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"LIKE ANOTHER ST BASIL": ASTRONOMY, ORTHODOX APOLOGETICS AND ANTICOMMUNISM IN TWENTIETH-CENTURY GREECE

Kostas Tampakis

Abstract: This article investigates the ideological instrumentalisation of astronomy within twentieth-century Greece, centring on the work of Dimitrios Kotsakis (1909–1986) and, secondarily, Stavros Plakidis (1893–1991). The study demonstrates how Greek astronomers functioned as active agents, reframing scientific practice to serve specific apologetic and political agendas. By recontextualising pre-existing antimaterialist discourses, these figures perpetuated an ideological struggle against materialism and socialism that long predated the geopolitical Cold War, but which contributed to it. Ultimately, the article argues that Kotsakis and his milieu successfully synthesised disparate intellectual fields – scientific, religious and political – to wage what was essentially a Cold War anticommunist crusade, yet one deeply rooted in a distinctively Greek context.

A Celebratory Meeting and Two Honorary Volumes

On 22 May 1973, the Eugenides Foundation Planetarium hosted a celebratory event for its main scientific advisor, Astronomy Professor Stavros Plakidis (1893–1991). His colleagues, friends, associates and students gathered to honour his 80th birthday, and their speeches were published in a special *in honorem* volume.[1]

Plakidis was indeed the calibre of scientist that a planetarium would celebrate. Born in 1893 in Istanbul, he was initially educated at the Phanar Greek Orthodox College in 1911. He earned a degree in mathematics from the University of Athens in 1915, and a few years later began working as an assistant in the National Observatory of Athens. In his long career, he worked at numerous British, French and German observatories (including the Royal Observatory at Greenwich), and he became *the* professor of astronomy in the University of Athens, *the* director of the National

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[1] Dimitrios Kotsakis, ed., *Εις τιμήν Σταύρου Μ. Πλακίδου* (Athens: Laboratory of Astronomy, 1974).

Observatory in Athens and *the* scientific advisor of the Eugenides Foundation. He also founded and equipped the Penteli Observatory, the second observatory to be built in Greece after the one in Athens. His summer residence, which he built near the Penteli Observatory, remains a local landmark. For all intents and purposes, in the eyes of the Greek nation, the Greek state and the international scientific community, Plakidis was *the* Greek astronomer.[2] Consequently, the festschrift is filled with papers on metric geometry, the properties of quasars, formal integrals of Hamiltonians and the influence of sunspots on rainfall. However, it also contains addresses by his colleagues in the university and the National Metsovian Polytechnic School, as well as a biographical panegyric from his successor, Dimitris Kotsakis (1909–1986). In these addresses-turned-texts, we read that Plakidis was "tireless, careful and conscientious", "an exemplary human, teacher-professor and … mentor" and "a rare synthesis of a noble soul, rare intellectualism, deep erudition and calm manners".[3] Of particular interest, however, are the specific references to political actions taken by the venerable professor. As Alexandros Makridis, the president of the Union of Graduates of the Phanar Greek Orthodox College, says: Plakidis "bravely faced the gunshots and missiles of the foreign-led communist bandits that were fighting the national forces outside the Observatory".[4]

Later on, Dimitrios Kotsakis, in his biographical speech, specifically identified three areas that Plakidis was active in: science and research, academia and writing, and politics and society. On the latter, he notes:

> Professor Plakidis … was raised on a family environment truly Greek and Christian … in which the Christian faith, the national Greek tradition and the Byzantine spirit was cultivated … and [he] thus formulated … the belief that his scientific mission could not be contained in the tight constraints of pure research … [He started giving lectures] transmitting astronomical knowledge, a truly Greek spirit, a general view of the Universe, metaphysical thought and faith in God.[5]

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[2] This short abridgement of Plakidis' career is based on Certificate 13559/1 October 1964, Stavros Plakidis Personnel File, Historical Archive of the National and Kapodistrian University of Athens; Dimitrios Kotsakis, "Η ζωή και το έργον του κ. Στ. Πλακίδη," in Kotsakis, *Εις τιμήν Σταύρου Μ. Πλακίδου*, 7–16, and George Contopoulos, "S. Plakidis (22 May 1893–30 January 1991)," *Quarterly Journal of the Royal Astronomical Society* 32, no. 4 (1991): 483–84.

[3] The quotes are from the addresses of Prof. Leonidas Karapiperis (2), Prof. Ioannis Argyrakou (5) and Alexandros Makridis (6), respectively, in *Εις τιμήν Σταύρου Μ. Πλακίδου*. All translations from Greek throughout the article are mine.

[4] Alexandros Makridis, "Προσφώνησις," in Kotsakis, *Εις τιμήν Σταύρου Μ. Πλακίδου*, 6.

[5] Kotsakis, "Η ζωή και το έργον του κ. Στ. Πλακίδη," 14

In his response, Plakidis tacitly accepts the accolade

> It was a great joy that, during the [Nazi] occupation … the scientific instruments escaped seizure, but I was subsequently crushed by the following maelstrom of banditry.
>
> Living with my family inside the Institution, I managed, with the help of Divine Providence and under crossfire and with the threat of becoming a hostage, by risking my life and that of my wife, to save whatever was humanly possible to save. I thus experienced what a captain experiences when his ship is about to capsize and I mourned the loss of … Anastasios Diamantopoulos, who was a victim of the bandit raids.[6]

The term "foreign-led communist bandits" employed here is a familiar one. It served as the official designation for all communist-led forces that took part in the Greek Civil War, remaining in use from the late 1940s to the early 1980s. From the perspective of the Greek state, a civil war had never occurred; instead, national forces were engaged against traitorous common bandits who constituted a blight on the nation.[7] In 1973, during the final years of the rabidly anticommunist Greek junta in which these lectures were delivered, neither the meeting participants nor Plakidis shied away from such rhetoric.

Fifteen years later, in 1988, another honorary volume for a Greek astronomer was published. This time, the volume was in memoriam of Dimitris Kotsakis, who had passed away two years earlier. Kotsakis, the author of the panegyric for Plakidis in the 1974 volume, had also succeeded Plakidis as *the* preeminent Greek astronomer. Kotsakis became, in turn, the director of the National Observatory, the professor of astronomy at the University of Athens, the author of several school and university textbooks on astronomy, and the scientific advisor of the

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[6] Stavros Plakidis, "Απάντησις καθηγητού κ. Στ. Πλακίδη," in Kotsakis, *Εις τιμήν Σταύρου Μ. Πλακίδου*, 18.

[7] On the rhetoric of the Greek Civil War, see Stratis Bournazos, "Το κράτος των εθνικοφρόνων: Αντικομμουνιστικός λόγος και πρακτικές," in *Ιστορία της Ελλάδας του 20ού αιώνα*, vol. D2, *1945–1952: Ανασυγκρότηση – εμφύλιος – παλινόρθωση*, ed. Christos Hadziiossif (Athens: Vivliorama, 2009), 9–49; Bournazos, "Ο αναμορφωτικός λόγος των νικητών στη Μακρόνησο: Η ένταξη του εμφυλίου στην προαιώνια ιστορία της φυλής, ο 'διηθητός ιός' του κομμουνισμού και ο ρόλος της 'αναμόρφωσης'," *Δοκιμές 6* (1997): 101–34; Polymeris Voglis, *Becoming a Subject: Political Prisoners during the Greek Civil War* (Oxford: Berghahn, 2002); Alexander Kazamias, "The Visual Politics of Fear: Anti-Communist Imagery in Postwar Greece," *Journal of Contemporary History* 57, no. 4 (2022): 997–1028, and Raymond Alvanos, "Η επικοινωνία του πολέμου και ο πόλεμος της επικοινωνίας: Ο πολιτικός λόγος των δύο αντιπάλων του ελληνικού εμφυλίου μέσα από τον τύπο," *Μνήμων* 40 (2023): 141–64.

Eugenides Planetarium. Although he did not study abroad, he travelled regularly to participate in observations in Hamburg, Dublin, Heidelberg and elsewhere. Kotsakis also succeeded in establishing and equipping a third observatory on the hills of Mount Kyllini at Kryoneri, Corinthia, in 1972 – an accomplishment hailed as one of his major achievements.[8] Fittingly, the volume contains papers from colleagues and students on subjects such as the general non-planar three-body problem, electron-molecule atmospheric interactions and comet plasma environments. It also includes biographical papers by Plakidis himself, who outlived his student, and by Kotsakis and Plakidis' scientific successor, George Contopoulos. As might be expected, Kotsakis is described as one of the founders of observational astronomy in Greece, an internationally acknowledged polyglot who mentored younger astronomers, a man of "impeccable morals, integrity of character, humbleness, scientific capability and devotion to duty".[9] We also learn that during the Nazi occupation, Kotsakis was part of the royalist resistance group Kodros, utilising his knowledge of German to identify antiaircraft and weather equipment installed on the observatory premises.[10] Yet once more, it is noteworthy that Plakidis, Kotsakis' mentor, specifically identifies five areas of Kotsakis' work. Alongside mathematics, astronomy, history of science and science communication, Plakidis says:

> D. Kotsakis worked in one more area: the social and cultural one. He was a founding member of the Christian Union of Scientists and cowrote its Manifesto. He was a member of the Greek Light, the Apostle Paul School of Mechanics, the Christian Social Union and other associations … He gives lectures, transmitting astronomical knowledge, a general viewpoint of the Universe, a metaphysical thought and belief in God. He is the opponent of materialism and atheism and, following the example of St Basil, he wields the wonders of the Sky as weapons against astrologers and Astrology.

[8] His biographical details are based on Certificate 1986/7 October 1965, Dimitrios Kotsakis Personnel File, Historical Archive of the National and Kapodistrian University of Athens; Stavros Plakidis, "Δημήτριος Διονυσίου Κωτσάκης," in *Εις μνήμην Δ. Κωτσάκη*, ed. George Contopoulos, Vassilis Barbanis and Pavlos Laskarides (Athens: s.n., 1988), 9–13, and George Contopoulos, "In memoriam Demetrios Kotsakis," Mitteilungen der Astronomischen Gesellschaft 70 (1987): 11–12.

