent observations of “canals” (a network of long straight lines) first described by Italian astronomer Giovanni Schiaparelli in 1877, though significantly, he called these simply *canali* (“channels”), which was mistranslated as “canals,” with the latter implying technological craftsmanship (Laskow, 2016). The idea was embraced by scientists, most notably renowned astronomer Percival Lowell, who published three books on the topic: *Mars* (1895), *Mars and its Canals* (1906), and *Mars as the Abode of Life* (1908). However, by the early 20th century, the consensus had turned against the idea of constructed canals, instead regarding these as merely optical illusions. The issue was then settled in 1965 when photographs taken by NASA’s Mariner IV found no canals, not even something that could be misinterpreted as such.

By this point, the scientific community had now deemed both (a) and (b) highly improbable, not least because planetary systems were thought to be very rare. Indeed, only in 1995 was the first extrasolar planet – orbiting 51 Pegasi, about 50 light-years away – discovered by Mayor and Queloz (1995). However, unlike UAP, these questions avoided being dismissed as “paranormal” and remained serious topics of inquiry. Moreover, with new technologies, the consensus has now shifted so that both (a) and even (b) are regarded as not only possible but a near *certainty* by most experts. The number of confirmed exoplanets in our galaxy is now above 5,000; moreover, NASA estimates the actual number could be more than 100 billion (Waichulis, 2023). Moreover, these numbers are for our galaxy alone, with NASA (2023) estimating the observable universe contains at least 2 trillion galaxies. Thus, if figures for our galaxy are applied across the cosmos, there could be 200 sextillion (200 billion trillion) extrasolar planets in the observable universe. Of course, not all may be habitable, which has historically been regarded as requiring a carefully calibrated “Goldilocks’ zone,” where conditions are “just right” (e.g., neither too hot nor cold). Even accounting for these parameters, though, such planets may be relatively common; some analyses suggest that *every* star could possibly host a habitable planet (Ojha et al., 2022).

Of course, even if life may be widespread, the question of intelligent or civilized forms is another matter entirely. Calculating its likelihood is difficult, attested to

by years of debates around the Drake Equation – of the number of detectable/contactable civilizations in the Milky Way (Drake et al., 2015) – and estimates vary wildly, depending on assumptions (Sandberg et al., 2018). Nevertheless, even if one stipulates, say, that the odds of a habitable planet actually producing intelligent life are a trillion to one – so vanishingly small as to be essentially non-existent – we could still have, per Ojha’s et al.’s suggestion that every star possibly hosts a habitable planet, up to 200 billion potential instances. Indeed, even if only one star in every *billion* had a habitable planet, this would still mean, based on the assumptions above, around 200 cases of intelligent life. As such, the scientific consensus now acknowledges intelligent life elsewhere does exist. Consider Bill Nelson, head of NASA, who is especially well-placed to comment: “My personal opinion is that the universe is so big, and now, there are even theories that there might be other universes. If that’s the case, who am I to say that planet Earth is the only location of a life form that is civilized and organized like ours?” (Todd, 2021, para. 3). Indeed, Westby and Conselice (2020) estimated the number of “Communicating Extra-Terrestrial Intelligent” civilizations just within our own galaxy, and even under the strictest criteria suggest there may be dozens.

Moreover, scholarship on UAP-adjacent areas is now encroaching onto the UAP question itself, expanding to consider the likelihood of such life actually engaging with Earth, hence being potentially responsible for UAP. This is still considered extremely unlikely due to the perceived difficulty of interstellar travel. Consider that our nearest stars, Alpha Centauri A and B, are 4.35 light years away. Our current fastest existing means of travel – Gravity Assist, which harnesses the relative movement and gravity of planets to accelerate a craft – would take 76,000 years to reach these (Williams, 2016). However, exponentially faster methods of travel are beginning to receive experimental testing. For example, an aerospace company (Pulsar Fusion) has begun construction of a nuclear fusion rocket engine, due for completion in 2027, that is predicted to create exhaust speeds of over 500,000 MPH (Sampson, 2023). Moreover, even faster methods are being developed. For example, NASA suggests a “laser sail” – ultrathin mirrors driven by focused energy beams – measuring 965 km in diameter could accelerate to half the speed of light in less than a decade. Work on such ideas is already underway, including “Project Starshot,” which plans to send a small sensory package to Alpha Centauri at 1/5 the speed of light (Parkin, 2018). Furthermore, even if such technologies are currently beyond our capacity, they may not be beyond civilizations who are more advanced. Physicists have speculated, for example, that it may be possible to exploit “wormholes” to take a “short

cut” through space (Frolov et al., 2023). Moreover, even if an interstellar voyage did take thousands of years, while impossible for biological organisms as we understand them, it would most certainly be feasible if the craft were piloted instead by AI systems, which Loeb and Kirkpatrick (2023) suggest is indeed the most likely scenario if some UAP really were extraterrestrial.