[9] Plakidis, "Δημήτριος Διονυσίου Κωτσάκης," 12; George Contopoulos, "Ο Δ. Κωτσάκης σαν επιστήμων," in Contopoulos, Barbanis and Laskarides, *Εις μνήμην Δ. Κωτσάκη*, 14–24.

[10] Contopoulos, "Ο Δ. Κωτσάκης σαν επιστήμων," 20–21. The story is corroborated by a classified report signed by the Kodros commander Lykourezos in Kotsakis' personnel file, see Report 2442/23 August 1945, Dimitrios Kotsakis Personnel File, Historical Archive of the National and Kapodistrian University of Athens.

> Having been raised in a truly Christian family environment, he lived a monastic life, living communally alongside the members of the Zoe Brotherhood of Theologians.[11]

The era of the PASOK government in the 1980s was not one to invite discussions of communist bandits, yet it is notable that Plakidis repeats verbatim the very phrases Kotsakis had used to describe him two decades earlier. Here, again, we see an astronomer, *the* Greek astronomer of his era, specifically mentioned as an opponent of atheism and materialism, a populariser, a lover of metaphysics and a passionate defender of God. Kotsakis is not there to accept the praise, but his successor, Contopoulos, is. Contopoulos then went on to write an *in memoriam* article for the astronomy journal *Mitteilungen der Astronomischen Gesellschaft,* in which he writes that "D. Kotsakis was a devoted member of the Greek Orthodox Church. He believed in the harmony between science and religion. He never married and devoted himself to the service of others."[12]

Science and its Cold War Localities

How should these persistent descriptors be unpacked? How are we to explain that, for most of the twentieth century, the most notable Greek astronomers were praised by their colleagues, mentors and students as being antimaterialists, fierce proponents of Christianity and members of the most notorious Christian para-ecclesiastical organisations of their era? Kotsakis' case, on which we will focus, is especially interesting, since he not only acted as a conservative/reactionary intellectual, but also lived a monastic communal life under the auspices of the Zoe Brotherhood, one of the major religious and anticommunist organisations of the twentieth century.[13] An easy answer would be to say that reactionaries will

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[11] Plakidis, "Δημήτριος Διονυσίου Κωτσάκης," 12. I have opted not to translate the name the Zoe Brotherhood to "Life Brotherhood", since this is how it most often appears in the relevant historical literature.

[12] Contopoulos, "In memoriam Demetrios Kotsakis," 11–12.

[13] On the role of the Zoe Brotherhood, see, for example, Christoph Maczewski, *Die Zoi-Bewegung Griechenlands: Ein Beitrag zum Traditionsproblem der Ostkirche* (Göttingen: Vandenhoeck und Ruprecht, 1970), translated into Greek and published by Armos in 2002; Vasilios Makrides, "Orthodoxy in the Service of Anticommunism: The Religious Organization Zoë during the Greek Civil War," in *The Greek Civil War: Essays on a Conflict of Exceptionalism and Silences*, ed. Phillip Carabott and Thanasis D. Sfikas (London: Routledge, 2004), 159–74; Amaryllis Logotheti, "The Brotherhood of Theologians Zoe and its Influence on Twentieth-Century Greece," in *Orthodox Christian Renewal Movements in Eastern Europe*, ed. Aleksandra Djurić Milovanović and Radmila Radić (Palgrave Macmillan, 2017), 285–302, and Amaryllis Logotheti, "The Religious Justification of Anti-Communist Persecutions

react, preachers will preach and old white male academics will have pastimes, be they astronomers or otherwise. Such an answer, however, would a priori downplay the importance of the persistence of such narratives and practices. It would mean a tacit acceptance of a positivist interpretation of what science is and what scientists do, as something that can only be confined to theories, laboratories and data and, thus, not as a practice that can be wielded by its adherents and opponents for ideological causes.[14] A more complicated answer, in the sense of John Hedley Brooke's notion of complexity, would be to treat these as "actors' categories" and try to recover why these people employed and accepted such descriptors, in light of the social, cultural and political milieu of their era.[15] This article argues that we can go a step further, and problematise the boundaries of scientific and nonscientific work themselves. Taking Kotsakis' work and public writings as a case study, I will describe how astronomy became a vehicle for Orthodox rhetoric, how it was weaponised against communism during the Civil War and Cold War eras in Greece, and how scientific expertise was mobilised in these efforts.

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in Greece (1920–1949)," in *The Palgrave Handbook of Anti-Communist Persecutions*, ed. Christian Gerlach and Clemens Six (Cham: Springer, 2020), 329–45; Alexandros Gousidis, *Οι χριστιανικές οργανώσεις: Η περίπτωση της αδελφότητας Θεολόγων "Η Ζωή" – κοινωνιολογική προσέγγιση* (Thessaloniki: Pournara, 1993).

[14] In fact, in the last 50 years, historians of science have provided several examples of such value-laden uses of the natural sciences. The literature on the interplay between ideology, values and the emergence of modern science is vast, and spans the period from the so-called "Scientific Revolution" of the seventeenth century to the present. Exemplary such works are Steven Shapin and Simon Schaffer, *Leviathan and the Air-Pump: Hobbes, Boyle, and the Experimental Life* (Princeton: Princeton University Press. 1985); M. Norton Wise and Crosbie Smith, "Work and Waste: Political Economy and Natural Philosophy in Nineteenth Century Britain (I)," *History of Science* 27, no. 3 (1989): 263–301, and "Work and Waste: Political Economy and Natural Philosophy in Nineteenth Century Britain (II)," *History of Science* 27, no. 4 (1989): 391–449; Mario Biagioli, *Galileo, Courtier: The Practice of Science in the Culture of Absolutism* (Chicago: University of Chicago Press, 1993); Lorraine Daston and Peter Galison, *Objectivity* (Princeton: Princeton University Press, 2021). See also M. Norton Wise, ed., *The Values of Precision* (Princeton: Princeton University Press, 1995); Graeme Gooday, *The Morals of Measurement: Accuracy, Irony, and Trust in Late Victorian Electrical Practice* (Cambridge: Cambridge University Press, 2004) and Jaume Navarro and Kostas Tampakis, eds., *Science, Religion and Nationalism: Local Perceptions and Global Historiographies* (London: Routledge, 2023).

[15] On the complexity thesis, see John H. Brooke, "Science, Religion, and Historical Complexity," *Historically Speaking* 8, no. 5 (2007): 10–13, and the discussion in Bernard Lightman, ed., *Rethinking History, Science, and Religion: An Exploration of Conflict and the Complexity Principle* (Pittsburgh: University of Pittsburgh Press, 2019), especially the "Introduction" by Lightman and the "Afterword: The Instantiation of Historical Complexity" by Brooke.

This article covers a period from the late 1930s to the late 1970s, with a special focus on the years from 1946 to 1974. This period coincides with the Greek Civil War and its aftermath, up to and including the period of the 1967–1974 junta, as well as with the broader period of the Cold War. Thus, it is broadly part of a growing number of recent studies on the role of science in the Cold War.[16] However, such scholarship has mostly focused on the USSR–USA dipole, with other spaces' histories treated as mere reflections of, and reactions to, what was taking place in those states. This article will argue otherwise, and try to describe which local resources, networks and types of social and cultural capital – to use the Bourdieusian terms – were utilised. Scholars and scientists like Kotsakis did not wait for the Cold War to pursue their apologetic mission on behalf of Orthodox Christianity. They were active in the field several decades earlier, and continued to be so after the Cold War subsided. In the same vein, the effects of the Cold War on Greek social and cultural life have gained increased historiographical recognition. Several historians have traced how Cold War funding, values and actors shaped Greek cultural and intellectual life.[17] However, science and scientists in Greece are very rarely the focus of such discussions, despite the explicit importance that both the USSR and the USA placed on science during this era.[18] Thus, this article aims

[16] See, for example, John Krige, *American Hegemony and the Postwar Reconstruction of Science in Europe* (Cambridge: MIT Press, 2008); Audra J. Wolfe, *Competing with the Soviets: Science, Technology, and the State in Cold War America* (Baltimore: Johns Hopkins University Press, 2013); Naomi Oreskes and John Krige, eds., *Science and Technology in the Global Cold War* (Cambridge: MIT Press, 2014); Audra J. Wolfe. *Freedom's Laboratory: The Cold War Struggle for the Soul of Science* (Baltimore: Johns Hopkins University Press, 2018); Creg Whitesides, *Science and American Foreign Relations since World War II* (Cambridge: Cambridge University Press, 2019) and Oreskes, *Science on a Mission: How Military Funding Shaped What We Do and Don't Know about the Ocean* (Chicago: University of Chicago Press, 2021).

[17] See, for example, Zinovia Lialiouti, "Greek Cold War Anti-Americanism in Perspective, 1947–1989," *Journal of Transatlantic Studies* 13, no. 1 (2015): 40–55; Lialiouti, *Ο "άλλος" Ψυχρός Πόλεμος: Η αμερικάνικη πολιτισμική διπλωματία στην Ελλάδα, 1953–1973* (Heraklion: Crete University Press, 2019); Alexander Kazamias, *Greece and the Cold War* (London: Bloomsbury, 2022); Areti Vasileiou, "*Η τέχνη στο τέλος της ιδεολογίας": Η αμερικάνικη πολιτιστική διπλωματία, το Ίδρυμα Ford και το Θέατρο Τέχνης του Καρόλου Κουν την εποχή του Ψυχρού Πολέμου και της δικτατορίας* (Athens: Amolgos, 2022); Stratis Bournazos, *Η ιστορία μιας ματαίωσης: Το CFC και ο πολιτιστικός Ψυχρός Πόλεμος στην Ελλάδα* (Athens: Antipodes, 2024); Christos Mais, "Serving Two Masters: Cold War Diplomacy in 1960s Greece," in *Book Diplomacy in the Cultural Cold War*, ed. Esmaeil Haddadian-Moghaddam and Giles Scott-Smith (Leiden: Brill, 2025), 153–75, and Kostas Ioannidis, *Έργα τέχνης, άνθρωποι και ιδέες: Ελλάδα–ΗΠΑ και Ψυχρός Πόλεμος* (Athens: Futura, 2025).