As such, even with UAP-adjacent topics, scientists have begun to broach the UAP question itself with more seriousness. Indeed, this possibility was recently recognized by NASA (2023), who, in 2022, set up a study team to explore the topic, which its recent report called “one of our planet’s greatest mysteries” (p. 7), one that “presents a unique scientific opportunity that demands a rigorous, evidence-based approach” (p. 3). Although it suggested there is currently “no conclusive evidence suggesting an extraterrestrial origin for UAP” (p. 25), it also notes that numerous UAP cases cannot at present be attributed to a conventional explanation, so an ETH is still on the table. In that respect, it acknowledges various possibilities, with “an intellectual continuum between extrasolar technosignatures, solar system SETI and potential unknown alien technology operating in Earth’s atmosphere. If we recognize the plausibility of any of these, then we should recognize that all are at least plausible” (p. 33). Moreover, recent developments are facilitating and even hastening such acknowledgments, as the second main part of this paper explores.

UAP: THE CONTEMPORARY RESPONSE

Recent years, especially since 2017, have seen a remarkable change in openness regarding UAP from the authorities. However, the scientific community has remained largely disengaged from the topic. Even there, though, there are signs that attitudes may be shifting, given the evidence emerging on the topic. This part explores these ideas over several sections: (1) developments on this topic since 2017, (2) political and military responses to allegations of a crash retrieval program, and (3) the response of the scientific community.

The Post-2017 UAP Era

Although the topic has generally been publicly downplayed by the authorities, especially since the late 1960s, this began to change in 2017, when footage of three military encounters with UAP was published online. This brought the topic to wider attention, especially following a *New York Times* article about AAWSAP, “Glowing Auras and ‘Black Money’: The Pentagon’s Mysterious U.F.O. Program” (Cooper et al., 2017). The military angle was especially significant. Prior to that point, there had

been numerous public sightings of UAP, with the Mutual UFO Network reportedly receiving over 200,000 since its founding in 1969 (Mellon, 2022). However, these have generally not been taken seriously by authorities and have tended to be dismissed, often just attributed to perceptual or cognitive error. However, reports emanating from the military are more credible for many reasons: they involve observers who have excelled in occupations that require the highest skill and training in visual perception and processing (e.g., fighter pilots), meaning they are regarded as higher-quality witnesses than the average observer; moreover, their testimony is often triangulated with other information sources (e.g., radar). Curiously, though, there is also a long history of UAP reports from non-military (e.g., commercial) pilots (Kean, 2010), yet even though they share many qualities of their military counterparts, their experiences did not have the same impact or significance for the authorities. Perhaps the difference is that military encounters have additional layers of interest and concern for authorities, such as vis-à-vis national security, which compelled their attention.

Whatever the dynamics, authorities began to take a more public and open stance. In April 2020, the Department of Defense (2020) confirmed the footage was genuine, prompting a *New York Times* article, “No Longer in Shadows, Pentagon’s U.F.O. Unit Will Make Some Findings Public” (Blumenthal & Kean, 2020). The next month, the US announced it was establishing a UAP Task Force charged with investigating these incidents, the latest iteration of which is known as the All-domain Anomaly Resolution Office (AARO). It has since produced three annual reports (Office of the Director of National Intelligence, 2021, 2023a, 2023b), albeit with limited scope (mainly events since 2019 and focusing on US airspace and littoral waters), as well as a historical review (AARO, 2024). In its initial 2021 report, of 144 events studied, in 143 cases, it determined we “lack sufficient information in our dataset to attribute incidents to specific explanations.” Its 2022 report (released in January 2023) examined a further 366 events, of which 177 similarly eluded identification and “demonstrated unusual flight characteristics or performance capabilities, and require further analysis.” Its most recent report in October 2023 – focusing on events up until April 2023 – added a further 291 cases, bringing the total to 801, noting “many reports from military witnesses do present safety of flight concerns, and there are some cases where reported UAP have potentially exhibited one or more concerning performance characteristics such as high-speed travel or unusual maneuverability.” Furthermore, the report suggests these cannot be attributed to the US (“AARO has de-conflicted these cases with potential US programs”) or its adversaries (“none of these UAP

reports have been positively attributed to foreign activities”). Speaking about the cases under review in May 2023, Dr Kirkpatrick, Director of AARO at the time, said he suspected most *did* have conventional explanations and only remained unidentified due to a lack of good data. However, around two to five percent – roughly 15-40 – were “possibly really anomalous” (Wendling, 2023).

Moreover, critics believe AARO may be deliberately downplaying the significance of the topic and the extraordinary nature of some evidence, following a trend with comparable previous investigations as discussed above. Boswell (2022) reported that a source in the Office of the Director of National Intelligence had told him, “They’re patting themselves on the back that they’ve resolved over half of them... But we don’t give a crap about the ones they’ve resolved. Yeah, there’s balloons up there, and balloons are sometimes mistaken for UAP. But there are s***loads of classified videos that are pretty profound and pretty clear. They don’t want to talk about this stuff, because they really, really don’t know what the hell they are” (para. 14-17). Indeed, in the eyes of many critics, AARO has become discredited as a genuine attempt to engage with the issue, instead seeming to serve - as per its predecessors - as a way of downplaying and denigrating the topic. In March 2024, for example, AARO (2024) released a Historical Record Report, purporting to cover more than 70 years of US records relating to UAP, which stated that it had “found no evidence that any USG investigation, academic-sponsored research, or official review panel has confirmed that any sighting of a UAP represented extraterrestrial technology.” In response though, many observers were scathing at what they regarded as a yet another official attempt to obfuscate the subject; indeed, Lue Elizondo (2024), former director of the AATIP program at the Pentagon, publicly accused the report of being “intentionally dishonest, inaccurate, and dangerously misleading.”

To that point, despite the blandishments offered by AARO, comments from key figures indicate the possibility of some UAP being truly extraordinary is being taken seriously. John Ratcliffe, for example, former Director of National Intelligence, said, “We are talking about objects that have been seen by Navy or Air Force pilots, or have been picked up by satellite imagery, that frankly engage in actions that are difficult to explain, movements that are hard to replicate, that we don’t have the technology for” (Lewis-Kraus, 2021, para. 11). Moreover, despite the efforts to investigate such phenomena, some are still perplexing authorities. Speaking in August 2023, for instance, General Mark Milley, Chairman of the Joint Chiefs of Staff, said the military “can explain a lot of it [i.e., UAP], but there is some that’s really kind of weird and unexplainable” (Wolfgang, 2023). It has even been reported

by Coulthart (2023) that, on 1st February 2023, 8-9 UAP were detected over the Arctic Circle, and fighter jets were sent to intercept, but the UAP “maneuver[ed] away, apparently at high speed.” Strikingly, the US government publicly admitted shooting down another UAP over Alaska on 10th February. Furthermore, Coulthart suggests it was genuinely “anomalous” (unlike a Chinese spy balloon shot down the previous week) and argues it is significant that over a year later, still no information or imagery has been released about it (also unlike the spy balloon). Such admissions already bring us into unusual ontological territory. However, in the summer of 2023 came some even more striking developments.

Grusch Allegations

In June 2023, dramatic claims regarding a UAP crash retrieval program were made publicly by David Grusch, as noted at the start. Our interest here is not the allegations per se (since these cannot yet be verified) but more the *reaction* to these, especially from scientists. In that respect, it is worth briefly reflecting on the *nature* of his claim, as this will help us contextualize and better understand the validity (or otherwise) of such reactions. A key claim made by skeptics is that neither Grusch nor those corroborating him have personally seen any such potential craft and are merely passing along unsubstantiated rumors. Grusch was challenged about this on BBC Radio 4 (2023) in August, accompanied by his attorney Charles McCullough III (notably, the intelligence community’s first Inspector General). He was asked, “But how do you know they [the government] have these items [i.e., craft], because you’ve not seen them yourself?” to which he said: “There are certain things I have first-hand access to that I can’t publicly discuss at this time. However, myself and other colleagues interviewed, you know, 40 individuals, both current and former highly distinguished intelligence and military personnel that were specifically on these programs, and those that were willing I directed to the Intelligence Community Inspector General, and so the Inspector General was able to interview people that do have direct, first-hand information.” The interviewer followed up, “Right, so they have that *information* directly. Have *they* actually seen these vehicles?” To this, Grusch replied, “The individuals that I directed to the Inspector General, yes, they have the first-hand experiences, yes.”