[18] The focus so far has been on nuclear Cold War diplomacy. See, for example, Maria Rententzi, "Gender, Science and Politics: Queen Frederika and Nuclear Research in Post-

to address this historiographical lacuna, by focusing on the ideological uses of astronomy by Greek astronomers themselves. It also seeks to show how Greek astronomers were active agents in reframing astronomy for their intellectual goals, using and recontextualising earlier antimaterialist discourses to continue an ideological struggle that preceded them. In the end, Kotsakis and his milieu managed to synthesise different discourses and intellectual fields, to pursue what was essentially a Cold War anticommunist crusade in a very Greek context.

Kotsakis and his Work

Kotsakis lived a more prolific life than his short biography offered above would suggest. He was born in the small town of Filiatra, Messenia, in 1909. In 1927, he started his studies in the School of Physics and Mathematics of the University of Athens, from which he graduated with a degree in mathematics in 1931 and started working in the National Observatory, having already attracted the attention of Plakidis. By then, both men were active in Orthodox unions and clubs, and Kotsakis was a member of the Academic Social Union in 1933, the first organised Orthodox student association. By then, he had probably met with his future collaborator in the Zoe Brotherhood and the Christian Union of Scientists, the upwardly mobile Alexandros Tsirintanis (1903–1977), already a reader in commercial law in the University of Athens. It is worth repeating that Kotsakis not only joined the brotherhood as a brother, but lived in its communal lodgings until the end of his life. He was a founding member and a member of the board of the Greek Light organisation, which was spearheaded by Tsirintanis, and which

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war Greece," *Centaurus* 51, no. 1 (2009): 63–87; Maria Rentetzi, "'Reactor is Critical': Introducing Nuclear Research in Post War Greece," *Archives internationales d'histoire des sciences* 60, no. 164 (2010): 137–54; Rentetzi, "With Strings Attached: Gift-Giving to the International Atomic Energy Agency and US Foreign Policy," *Endeavour* 45, no. 1–2 (2021): 100754. See also Loukas Freris, "Bringing Small Devices, Giving Design Advice: Introducing Radiation Protection Practices in Greece via the IAEA's Visiting Professor Program," *Berichte zur Wissenschaftsgeschichte* 48, no. 1–2 (2025): 91–111; Freris and Rentetzi, "'One Woman Started It All': Gendered Approaches to the Governance of Knowledge in Post-War Greece," in *Women, Gender, and Technosciences, 1900–2020*, ed. Grégory Dufaud and Isabelle Lémonon-Waxin (London: Routledge, 2025), 141–60; Rentetzi and Freris, "How to Turn a Mobile Laboratory into a Diplomatic Bag: International Relations, the IAEA and Nuclear Diplomacy," *History and Technology* 41, no. 1 (2025): 1–26. For the interplay between Orthodox Christianity and science during the Cold War, see Kostas Tampakis, "Science as an Orthodox Weapon and the Politics of Anti-Communism in Mid-Twentieth Century Greece," in *Orthodox Christianity and the Study of Nature: Histories of Interaction*, ed. Kostas Tampakis and Ronald Numbers (Turnhout: Brepols, 2025), 171–95.

became the most widespread and militant anticommunist organisation in 1950s and 1960s Greece.[19] Kotsakis remained a loyal Zoe Brotherhood member even when his longtime friend and associate Tsirintanis, as well as other founding members, left it in 1959, in the succession struggles that followed Archimandrite Seraphim Papakostas' death in 1954. Because of his work with the brotherhood, Kotsakis was even brought before a court and convicted in 1964, after a lawsuit was filed against him by ex-member and notable theologian Panagiotis Trempelas, who protested the use of his works by the brotherhood.[20] Despite retiring in l974, Kotsakis remained an active author and lecturer, publishing books well into the 1980s and up until his death.

Kotsakis' published work is impressively extensive, in scope and volume. Contopoulos credits Kotsakis with 28 publications in pure mathematics and in theoretical and observational astronomy and 18 more scientific journal articles, mostly in Greek journals.[21] He also authored nine studies on the history of science in the Greek-speaking space, mostly on the history of astronomy during the Byzantine era and in the seventeenth and eighteenth centuries. Finally, Kotsakis published 19 books, five of which are textbooks and the rest are popular expositions on astronomy, broadly understood. What is missing from this account is perhaps his most enduring body of work, which in fact formed the backbone of most of his other endeavours: his contributions to the journal *Ακτίνες*.

The Christian Union of Scientists (Χριστιανική Ένωση Επιστημόνων, or CEE) was founded in 1937 by Tsirintanis and the head of the Zoe Brotherhood, Archimandrite Seraphim Papakostas (1892–1954), one of the main "specialist" groups that the brotherhood organised at the time. The CEE, however, was based on the scholarly group around Tsirintanis, who were already collaborators and friends, and included Tsirintanis' brother-in-law Psychiatrist Aristos Aspiotis (1910–1983), the future junta archbishop Ieronymos Kotsonis (1905–1988) and others. They were joined by members of the Zoe Brotherhood like the theologian Panagiotis Trempelas (1886–1977), the theologian and poet Alexandros Gialas (1915–1948, whose nom de plume was G. Veritis) and, of course, Kotsakis himself, the only founding member of the CEE with any scientific expertise. The CEE's main activity was the publishing of the journal *Ακτίνες*, a journal devoted to "informing the Greek public of the turn of European thought towards spiritual

[19] For the role of the Greek Light and its ties to the Christian Union of Scientists, see Tampakis, "Science as an Orthodox Weapon," 200–10.

[20] "Ποιναί με αναστολην εις υπευθύνους της 'Ζωής'," *Μακεδονία*, 19 June 1964, 7.

[21] Contopoulos, "Ο Δ. Κωτσάκης σαν επιστήμων," 21–24.

values and … the overcoming of theoretical materialism".[22] Contributors picked pseudonyms, often multiple ones, from the first disciples of Apostle Paul, or from saints or even place names that hinted at their profession. Taking Tsirintanis as an example, he wrote as P. Dalmas, Zinas Nomikos, Vassileios Ploumidis or, more often, as P. Melitis. His brother-in-law Aspiotis was A. Galenos, K. Damianos or "The Psychiatrist", while Kotsakis himself wrote under the names Sergios Pavlos and K. or D. Pentelikos, referencing the site of the observatory in which he worked.[23] Considering his various pen names, Kotsakis wrote more than 100 articles for *Ακτίνες* over a time span of 45 years, most of them between 1940 and the late 1960s, making an average of three articles per year. He wrote popularising articles, notes, book reviews and correspondence, thus engaging with all the forms of writing that *Ακτίνες* would publish, excluding poetry and novellas. The range of issues he tackled were not only science popularisation, but also the history of science, commentaries on current political events such as the Greek Civil War and philosophy.[24] In fact, Kotsakis' *Ακτίνες* articles appear to form the backbone of his political, intellectual and ideological thought. Many of the opinions and arguments that later appear in his other publications were first expressed in *Ακτίνες*, often in identical form. As a result, the work of people like Kotsakis can only be properly understood if examined holistically. It is no accident that his closest collaborators and colleagues included all these aspects of their work in their eulogies and panegyrics for each other.

Kotsakis, Ακτίνες *and the Christian Union of Scientists*

It is important to note that a significant part of Kotsakis' not-strictly academic writing was devoted to presenting and explaining astronomical knowledge to lay religious and nonreligious audiences, without strong ideological overtones. In *Ακτίνες*, there are several articles that could have appeared in any newspaper of his era, the only indication of their context being the very mild mentions of a Great Artist, or a plea for material and spiritual growth to go hand in hand. This was thus science popularisation for a religious, nonspecialist audience.[25] Conversely, many of his books, like *Ήλιος και Γη* (Sun and earth), first published in 1962, and

[22] Vassilis Stathakis, "Από την ιστορία του περιοδικού," in *Ευρετήριο "Ακτίνων", τόμοι: 1938–1997*, ed. Vassilios Charalampopoulos (Athens: Aktines, 1998), 11.

[23] Giannis Athos, *Ανίχνευση–αποκρυπτογράφηση ψευδωνύμων των συνεργατών του περιοδικού "Ακτίνες" (1937–2007)* (Athens: Aktines, 2008).

[24] This is based in the tables in Charalampopoulos, *Ευρετήριο*, 27–386.

[25] See, for example, his "Πορίσματα από την έρευνα του Γαλαξία μας," *Ακτίνες*, no. 181 (May 1957); "Η εφετεινή προσέγγισης του πλανήτου Άρεως," *Ακτίνες*, no. 173 (July–August

his *Ραδιοαστρονομία: Εισαγωγή εις την νέαν επιστήμην* (Radio astronomy: An introduction to the new science) in 1963 are mainstream popularising introductions of the subjects for a nonspecialist audience. There is no reason to doubt what Kotsakis, and Plakidis before him, stated clearly, that their goal was not to bend science in a nebulous proselytising cause, but to communicate to their various audiences what they saw as the plain truth of the matter. However, what they considered the plain truth was heavily influenced by their ideological preoccupations.

A prime example of Kotsakis' commitment was his short foray into discussing evolutionary theories, in the early years of *Ακτίνες*. His technical expertise on the subject was nonexistent, but at the same time he was the only member of the editorial team to have any training in the natural sciences, and thus any capability to tackle such issues. In discussing evolution, Kotsakis was in fact becoming involved in a debate that had been simmering for many decades. Ever since the 1880s, conservative Christian scholars had condemned Darwinism as a Trojan horse for materialism. Darwinism had become associated with socialism and the language debates of the start of the century, to such an extent that one of the official charges against the leftist educator Alexandros Delmouzos (1880–1956) in the Atheika trial in 1914 in Nafplion was that he taught that men descended from monkeys.[26] Kotsakis contributed to a later stage of the same debates, which had erupted in the interwar years. The stakes were not only about Darwinism and communism per se, but about the nature of science in general.[27] The way he dealt

1956); "Οι σεισμοί εις την Ελλάδα," *Ακτίνες*, no. 188 (February 1958) and "Παλλόμεναι ραδιοπηγαί και ημιαστέρες," *Ακτίνες*, no. 296 (December 1968).