Summarizing the situation, Von Rennenkampff (2023b) suggested there are two main possibilities, both incredible: “Either the U.S. government has mounted an extraordinary, decades-long coverup of UFO retrieval and reverse-engineering activities, or elements of the defense and intelligence establishment are engaging in

a staggeringly brazen psychological disinformation campaign” (para. 2). A potential third option that “dozens of high-level, highly-cleared officials have come to believe enduring UFO myths, rumors and speculation as fact” appears “increasingly unlikely”: given “significant penalties for making false statements to an inspector general, it is extremely unlikely that multiple high-level, highly-cleared officials would falsely claim to have first-hand knowledge of myths and rumors.” Hence, the two main options presented by Von Rennenkampff, both of which are highly consequential. To that point, his allegations seem to have been taken seriously by lawmakers, most notably the proposed UAP Disclosure Act (U.S.C. S.2226, 2023), as introduced above. Explaining his motives, Schumer wrote, “The American public has a right to learn about technologies of unknown origins, non-human intelligence, and unexplainable phenomena” (Bolton, 2023, para. 3).

The Act is replete with striking language; even the title seems consequential, given that “disclosure” is the term UAP observers use for the process by which authorities, long suspected to have withheld evidence of non-human intelligence, release this information. Revealingly, the Act even alludes to Grusch’s allegation of a crash retrieval program – including authorities not only possessing UAP craft but actual non-human “pilots” – in referring to “legacy programs,” defined as “all Federal, State, and local government, commercial industry, academic, and private sector endeavors to collect, exploit, or reverse engineer technologies of unknown origin or examine biological evidence of living or deceased non-human intelligence” (p.6).

The impact of Grusch’s allegations was further illustrated by a Congressional hearing of the House Oversight Committee on July 26 (C-Span, 2023). There were three main witnesses testifying under oath: Grusch himself, plus two former Navy pilots, David Fravor and Ryan Graves, who have been vocal about UAP encounters they and their colleagues have experienced. The pilots’ testimony was striking, including discussions of how common military UAP encounters are. As Graves put it, “These sightings are not rare or isolated. They are routine. Military air crew and commercial pilots, trained observers whose lives depend on accurate identification, are frequently witnessing these phenomenon.” However, he also estimated only around 5% of these were formally reported by personnel to their superiors, mainly due to the “stigma” attached to the topic and related “fear” of various kinds (e.g., perceived as having mental health issues, thereby jeopardizing one’s career). However, even this newsworthy testimony paled in comparison to Grusch’s. Although unable to provide classified details in this public forum, he emphasized that he had provided these to the

Inspector General. Furthermore, he did offer some information about some claims. Asked, for example, “Do we have the bodies of the pilots who piloted this craft?” he replied, “Biologics came with some of these recoveries.” Questioned whether these were “human or non-human,” he said, “Non-human,” clarifying, “That was the assessment of people with direct knowledge on the program I talked to that are currently still on the program.” Such was the explosive nature of the hearing. However, the most pertinent question here is, how has the scientific community reacted to these events?

Scientific Reaction

Before exploring these reactions, it is worth reiterating the significance of these developments. After all, people make extraordinary claims all the time, and scientists are under no obligation to be open to all wild allegations that tend to be viewed as paranormal (or similarly dismissed with pejoratives like “conspiracy theory”). Here, the crucial point is not the allegations aired above, per se, but the context in which these have been made and the institutional processes that have unfolded in response, including the Disclosure Act and the Congressional hearing. Surely, even the most skeptical observer must admit these responses are unusual and mean the testimony of Grusch et al. cannot simply be summarily dismissed (e.g., as tall tales of uninformed cranks). Strikingly, though, this kind of dismissal has been all too evident in the scientific community. Gauging the reaction of the establishment per se is difficult since the events are too recent to have already generated the kind of institutional reactions seen in response to the Condon Report. However, hints are evident on social media platforms, which offer a faster indication of the sentiment of a given community.

Of course, since the scientific community is not a monolith, various responses were evident. Nevertheless, it was striking the extent to which well-known scientific figures – which to an extent can be regarded or at least perceived as the “voice” of the establishment – were not merely skeptical of the hearing but were outright dismissive as if the very possibility of even paying attention was ridiculous. This attitude was exemplified by two figures who are not only among the world’s most famous scientists but specialize in the very fields involved in this topic, Brian Cox and Neil deGrasse Tyson. Following the hearing, Cox (2023) expressed – to his 3 million “X” (formally Twitter) followers – a general disinterest in proceedings with a post that began, “I keep being asked what I make of the UFO thing in Congress yesterday, so here it is: I watched a few clips and saw some people who seemed to believe stuff saying extraordinary things without presenting ex-

traordinary evidence.” Tyson’s reaction was even more dismissive; in the week following, he only posted twice, both to mock the hearing. One concerned the poor quality of some publicly available evidence: “Sometimes I wonder whether alien space vessels are inherently fuzzy & out-of-focus (that would be terrifying)” (Tyson, 2023a). The other was to claim Grusch’s allegation about “biologics” were likely entirely prosaic: “To be clear, all animal, plant, and microbial life on Earth, minus humans, constitutes “non-human biologics.” (Tyson, 2023b). It would seem his skepticism lies partly in his belief – as reported by Sforza (2023) – that authorities would not be capable of concealing such secrets (“Do you think the government is that competent, that they can actually keep such a secret? Oh, my gosh, when did you get that much confidence in the U.S. government?”), and also that the public would be aware of any NHI incursion (“If we had an alien invasion... We would know about it... because everybody has a... high-resolution camera [i.e., on their smartphone]”). That said, he did acknowledge that “We have things we don’t understand in the sky,” so he conceded, “I think the government should investigate them ... because I don’t want to be susceptible to a risk that we don’t otherwise know about.” However, his tone overall was fundamentally dismissive.

Moreover, such attitudes seemed widespread, including those with expertise in the very topics connected to UAP. Most striking perhaps was Seth Shostak, senior astronomer at the SETI Institute, which, of course, is specifically interested in extraterrestrial intelligence, who, beyond just tweeting, took the effort to write an article for MSNBC mocking the hearing (Shostak, 2023). Wondering “Where is the evidence?” – of course, a reasonable question – he simply said, “It’s MIA. Neither Grusch nor anyone else claiming to have knowledge of secret government UAP programs has ever been able to publicly produce convincing photos showing alien hardware splayed across the landscape... The believers maintain that such photos exist but are being kept under wraps. For reasons that are always unclear, the critical evidence that would convince anyone of alien presence in our ‘hood is classified. It can’t be made public.” This reasoning overlooks the context of Grusch’s allegations, including that this evidence is classified and that Grusch *has* reportedly given it to the Inspector General and said he could provide it to politicians behind closed doors. Shostak maintained this tone in interviews on the hearing, joking with the LA Times about the possibility of interstellar travel (Petri, 2023): ““It’s very expensive to do that ... And aliens probably don’t have “unlimited amounts of alien money,” he added with a chuckle.””

It is one thing for the public to have this kind of dis-

missive reaction. Indeed, several articles highlighted the extent to which many people seemed uninterested in the hearing, such as a piece in *Forbes* titled “Nobody cares about David’s Grusch’s revelations” (Di Placido, 2023). However, from figures like Cox and Tyson (who study the cosmos), and especially Shostak (who has specifically focused on extraterrestrial intelligence), such dismissals are striking. Indeed, Grusch (2023) himself made this point, saying of Tyson, “He’s made up his mind. I’ve read his tweets, and I’m like, ‘Dude, you have a PhD in physics, where’s your curiosity!’” To be clear, skepticism regarding the hearing and the topic generally is not only reasonable but essential from a scientific perspective. However, these responses go beyond skepticism into dismissal and disinterest, which is arguably *anti*-scientific. This point was made by Von Rennenkampff (2023b) in an article entitled “NASA’s Approach to UFOs Appears Remarkably Unscientific.” He cited the NASA hearing mentioned above, particularly Dr Kirkpatrick’s remarks about the “orbs” being seen “all over the world... making very interesting apparent maneuvers.” As Von Rennenkampff writes, “Kirkpatrick’s comments should have immediately piqued the scientific curiosity of every individual in the room. How, after all, can spherical objects, lacking wings or apparent means of propulsion, remain stationary or travel at the speed of sound?” However, “not one of the NASA panel’s 16 members asked Kirkpatrick anything about his extraordinary comments. It raises the question: Are UFOs the death knell of scientific curiosity and inquisitiveness?”