[26] There is a substantial literature on the history of Darwinism in Greece and Darwin's association with materialism. See, for example, Kostas Krimbas, *Ο δαρβινισμός στην Ελλάδα* (Athens: National Hellenic Research Foundation, 2017); Efthymios Nicolaidis. *Science and Eastern Orthodoxy: From the Greek Fathers to the Age of Globalization* (Baltimore: Johns Hopkins University Press, 2011), 180–92; Kyriakos Kyriakou, "Οι φυσικές επιστήμες στην εκπαίδευση: Η πρόσληψη των ιδεών του Ernst Haeckel" (PhD diss., National and Kapodistrian University of Athens, 2014); Anna Sotiriadou, "Η εμφάνιση της θεωρίας της εξέλιξης των ειδών, δεδομένα από τον ελληνικό χώρο" (PhD diss., Aristotle University of Thessaloniki, 1990). On Delmouzos, see Kostas Tampakis and Efthymios Nicolaidis, "Darwin's Dragons: 150 Years of Orthodox Apologetics and the Challenge of Darwinism," in *Global Perspectives on Science and Religion*, ed Mike Brownnutt and Keith R. Fox (Carlisle: Langham Global Library, 2024), 91–110.

[27] See Dimitrios Skordos, "Οι φυσικές επιστήμες στην Ελλάδα του μεσοπολέμου" (PhD diss., National and Kapodistrian University of Athens, 2022), 105–60; Vassilis Boyatzis, *Μετέωρος μοντερνισμός: Τεχνολογία, ιδεολογία της επιστήμης και πολιτική στην Ελλάδα του μεσοπολέμου (1922–1940)* (Athens: Eurasia, 2012); Kostis Karpozilos, "Μαρξισμός και δαρβινισμός: το μαγικό κλειδί της Εξέλιξης και το πρόβλημα της Διαφοράς στην ελληνική σοσιαλιστική σκέψη (1910–1920)," in *Φυλετικές θεωρίες στην Ελλάδα: Προσλήψεις και χρήσεις*

with evolution is indicative of his general modus operandi. His first article appeared in 1939 and was titled "The evolution of the theory of evolution". The article's goal was to "clearly and definitely" show that no theory can fully explain evolutionary phenomena.[28] Kotsakis then proceeded to selectively cite quotations and examples to prove his argument. He started by discussing the objections of Karl Beurlen (1901–1985), at the time a prominent Nazi symphathiser, and then moved on to the "distinguished professors" Freiherr Friedrich von Huene (1875–1969) and Edgar Dacqué (1878–1945). Despite Kotsakis' praise of them as field-leading experts, all these scholars were rather peripheral at the time, and rather infamous for their creationist and idealist commitments.[29] Kotsakis also leveraged the expertise of Nobel laureate Hans Spemann (1869–1941) to prove that mechanistic explanations are not sufficient, but failed to mention that Spemann was a known vitalist and, moreover, a prominent Nazi sympathiser.[30] Kotsakis' method of selective citation is, however, most prominent when he argued that biologist Edward Poulton, the president of the British Association for the Advancement of Science, believed that "we are asking to combine all … evidence to provide a fuller explanation of the phenomenon of evolution", suggesting that Poulton had doubts about the status of Darwinian evolution. However, Poulton was a dedicated Darwinian and one of the stronger proponents of the newer heredity theories of the era.[31] Thus, Kotsakis worked hard to create a narrative that distorted the state of the field in 1939.

The reason for Kotsakis' insistence becomes clearer in a series of articles in 1943 and 1944 on the history of the positive sciences in Greece in the previous 50 years, which Kostakis wrote under the pseudonym Sergios Makraios. Kotsakis argued that Greek scientists used Darwinism "to propagandise materialist and mechanistic views, which temporarily seemed to be something new and scientifically correct. All the second and third-rate scientists and popular writers of Europe were their heroes."[32]

στις επιστήμες,την πολιτική, τη λογοτεχνία και την ιστορία της τέχνης κατά τον 19ο και 20ό αιώνα, ed. Efi Avdela et al. (Heraklion: Crete University Press, 2017), 273–92.

[28] D.K., "Η εξέλιξις της θεωρίας της εξελίξεως," *Ακτίνες*, no. 7 (January–February 1939), 12–15.

[29] See, for example, Olivier Rieppe, "Karl Beurlen (1901–1985), Nature Mysticism, and Aryan Paleontology," *Journal of the History of Biology* 45, no. 2 (2012): 253–99. It must be mentioned that the intellectual climate in Greece in 1939, especially under the Metaxas regime, was not at all hostile to Nazism.

[30] Christina Brandt, "Development and Heredity in the Interwar Period: Hans Spemann and Fritz Baltzer on Organizers and Merogones," *Journal of the History of Biology* 55, no. 2 (2022): 253–83.

[31] Edward Poulton "The History of Evolutionary Thought: As Recorded in Meetings of the British Association," *Science* 86, no. 2227 (1937): 203–14.

[32] Sergios Makraios, "Αι θετικαί επιστήμαι εις την Ελλάδα και η ασκηθείσα προπαγάνδα," *Ακτίνες*, no. 36 (Easter 1943): 85.

He then recounts the earlier debates between one of the first scientific journals in Greece, *Προμηθέας*, and the founders of the para-ecclesiastical organisation Renewal (Ανάπλασις) in the 1880s and singles out for attack several professors, such as Rigas Nicolaidis (1865–1928) and Spyridon Miliarakis (1852–1919), for promoting materialism. He also condemns some of his contemporaries, such as the chemistry professor Constantine Zenghelis (1870–1957) and the civil engineering professor Angelos Ginnis (1859–1928), for materialistic ideas. Specifically Ginnis is taken to task for arguing for an education based on the natural sciences, and for considering religion too conservative for such a role. Kotsakis, however, praises others, like the powerful director of the observatory Dimitrios Eginitis (1862–1934) and the physicist Konstantinos Maltezos (1869–1951), for going beyond materialism. In the end, Kotsakis' argument is clear: Darwinism is a highly dubious theory that is increasingly being refuted, but which is being described as true by ruthless propagandists of materialism. These were exactly the arguments that Greek religious scholars were using in the 1890s and 1900s. Even after receiving an irritated letter from anthropology professor Ioannis Koumaris (1879–1970), Kotsakis only pushed back further. In his response, he lectured Koumaris on his own field of expertise, once more unironically stating that evolution is only a failing hypothesis and that true scientists should only present facts, not their belief.[33] And to make his point even further, Kotsakis once more revisited the issue in 1944, to praise other Greek scientists who "limit themselves to the true scientific aspect" of their field, most of whom, like Thrasyvoulos Vlisidis (1886–1964) and Dimitrios Chondros (1882–1962), were known to be antimaterialists or famously anticommunist. Kotsakis ended his final article in the series by saying "we only ask honesty, directness, objectivity and preciseness in every scientific matter, especially when dealing with issues that science has not yet produced positive and uncontroversial conclusions".[34] This assertion about the validity of Darwinian evolution, we should note, was made five years after the first work of the modern neo-Darwinian synthesis had been proposed. Thus, Kotsakis stuck to his arguments and tacitly made clear his goals: to continue and enrich the polemic against materialism and leftist intellectuals which Orthodox scholars had begun 50 years earlier, and were still engaging with.

The Problem of Life on Other Planets

It would be tempting, and initially plausible, to see Kotsakis' work in *Ακτίνες* as a specific yet isolated aspect of his career. After all, he did write under a pseudonym,

[33] Sergios Makraios, "Επιστήμη και προπαγάνδα," *Ακτίνες*, no. 38 (August–September 1943): 245–50.

[34] Sergios Makraios, "Θετικαί επιστήμαι και προπαγάνδα," *Ακτίνες*, no. 41 (April 1944): 71.

and this could be perhaps seen as a way to distance his "official" persona from the most polemic of his work. If we were to shift the focus, however, to other types of Kotsakis' writing, the internal coherence of his work becomes apparent. Very few of his non-*Ακτίνες* writings fail to include references to religion and antiimaterialism. Conversely, very few of his *Ακτίνες* articles stray from his scientific pursuits. A case in point is Kotsakis' decades-long writings on the possibility of life on other planets, which was his pivotal theme in the 1950s, 1960s and 1970s, in a period where he could not easily defend antievolutionary ideas. It is also a case study on how Kotsakis mobilised expertise in an area in which he had very strong academic credentials, and an increasingly dominant role.

The first such article appeared in one of the early issues of *Ακτίνες* in 1939, titled "Are the stars inhabited?". Once more, Kotsakis sets out a blueprint that he would revisit and refine over the next decades. The article is fframed around the question 'is our Earth the only of all heavenly worlds … to have the extraordinary privilege of being inhabited by living beings, of whose the human was set in charge?"[35] Despite the initial biblical framing, Kotsakis then used his significant astronomical expertise to study the Moon, Jupiter and Venus, Mars and then other planets, concluding that "there is only one planet … that we can say that 'God did not make chaos out of it, but was created to be habitable' and that is Earth."[36] The significance of this fact for Kotsakis' ideological battle is laid bare in the conclusion of the article:

> For materialists, things are going very poorly. The materialist is faced with the following dilemma …
>
> 1. Either matter does not follow the same laws everywhere …
> 2. Either life has something unexplainable by matter and the laws that govern it …
>
> The first is an absurdity … [which goes against the universality of laws that materialists believe in]. The second does not go against science. But do the materialists believe it? Then they are not materialists … For the nonmaterialist, of course, things are different.[37]

Thus, the nonexistence of life beyond Earth is framed as a devastating argument against materialism. In 1952, again in *Ακτίνες*, Kotsakis wrote an enthusiastic review of the 1951 book *Kosmos und Gott* by the German astronomer Heinrich Vogt (1890–1968). This book became a standard reference for Kotsakis, who praised Vogt as a "distinguished scientist" whom he had the honour of meeting

[35] D.K., "Κατοικούνται οι αστέρες;" *Ακτίνες*, no. 8 (March–April 1939): 75–80.