This latter sentence is significant. Perhaps the most charitable explanation for the reaction to the hearing by figures like Cox and Tyson and of NASA panelists to Kirkpatrick is that as far as the dominant paradigm is concerned, UAP are still firmly in the paranormal box in which they were placed following Condon, alongside other phenomena long dismissed as non-existent, from ghosts to fairies. In that respect, the topic *needs* no engagement, just as scientists are not generally engaged in investigating the existence of fairies. To that point, we can see how dominant paradigms are tenacious and resistant to change while competing paradigms that are currently marginalized – such as one deeming UAP a genuine topic of inquiry – struggle to gain a foothold. However, the key question is whether UAP *still* deserves to be dismissed as paranormal or, conversely, whether these new developments mean they should be taken seriously. Indeed, numerous eminent figures have argued just that. Garry Nolan (2023a), for instance, took issue with people arguing the UAP hearing did not produce any evidence, writing, “People say they want evidence. Short of walking out of an NHI or flying a UAP over Congress in real time, please

define what you want to see? I mean it... state what you want? And how you would get it and believe it? I’ll give you my approach: So, what Congress is doing is the beginning of a scientific and forensic process. They are collecting verified data (see the UAP amendment) and getting sworn oaths, which will lead to and allow them to invoke investigatory powers. This is both a legal and a political process, but it uses tools of science.”

In this way, one can see how the scientific community could and *should* engage with the topic in a skeptical, open-minded way. Indeed, as emphasized by Nolan, we *need* engagement from scientists, especially given how elusive and confounding many UAP data points appear to be. It can even be helpful to hear from skeptics of extraordinary explanations for UAP, provided they engage in a spirit of genuine inquiry rather than simply seeking to “debunk” according to an *a priori* dismissal of the ETH. Mick West, for instance, has skillfully demonstrated that some UAP cases most likely are prosaic (Boswell, 2023), yet also seems to avoid evidence that conflicts with his own interpretations (Phelan, 2023), so his contribution overall is ambiguous, and on balance risks turning people away from taking the subject seriously.

This claim was put directly to West by Eric Weinstein on Curt Jaimungal’s (2022) podcast, in an episode titled “UAPs, evidence, skepticism,” and he somewhat conceded the point. However, among the scientific community overall, arguably, sentiments are now shifting, perhaps in relation to developments like the Task Force. One indication is a survey by Yingling et al. (2023) of 1460 faculty at elite US institutions between February and April 2022. The vast majority were not particularly aware of the topic: asked, “In the past several years how often have you heard news about the UAP topic?,” 85% said either never (6.3%), rarely (30.27%) or just occasionally (48.7%), while *vis-à-vis* seeking out such news, 94% said either never (42.9%), rarely (31.8%), or occasionally (19.32%). However, in terms of *curiosity* about the topic, only 17.2% were “not curious,” while the vast majority either “slightly” (25.41%), “moderately” (25.34%), “very” (16.78%), or “extremely” (15.27%) curious. Commenting on this, Nolan (2023a) said, “Legitimacy around the subject matter-- and bringing a professional and scientific/sociological and ... dare I say... religious perspective is increasing. Academics are starting to do what matters-- paying attention and not dismissing the subject matter outright. The increasing number of emails and communications from colleagues now beginning to open their eyes to this, and rejecting knee-jerk pseudo-skepticism is astonishing to me.”

There may still be work to do, as exemplified in an article in *Scientific American* by Kloor (2023), “How Wealthy UFO Fans Helped Fuel Fringe Beliefs: There is a Long U.S.