[36] Ibid., 79

[37] Ibid., 80.

in Heidelberg and as an "excellent representative of the positive sciences".[38] Despite offering a concise presentation of Vogt's career, and while accurately portraying Vogt as a very important astronomer of the era, Kotsakis fails to mention that Vogt was an ardent Nazi, who rose to the rank of Obersturmführer in the Sturmabteilung (SA) paramilitary branch of the Nazi party. At the height of his career as director of the Heidelberg State Observatory, Vogt was also considered by the Nazi party to be best German scientist to represent Nazi national interests abroad.[39] Nevertheless, Kotsakis expresses wonder and admiration for Vogt's correlation of the physical worldview with the faith-based worldview of a God-creator, and of his statement that "Physics and true Religion do not in any case contradict, but rather complement each other".[40] For Vogt, the rationality displayed in astronomy is proof of a higher intelligence at work, and Kotsakis wholeheartedly agrees.

Kotsakis picked up the argument again in a 1954 book, titled *Υπάρχει ζωή εις τους άλλους κόσμους;* (Is there life on other planets?), which is an expanded and updated version of his 1939 article. It follows the same structure, has the same goals and makes the same arguments. In the words of Kotsakis himself:

> The book presents, as far as possible, in a simple and concise way, the recent findings of scientific research, while giving the reader the opportunity to admire the majesty of creation, and thus to repeat, not only as the simple observer but as a modern astronomer, with the Psalmist "the heavens declare the glory of God; the skies proclaim the work of his hands".[41]

The book then examines the Moon, Mercury, Venus and the other planets to show how they cannot support life. It references Vogt in arguing that "the regularities that are observed in the construction of the solar system … *rule out the possibility* of having encountered each other through chance".[42] The

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[38] D.K., "Κόσμος και Δημιουργία," *Ακτίνες*, no. 127 (May 1952): 206–8.

[39] Hilmar W. Duerbeck, "German Astronomy in the Third Reich," in *Organizations and Strategies in Astronomy*, vol. 7, ed. André Heck (Dordrecht: Springer Dordrecht, 2006): 386 and 394; Mark Walker, "Physics and Propaganda: Werner Heisenberg's Foreign Lectures under National Socialism," *Historical Studies in the Physical and Biological Sciences* 22, no. 2 (1992): 363. It bears repeating that many German scientists were quickly and tacitly rehabilitated after the Second World War, with minimal repercussions. Vogt was one of them, though his tenure as the director of the Heidelberg State Observatory was not renewed after 1946.

[40] D.K., "Κόσμος και Δημιουργία," 208.

[41] Dimitrios Kotsakis, *Υπάρχει ζωή εις τους άλλους κόσμους; Μία έρευνα μεταξύ πλανητών, απλανών και γαλαξιών* (Athens: s.n., 1954), 4.

[42] Ibid., 55. Emphasis in the original.

conclusion also follows verbatim the one in the 1939 article, on the inability of a materialist worldview to account for these findings. Thus, the 1954 book shows, in the strongest possible terms, the connection between the various aspects of Kotsakis' work: His *Ακτίνες* articles acted as the springboard for the books he would later write as one of the most prominent astronomers in Greece. Kotsakis makes no secret of this fact: The bibliography of the book includes his 1939 article and other *Ακτίνες* articles, books by the theologian and founding CEE member Panagiotis Trempelas and the same books that his 1939 article cites.

The book was a success, prompting a second revised and updated edition in 1963, which included data from radioastronomy.[43] However, it was only one of many that Kotsakis published on the topic of astronomy, some of which had a more general scope. But even in those, Kotsakis included references, often extensive, to his ideological and religious commitments. For example, in 1959, Kotsakis published *Η προέλευσις του ηλιακού συστήματος* (The origin of the solar system). True to the book's title, Kotsakis discusses theories of solar system formation, from Kant to Kuiper. However, in the final "Conclusions" chapter, Kotsakis ends the book by saying that the worldview of the researcher plays a major role in how he answers fundamental problems, that the problem of the "creation" of the universe is especially difficult, and that scientists confront it with awe. Unsurprisingly, this awe is shown by quotations speaking of God, from the British astronomer W.M. Smart (1880–1975), the German astrophysicist Karl-Otto Kiepenheuer (1910–1975) and none other than Kepler.[44]

Similar arguments about the order of the universe as proof of the existence of the divine can be found in Kotsakis' subsequent books. However, there is also a subtle shift in his argumentation. In the 1970s, with radioastronomy in full swing, space travel a reality and the Big Bang theory all but verified, it became harder for a devoted scientist – even one as fierce in his commitments as Kotsakis – to continue using apologetic arguments from the 1930s. At the same time, in the age of molecular biology, Darwinism could not be presented as tentative theory. Kotsakis instead took aim at the argument about the probabilistic origin of life and the universe. In his 1973 book titled *Το αστρονομικόν σύμπαν: Δημιουργία ή τύχη;* (The astronomical universe: Creation or chance?), he furiously denounces probabilistic explanations of life, especially those of the French biochemist and Nobel laureate Jacques Monod (1910–1976). While still denouncing Haeckel and Buchner, the old nemeses of Greek antimaterialists since the 1890s, as "absolute

[43] Dimitrios Kotsakis, *Υπάρχει ζωή εις τους άλλους αστέρες κόσμους; Μία έρευνα μεταξύ πλανητών, απλανών και γαλαξιών* (Athens: s.n., 1963).

[44] Dimitrios Kotsakis, *Η προέλευσις του ηλιακού συστήματος (αι σύγχρονοι θεωρείαι)* (Athens: s.n., 1959), 99–101. The book went through three editions, the last one in 1971.

zeros", Kotsakis also considers Monod as someone who mixes his ideology with his science. His verdict on the work of a Nobel laureate in a discipline of which Kotsakis knew very little about was nonetheless damning:

> [Monod] makes many generalisations and extensions, and introduces the concept of metaphysical randomness.
>
> We will not go into a discussion of Monod's theory, which has suffered multiple and intense criticism, to prove that instead of science he offers faith, when he speaks of chance as the creative cause of life on Earth. Chance cannot be the cause of the creation of the organic and inorganic world. He offers chance and metaphysics, while combating both.
>
> Despite the noise around the work of Monod, his views do not withstand even the rudimentary mathematical scrutiny.[45]

Instead, Kotsakis declares that, on the debate between chance or creation, one should heed Vogt and lean towards creation. It is only people who have not conducted true research, and do not have objective and free judgement, that would fail to see the universe as the majestic temple it is.[46]

But this is now the endpoint of his argumentation. In the 1970s, Kotsakis slowly reversed his position on life on other planets, and the antimaterialist argument that entails. In his 1975 book *Η δημιουργία των γαλαξιών και των πλανητών* (The creation of the galaxies and planets), he is much more ambivalent, quoting the American astronomer George Abell in saying that "life can be plentiful in the Universe or be unique to Earth; and on this subject we cannot but make purely theoretical conjectures".[47] Finally, in a 1978 book devoted specifically to this question, Kotsakis fully changes his position, while still trying to marshal an argument for divine providence:

> It seems possible that we are not alone in Space. It is perhaps even impossible to consider that we are alone. And there must be other civilisation in other planets evolving and being formulated by other intelligent beings … As scientific research progresses, one can glimpse the existence of a plan and an evolutionary forwards movement. A continuous synthesis and structure from the dead world of elementary particles and from the cellular animal forms, to the composite multicellular organisms, to get to the human, with his spirit, speech and consciousness. A truly upwards drive![48]

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[45] Dimitrios Kotsakis, *Το αστρονομικόν σύμπαν (Δημιουργία ή τύχη;)* (Athens: s.n., 1973), 47.
[46] Ibid., 69, 77.
[47] Dimitrios Kotsakis, *Η δημιουργία των γαλαξιών και των πλανητών* (Athens: s.n., 1975), 28.
[48] Dimitrios Kotsakis, *Είμαστε μόνοι στο διάστημα* (Athens: Zoe Publications, 1978), 151.

This is a striking reversal for the scholar who berated an anthropology professor three decades earlier for believing that evolution can create new species. It also shows that Kotsakis saw himself, first and foremost, as a man of science. However, the whole narrative arc that Kotsakis constructed over these four decades shows, once more, how his work extended seamlessly from *Ακτίνες* to science communication publications, and back.

Physical Laws, Mathematics and the Spectre of Greek Materialism

As his participation in the Greek Light organisation shows, Kotsakis seems to have been fully aware of the type of intellectual "total war" he needed to wage against communism. His ideological opponents were Greek leftist scholars, and the arguments they had been pursuing during the period of Kotsakis' intellectual formation, in the 1930s and 1940s. It is to these framings of communism as a scientific theory, and of materialism as the only viable philosophy, that Kotsakis would respond for most of his career. This is especially apparent in the series of articles written over more than four decades on the characteristics of physical laws and mathematics. In this third and final part of Kotsakis' written corpus, I will show how this aspect of his work ties his whole ideological and intellectual project together.

Once again, Kotsakis' preoccupation with the philosophical foundations of science and mathematics started early on, in a 1939 article titled "Perceptible and imperceptible world". In it, Kotsakis argues that modern science falsified the positivism of the nineteenth century, by showing that the sensible world is only a small part of the totality of the world. As proof, he mentions sounds that cannot be heard and radiation that cannot be seen, like X-rays.[49] This rather simplistic attack on a simplistic view of positivism is followed by a different line of attack a year later, with an article on mathematics. In a heavily referenced article, Kotsakis discusses axiomatics, metamathematics and complex algebra. The reason for this exploration becomes apparent only at the end.

> Thus, the scientist and especially the mathematician, who devotes his powers to the most precise and logical of science, must be an idealist when he seeks the truth, and strives to study objects that are immaterial and not existing in the everyday life of men …
>
> These findings show that the sciences are mostly philosophical and metaphysical, rather than products of experience and observation.[50]

[49] D.K., "Αισθητός και υπεραισθητός κόσμος," *Ακτίνες*, no. 14 (March–April 1939): 57–60.
[50] D.K., "Μαθηματικά και μεταμαθηματικά," *Ακτίνες*, no. 15 (May–June 1940): 109.

Thus, Kotsakis slowly mounted an attack on what he saw as the foundations of modern materialism, specifically empiricism and philosophical materialism. He merged these two lines of attack in 1943, in an article titled "Insight into the mathematical sciences". His goal here is to show that neither strict rationalism nor experience are sufficient for true knowledge. Kotsakis used intuitionism, the philosophical theory in which certain mathematical proofs are intuitively considered true, to achieve this goal. To frame his argument and to extend these claims to the natural world, Kotsakis marshals an impressive array of references, from Whitehead to Plotinus and from Descartes to Bohr.[51] Quoting the great American mathematician George D. Birkhoff (1884–1944), Kotsakis describes that Faraday, Dirac, Einstein and Leverrier succeeded in their research through acts of faiths and similar acts of conjecture and intuition.[52] After a discussion of semi-intuitionists and intuitionists – Henri Poincaré (1854–1912), Hermann Weyl (1885–1955) and L.E.J. Brouwer (1881–1966) – among them, Kotsakis makes his ideological goal apparent, once more, in the general conclusions of his article:

> Intuition does not only contribute greatly to the advancement of science, but also completely disarms the rationalists which [in their single-mindedness] have ruled out from the human soul and in general from intellectual life any attribute and ability except rationality.
>
> The human being can, by combining strict logic and intellect in general with emotional life, intuition and faith in the existence of realities above the perceptive and the natural, live as a complete intellectual personality.
>
> Because the scientist who works within the context of the true religion does something similar when he accepts the existence of a supernatural world, and communicates with it through intuition, faith and logic, using syllogisms that are logically possible.[53]

Here we see Kotsakis' argument fully displayed: From intuitionism and the need for mathematical conjectures, he moved to faith and intuitive knowledge in general and, from there, to spiritual belief. The fact that he specifically targets rationalists, who are the philosophical enemies of empiricism, also shows the true ideological underpinnings of his project. Rationalists had in the past also been used by leftist intellectuals, and thus Kotsakis aims to show the limits of both approaches. This was in concordance with how the whole *Ακτίνες* team

[51] D.K., "Η διαίσθησις εις τας μαθηματικάς επιστήμας," *Ακτίνες*, no. 37 (June 1943): 191–95.

[52] Ibid., 193.

[53] Ibid., 195.

realigned its rhetoric after the Second World War, to blame the denial of God and the acceptance of a hollow and negative materialism and rationalism for what they saw as the decay of European civilisation.[54]

In the same *Ακτίνες* issue, Kotsakis added a third dimension to his materialist critique, by considering the nature of the physical law itself. Mechanistic and positivist explanations were part and parcel of late nineteenth-century materialism, and Kotsakis was determined to attack any such lingering ideas. In his article "The concept of the physical law", he again marshals some of his favourite intellectuals, such as the mathematicians Émile Picard (1856–1941), Poincaré and the physicist James Jeans (1877–1946), to argue that physical laws are just mathematical representations of refined experience, and not some kind of hidden natural mechanism. In truth, Kotsakis argues, they are statistical approximations with a limited area of application, which are represented as absolute for pedagogical reasons.[55] His critique is very close to the conventionalist philosophy of science of Poincaré and others, who argued that all physical laws are just conventions. However, once more Kotsakis is less interested in philosophical debates and more in combating every one of materialism's tenets. This is shown more clearly in a far more combative article which appeared just a month later, titled "New directions in scientific thought". In it, Kotsakis clearly states that "the positive sciences now have a serious formative effect in the intellectual life of the western world … the greatest influence is exerted by those new theories regarding the composition of matter. And the greatest damage was done by misrepresenting and abusing these theories."[56] After discussing the opinions of various psychologists, astronomers and philosophers, his conclusions are pretty clear:

> Positive science, working together with experimental science, is now directed towards new horizons. It is directed towards more spiritual horizons … Older [thinkers], educated with the materialist and blindly mechanistic viewpoints of the previous century, are forced to be left behind. The younger ones, however, can easily understand the newer directions, the new horizons in which deep scientific thought … and fervent and pure faith in God cooperate in harmony. The pseudo-religions have fallen one after another, and the world is turning to the eternal fountain of truth.[57]

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[54] See, for example, the article by Alexandros Tsirintanis and Melitis, "Ενας αρνητικός πολιτισμός," *Ακτίνες*, no. 49 (May 1945): 66–69.

[55] D.K., "Η έννοια του φυσικού νόμου," *Ακτίνες*, no. 49 (May 1945): 70–76.

[56] Sergios Makraios, "Νέοι προσανατολισμοί εις την επιστημονικήν σκέψην," *Ακτίνες*, no. 50 (June–July 1945): 120.

[57] Ibid., 122.

The point is now clear: Modern science is veering towards spirituality, and only the materialist fossils of old cannot not see it.

Finally, Kotsakis brought the various strands of his thought together in an article published a year later, in 1946. After having tackled intuition, physical laws and rationalism, he goes on to compose a new argument against materialist determinism, thus allowing for free will and, by extension, Christian morality.

> The problem of free will has been intertwined, since the dawn of scientific thought, with man's ideas and views about the world … Materialist philosophers claimed … that there is no serious difference in nature between the material and the spiritual or intellectual world. They accepted that the natural world is the only reality that man can know; a reality that is defined by strict laws that control everything with great precision.[58]

This concise statement brings together Kotsakis' various previous articles. To dismantle such a philosophical worldview, he first had to show that there are realities where physical laws do not apply – hence his discussion of intuition – then to discuss what a physical law is, and then to prove that precision and mechanistic explanation no longer really hold. Only then could free will, and thus Christian morality, be possible. In this final article, Kotsakis goes into the heart of modern physics, citing prominent physicists such as Arthur Compton, Max Planck, Jeans, Werner Heisenberg and others, to argue that uncertainty is the characteristic of new physics. Moreover, physical laws have been shown to be empirical rules and nothing more, and the advent of quantum theories has shown that causality cannot work the way materialists require it to work. For Kotsakis, the conclusion is clear:

> Since we recognise that the purely mechanistic-causal methods cannot explain and define many of the phenomena of inert nature, no one can today dismiss events and realities which take place in the spiritual world in the name of positive science, with the excuse that they do not obey the rule of causality. Mechanistic philosophers and positivists claimed that … man is not responsible for his actions "because he blindly obeys causality" and that miracles are not possible in nature "because its laws are unbreakable and rigid".
>
> These arbitrary opinions, however, lack any scientific merit … [Great scientists] see free will as belonging to a wider context, in which human freedom is combined fully with the plan of a Supreme Intelligence or ideal Spirit, to quote Planck.

[58] D.K., "Η νέα φυσική και η ελευθερία της βούλησεως," *Ακτίνες*, no. 57 (May 1946): 167.

> Thus, a new horizon appears for the beneficial influence that man can bring about, when he acts as a spiritual personality.[59]

It is worth noting that Kotsakis once more uses the term "spiritual personality" that he used in his 1943 article, thus showing the internal thread that binds all these articles together. Spiritual realities are possible, ironclad physical laws do not exist and causality has perished. Miracles are real and possible, in every sense of the word.

The period from 1947 to 1950 was a watershed and a triumph for the CEE and for *Ακτίνες*. The success of the publication of the *Declaration* and the *Manifesto*, and the assumption by Ieronymos Kotsonis (1905–1988), a CEE founding member, of the duties of head priest to the Greek royal family, gave *Ακτίνες* and CEE significant political and social capital. The *Manifesto* was a distillation and reformulation of ideas that had appeared in *Ακτίνες* over the years and thus galvanised leftist intellectuals to rework and synthesise their arguments accordingly.[60] The most powerful such intellectual response from the left was Nikolaos Kitsikis' (1887–1978) publication of *Η φιλοσοφία της νεώτερης φυσικής* (The philosophy of modern physics) in 1947. Kitsikis was a civil engineer, one of the founders of modern statics in Greece, a professor and later rector of the Athens Polytechnic School, and a very prominent socialist intellectual who advocated a version of utopian technocratic socialism.[61] Kitsikis very specifically wrote his *Philosophy* as an answer to the *Manifesto*.[62] To accomplish that, he provided an intellectual tour de force across philosophical metaphysics from Newton and Laplace to Kant and Mach, and from relativity and quantum theory to solar energy. In fact, it is no accident that Kitsikis' book discusses the same problems, questions and even thinkers that Kotsakis had written about over the course of 15 years in *Ακτίνες*. Seen in isolation, Kotsakis' work seems at times to address an eclectic assortment of intellectual issues. When examined through

[59] Ibid., 172–73.

[60] For a more detailed history of these events, and for the importance of the *Διακήρυξη* (Declaration) and the and the *Προκύρηξη* (Manifesto), see Skordos, *Οι φυσικές επιστήμες*; Makrides, *Orthodoxy in the Service of Anticommunism* and Tampakis, *Science as an Orthodox Weapon*.

[61] On Kitsikis, see Yannis Antoniou, *Οι Έλληνες μηχανικοί: Θεσμοί και ιδέες, 1900–1940* (Athens: Vivliorama, 2006), 330–50, 377–98; Yiannis Antoniou, Michalis Assimakopoulos and Konstantinos Chatzis, "The National Identity of Inter-war Greek Engineers: Elitism, Rationalization, Technocracy, and Reactionary Modernism," *History and Technology* 23, no. 3 (2007): 241–61; Elli Papa, *Νίκος Κιτσίκης: Ο επιστήμονας, ο άνθρωπος, ο πολιτικός* (Athens: Technical Chamber of Greece, 1986).