Legacy of Plutocrat-Funded Pseudoscience. Congress Just Embraced It.” Indeed, even scientists close to the topic seem to retain a wary skepticism; Avi Loeb, for instance, was asked about Grusch and dismissively said, “So, this David Grusch guy is basing his entire claim on conversations that he had,” not “actual evidence” (Hawgood, 2023, para. 45). Likewise, when asked about a documentary on Grusch, he said, “We need to look through telescopes and be collecting data through instruments, not through people talking about it on social media... Somebody interviewing another guy who tells the story — who cares?” (para. 46). As noted above vis-à-vis similar dismissals from Shostak, Grusch *has* provided evidence to relevant authorities but cannot share this publicly. Thus, for someone of Loeb’s intelligence and interest to trivialize his allegations suggests he has not followed the story closely (as he himself admits in the article), perhaps because it seems too sensationalistic to be credible, which indeed is a reasonable assumption. However, given the developments of recent years, perhaps all scientists are on journeys of re-evaluating assumptions, moving at varying speeds with respect to different aspects of the phenomenon but crucially with their overall stance shifting towards greater openness and interest. Indeed, Loeb himself subsequently said he was starting to take Grusch’s allegations more seriously. In an interview with Chris Cuomo (2023) in December, he revealed he had just spoken with Grusch for over an hour about “how scientists could get engaged” with the claims and issues raised by Grusch. Indeed, Loeb said that he himself “would love to know more about what the government has, and you know I’m willing to go through any hoops that are required to [get] access to those materials.”

Similarly, even in hitherto skeptical institutions, the tide may be shifting; in contrast to the tone of Kloor’s article, *Scientific American* also more recently published a piece titled, “It’s Time to Hear From Social Scientists About UFOs” (Eghigan & Peters, 2023), which argues that, “We don’t conclusively know if UAP physically exist beyond the mundane, but we do know this: UFOs are social facts... Social scientists should weigh in on UAP, now.” (para. 5-6). Such sentiments align with the arguments in this paper and perhaps indicate that the developments being encouraged here are already starting.

DISCUSSION

UAP have long been dismissed as a topic of serious scientific interest, especially following the Condon Report, which asserted these likely had a prosaic explanation and did not merit further scrutiny. Subsequently, the topic was relegated to the paranormal, a category for phenomena that some people believe exist and should be

studied but which the scientific establishment has adjudicated is not real and hence not of empirical interest. Some scientists have still taken an interest in the topic, whether in a fringe or secret way or exploring adjacent areas (such as the possibility of extraterrestrial life). However, it retains the stigma of the paranormal and remains outside the boundaries of serious inquiry. However, recent years have seen various developments that warrant re-thinking this position, including the establishment of the UAP Task Force and, more recently, the allegations of David Grusch, followed by the proposed UAP Disclosure Act and the Congressional hearing in July. Of course, none of these developments mean that UAP are *necessarily* extraordinary. Surely, though, they carry enough weight and significance to encourage scientists to at least engage seriously and revisit the assumptions that may cause them to dismiss the topic.

Indeed, the history of science is replete with instances in which establishment figures and institutions confidently dismissed phenomena that seemed improbable from within the dominant paradigm but which subsequently proved to be genuine. For example, right up until the Wright Brothers made their first successful flight in 1903, many scientists were adamant such a feat was against the “laws of physics.” Most famously, Lord Kelvin – mathematical physicist, engineer, and President of the Royal Society of England – declared in 1895, “I can state flatly that heavier-than-air flying machines are impossible” (cited in Winston, 2002, p. 292). As such, we should not only be wary of assuming the current state of scientific knowledge is complete but should expect it is *not*, so with humility and curiosity, keep an open mind to possibilities, even if they seem highly unlikely at present. Indeed, new scientific and technological advances are constantly bringing forth new discoveries about the cosmos, such as the detection of the gravitational wave “background” of the universe (Eureka Alert, 2023). This point about openness was emphasized by Loeb (2023b) in relation to his mission to recover the interstellar spherules. He admitted he could easily have “decided not to pursue this project because of the extreme pushback from “experts” on space rocks who were “sick about hearing Avi Loeb’s wild claims,” according to a *New York Times* article and a *New York Times Magazine* profile. However, the success of the expedition illustrates “the value of taking risks in science despite all odds as an opportunity for discovering new knowledge,” with the spherules providing “a wake-up call from afar, urging astronomers to be more curious and open-minded.” Thus, given recent developments regarding UAP, the topic now surely warrants at least serious engagement from the scientific community.

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