[62] Nikos Kitsikis, *Η φιλοσοφία της νεώτερης φυσικής* (Athens: Papazisi, 1947), 6.

the lenses of Kitsikis' *Philosophy*, the same group of issues emerges as a series of hotly contested topics in the ideological battleground between materialists and antimaterialists, socialists and conservatives. With the stakes so clearly laid out in the *Manifesto*, *Declaration* and *Philosophy*, Kotsakis spent most of the 1950s revisiting the same themes and sharpening his arguments. In 1950, he tackled the question of mathematical simplicity and beauty in the study of nature, arguing that their existence in our scientific theories indicates that a pure mathematician, a Grand Architect of the Universe, exists.[63] In 1957, Kotsakis tacitly contrasted Kitsikis' claims by picking up a line of argument from his 1938 articles and once more attacking the concept of matter. In an article on atomic physics, he concludes that the old materialists were wrong to declare the atom as the building block of matter and that we do not know what matter actually is.[64] He pushed the issue even further with an article on antimatter the following year, once more making his intellectual target explicit:

> And now that the issue of the existence of antimatter has been posed, what do they have to say, all those who sloppily and with ease voiced opinions supposedly scientific? Furthermore, if we consider that some of them based whole worldviews on their dogmatic assertions, for themselves and for the whole of humanity, then the issue becomes even more serious.[65]

Finally, Kotsakis combined and unified his arguments in his book *Η αρχή της αιτιότητας και η ελευθερία της βουλήσεως* (The principle of causality and free will), which appeared in two editions, one in 1953 and a revised and expanded one in 1957. In this work, Kotsakis brought together the various topics that he had been discussing from 1938 onwards – the nature of causality, the role of aesthetics and intuition, the importance of indeterminism – to create a powerful argument against dialectical materialism and its philosophical underpinnings. This book, more than any other, demonstrates that Kotsakis saw his work over all those years as part of a single project. Its chapters are reworked and expanded articles from *Ακτίνες*, and are laid out in the same sequence. The conclusions in Part I of the book are reproduced verbatim from his 1946 articles, while the conclusions in Part II on free will and the multiple layers of reality which physical laws cannot explain are the same as in his 1939, 1943 and 1945 articles. In the

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[63] Dimitrios Kotsakis, "Αι αρχαί της απλότητος και της ωραιότητος εις την φύσιν," *Ακτίνες*, no. 104 (May 1950): 202–8.

[64] Dimitrios Kotsakis, "Το μυστικόν του ατόμου και του πυρήνος του," *Ακτίνες*, no. 177 (January 1957): 19.

[65] Dimitrios Kotsakis, "Υπάρχει αντιύλη;" *Ακτίνες*, no. 193 (June–July 1958): 300.

book's final pages, Kotsakis once more shows how this project is tied together and resonates with his earlier writings, and what the ultimate aim of his work actually is.

> From everything said so far, it is easy to see that researchers can be split not into determinists and indeterminists, but into two other categories: Those who accept metaphysical and spiritual realities and those which dismiss them. In the first category belong those who usually accept indeterminism and free will and some determinists, while in the second [belong] those who deny spiritual realities, embracing materialism and blind mechanistic philosophy … Most modern researchers belong in the first category, among them scientists as prominent as L. de Broglie, M. Planck. M. Hartmann, A. Einstein, etc., despite being determinists …
>
> We believe, however, that they are condemnable, those people who accept a priori one-dimensional beliefs, which they believe to be the only representative of reality, and who dismiss any other possible view on the foundational problems of the world without first examining it. Those, materialists but also usually determinists, think and decide not based on objective criteria, but by dogmatically following a specific worldview.[66]

Principle was, in many ways, Kotsakis' philosophical and ideological magnum opus. After two decades of agonistic discussions on various aspects of the same ideological battlefield, this book brought all his arguments together.

In the 1960s and up to 1974, the CEE continued to be influential. However, the deep internal crisis within the Zoe Brotherhood pushed both Tsirintanis and several founding members like Trempelas away from the organisation. Kotsakis remained active, both as a member of the CEE and the brotherhood but also as a writer. However, his writings increasingly became reformulations and reconsiderations of older ideas. A case in point is his 1972 book *Η συγκρότηση του Σύμπαντος* (The constitution of the universe), in which there are no grandiose pronouncements about life on Earth, the nature of matter or any other subject that was usually found in Kotsakis' earlier books. The only reference is a small paragraph about our inability to understand matter and the relation of this problem to foundational philosophical questions.[67] In 1973, Kotsakis was asked by the university senate to represent the university at the celebrations for the Greek Students' Day of Prayer, an obscure celebration instituted in the 1950s which gained new prominence under

[66] Dimitrios Kotsakis, *Η αρχή της αιτιότητας και η ελευθερία της βουλήσεως* (Athens: s.n., 1957), 83–84.

[67] Dimitrios Kotsakis, *Η συγκρότηση του Σύμπαντος* (Athens: s.n., 1972), 83.

the junta. Kotsakis chose as the topic of his speech the relations between physics, liberty and prayer, the same topics that he tackled in his 1957 book. The fact that he chose it for such a momentous occasion shows how important the topic was for Kotsakis, and how central it was in his work. In his speech, Kotsakis once more quoted almost verbatim his earlier arguments about determinists, the various layers of reality, the nature of physical laws and the problem of free will. He ended the lecture with a very rare autobiographical note:

> In April 1931 … I assumed my duties in the National Observatory of Athens, with the lamented Professor Dimitrios Eginitis as its director, and from 1935 I worked and collaborated with emeritus professor Stavros Plakidis. Their example and their views have inspired, to a great extent, my own scientific training and my spiritual view of the Universe, for which I owe them a deep debt of gratitude.
>
> During that time, we have made great discoveries in astronomy, especially after the war, and the view of the Universe today is today even more attractive, majestic and imposing. I stand at this hour as one of the small spectators of the grand spectacle of the world of Space, while I also feel as a fighter for the great spiritual work … And I believe that our role in this field is one of free and responsible humans.[68]

In his final years before retiring, Kotsakis thus tied together his life's work with that of his predecessors, especially Plakidis, who may well have been in the audience. He also specifically mentioned the "grand spiritual work of free and responsible humans", a phrase which he used many times in his *Ακτίνες* writings to denote his own intellectual milieu. In a career that spanned more than four decades, dozens of articles and books and a written corpus comprising hundreds of pages, Kotsakis was nothing if not constant in his beliefs, his intellectual and ideological commitments and in his will to pursue them.

Kotsakis' intellectual and ideological tenacity is nowhere more evident than in his post-1974 writings. In the Metapolitefsi era that followed the fall of the junta in 1974, the Greek intellectual and cultural landscape changed radically.[69] Most of the initial CEE team had either retired or passed away. Kotsakis, however, continued to fight the same fight, against opponents whose ideas had been themselves superseded. In 1977, he published *Η κοσμοθεωρία του υλισμού* (The worldview

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[68] Dimitrios Kotsakis, *Φυσικόν κοσμοείδωλον, ελευθερία και προσευχή: Ανάτυπο εκ του Περιοδικού Φιλιατρά* (Athens: s.n., 1973), 15.

[69] See, for example, Dimitris Tziovas, *Greece from Junta to Crisis: Modernization, Transition and Diversity* (London: IB Tauris, 2021); Ioannis Chalkos, "The International Dimensions of the Metapolitefsi, 1974–1976: A Reassessment," *Byzantine and Modern Greek Studies* 48, no. 2 (2024): 364–81.

of materialism), which was the distillation of all his arguments over the years, specifically aimed at dialectical materialism. Kotsakis felt now free to name the names of his intellectual opponents, and to state his views in an uncontroversial way, even more so than before. This is why this book merits detailed quotation.[70]

> [Moleschott, Buchner and Vogt] said: When we speak of positive science, when we are in the realm of physics, mathematics, engineering, etc., we are automatically working within the context and bounds of materialism and its worldview. They thus claimed that materialism and science are the same thing … What Moleschott, Buchner and Vogt claimed is so arbitrary, unsubstantiated, superficial and untenable, that one must wonder how people, and scientists nevertheless, could believe it.
>
> The decline of these materialists was recognised by other materialists, who had some self-esteem, and thus worked to disavow and marginalise them. They said that this group represents vulgar and rough materialism. Thus, Professor Kitsikis is forced to write … And yet, these vulgar materialists are not in any way more vulgar than the proponents of so-called dialectical materialism. (52–53)
>
> Materialism has collapsed as a scientific and philosophical system. (83)
>
> But in recent years there has been a revival of materialism in general … Materialist worldview. Dialectical materialism. Historical materialism. Darwinism. Mechanistic philosophy and technocracy. Denial of any spiritual value. (87)
>
> In Russia, where the communist party rules, no teaching of any other philosophy is allowed, except dialectical materialism … And it is steadily in line with the nineteenth century, because the whole structure of dialectical materialism is based on the materialism of the 1850s. (94)
>
> [They want to] defend the theory, and convince others that life is created by chance, that humans come from beasts, that food and economic conditions alone direct human life and human societies … Because materialism is presented as scientific, as being based on science, and positive science at that! … But dialectical materialism believes [instead] in violence and revolution. (96)
>
> Those who believe in the worldview of materialism are retarded, regressive and anachronistic. (105)
>
> [They are against Christianity.] But they should be beware, lest their aggressive and prejudiced stance becomes the reason for science to

[70] Dimitrios Kotsakis, *Η κοσμοθεωρία του υλισμού* (Athens: Zoe Brotherhood of Theologians, 1977). Relevant pages given after the quotes.

> turn against them with its nuclear energy and destroy them. It is only the excellent combination of faith and science that can lead to new discoveries, in life and in knowledge. (106)

These extensive quotes are revealing in many ways. Kotsakis once and for all rallied against his Greek intellectual opponents. However, in 1977, with molecular biology and DNA firmly established, with the advent of genetic engineering and the discovery of Lucy (*Australopithecus afarensis)*, not to mention the Beatles, the Rolling Stones and the 1973 Prevention of Nuclear War Agreement, such a fervent denial of Buchner and Darwin, and such nuclear threats, were exceedingly out of place. Just as Kotsakis brought his whole life's work together, it had become irrelevant.

Kotsakis and Science Communication for All

Judging by the number of books he published and the circulation of *Ακτίνες*, Kotsakis was probably read by thousands of people in his 40-year long career. However, it is probably in his role as first director of the newly founded Eugenides Foundation Planetarium that he had the greatest impact on the public sphere. Even today, the Eugenides Planetarium remains a hallmark of science communication in Greece, and under the directorship of the extremely charismatic and erudite Dionysis Simopoulos (1943–2022) from 1972 to 2014, it became the most prominent institution of its kind in the Greek space. However, it is exactly the pre-eminence of Simopoulos in that role which has obscured Kotsakis' role as its first director.

Eugene Eugenides (1882–1954) was a shipping and commercial magnate who bequeathed most of his fortune for the creation of the Eugenides Foundation. The foundation was established in 1956, with the goal of promoting the modernisation and industrialisation of Greece, through scholarships, the publication of textbooks on technical education and the creation of a library, a science instrument collection, a telescope and a planetarium.[71] The foundation's first president, and by all accounts its heart and soul for the first 20 years of its operation, was Eugenides' sister, Marianthi Simou (1895–1981). Under her direction, Plakidis was appointed the astronomy advisor to the foundation, and he promptly suggested Kotsakis for the position of planetarium director. Kotsakis assumed the position in 1962 and was present when its current premises were inaugurated in 1966. From 1970 to 1972, most of the planetarium's activities were undertaken by the astronomer Konstantinos Chassapis (1914–1972), though still under Kotsakis' supervision. In the first six years of its operation,

[71] *Ίδρυμα Ευγενίδου* (Athens: s.n., n.d.), 6. This album does not specify a publication date but is sometime after 1969–1970.

the planetarium attracted an average of 35,000 people annually, during a time that the population of Athens was fewer than 1.5 million.[72]

The planetarium's activities were originally based on the university lecture paradigm. Chassapis and Kotsakis had written the school textbook for astronomy used at the time, so a significant portion of the planetarium's activities were integrated into the school curriculum. Schools constituted its largest audience. Other target groups included military cadets, naval academy and university students, but also members of the general public, for whom there was a very popular series of weekly lectures. The album for the presentation of the planetarium, obviously written by Kotsakis, discussed its activities as well as some of the topics covered in its lectures. These included the constellations, the solar system, stars and mythology, space exploration, the question of life in other planets and the Star of Bethlehem.[73] It is the last two that are especially relevant for the purpose of our discussion.

As we have already seen, the structure of the solar system, the planets and the question of life beyond Earth had been staples of Kotsakis' thought for decades before he took the helm at the planetarium. There were also topics and themes that the most prominent astronomer of his era would have been expected to discuss and communicate to a wider audience. In the same vein, during the Cold War space race between the USSR and USA, it was to be expected that a planetarium would have devoted its attention to questions of space travel, as Kotsakis himself did in *Ακτίνες*.[74] Nevertheless, we have also seen that Kotsakis consistently used these same topics to present his own views on the relation of science to Christianity, and to combat the spectre of materialism. It is thus worth considering that something similar would also take place in the planetarium's lectures. The most indicative case is the last topic, the Star of Bethlehem.

The first discussion of the Christmas Star from an astronomical perspective can be traced back to Plakidis, and a lecture he gave to the Academic Social Union, a religious group, in 1938. Plakidis reviewed all the theories about the astronomical phenomenon that was said to guide the Magi to the birthplace of Jesus, from Origen up to Kepler and Tycho Brahe. He considered planetary conjunctions, new stars – which would later be identified as novae – and meteorites. While he was very careful to show how none of the explanations are sufficient, Plakidis' conclusion left no doubt as to the historicity of the astronomical phenomenon:

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[72] The data has been inferred from the planetarium logbook for that period.

[73] *Ευγενίδειον Πλανητάριον* (Athens: Eugenides Foundation, 1965), 16.

[74] Kotsakis discussed space travel in *Ακτίνες* also, in a series of articles in 1959, 1960, 1963 and, of course, 1969.

> In conclusion, we can say that no physical explanation can fully verify the glorious story of Matthew the Evangelist … there can be no doubt that an extraordinary astronomical phenomenon did happen during the Birth, and in the Crucifixion, of Jesus Christ … It is a historical reality which no one can deny without proving its nonexistence with nonrefutable arguments.[75]

Plakidis continued to defend this view until at least 1952, as his book on the subject demonstrates.[76] This strange and awkward argument, which placed the burden of proof on the denier, rather than the astronomer, would be repeated verbatim by Kotsakis several decades later. In 1980, Kotsakis published a book with the exact same title, years after he left the planetarium.[77] However, as we have seen, Kotsakis was nothing if not persistent in his treatment of such issues, so it is highly probable that the lectures he or Plakidis delivered in the planetarium were based on this template. Kotsakis began his discussion with a full theological examination of the Saviour that humanity had been expecting, before going through the whole range of possible explanations, from supernovae to meteors and from planetary conjunctions to atmospheric phenomena. The book's conclusion is one of the most revealing examples of the essential tension between Kotsakis' scientific integrity and his commitment to his ideological beliefs and Christian faith.

> It is certain that an extraordinary, at least for the Magi, star appeared, which led them to newly born King.
>
> The book's author is obliged to present with total objectivity all the astronomical and historical facts, the status of the field and the views of those who have studied the scientific data and have followed the methods of science to do so. To the point that one can use astronomical data, the author would perhaps suggest that he considers the supernova as the most plausible and logical explanation. But he still considers the matter open.[78]

The book ends by restating Plakidis' view in an extended reference. Thus, Kotsakis followed Plakidis' lead and presented a very thorough account of the problem, while remaining steadfast that a physical explanation is not only possible but in fact undoubtedly true, even if not known yet. A similar view, but with a very

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[75] Stavros Plakidis, *Το Άστρον της Βηθλεέμ* (Athens: Library of the Academic Social Union, 1939), 24.

[76] Stavros Plakidis, *Το Άστρον της Βηθλεέμ* (Athens: Christian Student Union, 1952).

[77] Dimitris Kotsakis, *Το Άστρον της Βηθλεέμ και η επιστήμη* (Athens: Zoe Brotherhood of Theologians, 1980).

[78] Ibid., 69–72. Emphasis in the original.

different explanation, is given by Chassapis, who was a much more sympathetic to astrology and Orphism. In a transcript of his lecture given in the planetarium in 1971 and 1972, Chassapis considers the matter fully explained, by positing that a triple planetary conjunction in 6 to 7 BC was the astrological sign that the Magi needed.[79] Despite the fact that both Plakidis and Kotsakis categorically deny this explanation, Chassapis very confidently presented it in his very popular lectures in the planetarium. Despite the differences of opinion, all three astronomers agreed, and lectured on the fact, that there was real astronomical phenomenon that explained the Star of Bethlehem.

Conclusion: Science, Faith and the Long, Decentred Cold War

The Star of Bethlehem went through many iterations. The author of this article saw it on a school trip in the 1990s, and a newer version is still being shown in the Eugenides Planetarium today, under the name "The Star of Christmas". In 2006, Dionysis Simopoulos edited a show guide for the version then presented, collecting articles from astronomers and theologians.[80] In all of them, the Star of Bethlehem is described as a transcendental phenomenon, not a natural one. Gone are the days when planetarium lectures – and the astronomers who made them possible – categorically assured viewers that the star was something one could have seen in the sky.

This gradual fading from the public eye of Dimitris Kotsakis' work in the planetarium in a way symbolises the whole trajectory of his work. Kotsakis – the astronomer, the founder of observatories, the professor, the director of the planetarium, the founder of the CEE and Greek Light, a member of the Zoe Brotherhood – was very much both a product and a formative agent of the era that spans most of the twentieth century, but whose centre of gravity extends from the interwar period to the first decade of the Metapolitefsi. His life and intellectual trajectory very much epitomise the tensions, confluences and intellectual battlegrounds of twentieth-century Greece. Kotsakis was formed in the Orthodox, conservative, antimaterialist traditions of nineteenth-century Greece. However, with his work in the Zoe Brotherhood and the CEE, he also helped formulate and defend the most influential and impactful Orthodox sociopolitical and scientific critique of the twentieth century. At the same time, Kotsakis was also a central figure in twentieth-century Greek astronomy as well

[79] The transcript *Ο Αστήρ της Βηθλεέμ* was discovered in Chassapis' file in the Eugenides Archive.

[80] Dionysis Simopoulos, ed., *Το άστρο των Χριστουγέννων: Οδηγός παράστασης* (Athens: Eugenides Foundation New Digital Planetarium, 2006).

as the heir to an academic tradition of erudite public engagement going back to Dimitrios Eginitis via Plakidis. He is thus very much a Greek intellectual, someone who very poignantly never studied abroad.

However, when examined through the lens of standard mid-twentieth century historiography of science, Kotsakis is also very much a Cold War scientist. He worked in astronomy, one of the most contested natural sciences of the Cold War era. He was a polyglot, who travelled abroad and took part in international events, represented Greece and Greek astronomy and negotiated the acquisition of complex astronomical instruments from the West. Finally, he fiercely battled communism and materialism, not only scientifically, but also politically and culturally. Kotsakis would feel right at home in the company of some of the fiercest anticommunist scientists of the era, such as John von Neumann and Edward Teller.

Dimitrios Kotsakis' life and work signify the importance of a holistic reintegration of the history of Greek science into the broader narrative of twentieth-century Greek history. As this analysis has shown, Kotsakis' work transcended standard historical categories, audiences and modes of expression. His arguments moved seamlessly from the religious pages of *Ακτίνες* to university textbooks, and from science communication books to planetarium lectures. This fluidity was not accidental; it was a deliberate strategy and perceived as an intellectual duty. Kotsakis' scientific credentials did not merely exist alongside his religious convictions, nor were his ideological beliefs disparate from his academic role. Each fortified the other, creating a unified intellectual persona that redefined "true" astronomy as inherently antimaterialist. By treating these disparate outputs as a single corpus, we can see how Kotsakis mobilised scientific expertise for the most widespread anticommunist campaign of mid-twentieth century Greece. However, this was not simply a local reflection of the global US–USSR conflict. Crucially, Kotsakis and his peers did not wait for the Cold War to begin their crusade, nor did they cease when it thawed. They utilised deep-seated local "resources", specifically Orthodox apologetics and prewar antimaterialist rhetoric, to wage a struggle that long predated the geopolitical Cold War.

Ultimately, Kotsakis is an important historiographical signifier of the need to reexamine the perceived boundaries between scientific work, political history and ideological aspirations.

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