

# Astronomy and political theory

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**Abstract.** This paper will argue that astronomical models have long been applied to political theory, from the use of the Sun as a symbol of the emperor in Rome to the application of Copernican theory to the needs of absolute monarchy. We will begin with consideration of astral divination (the use of astronomy to ascertain divine intentions) in the ancient Near East. Particular attention will be paid to the use of Newton's discovery that the universe operates according to a single set of laws in order to support concepts of political quality and eighteenth century Natural Rights theory. We will conclude with consideration of arguments that the discovery of the expanding, multi-galaxy universe, stimulated political uncertainty in the 1930s, and that photographs of the Earth from Apollo spacecraft encouraged concepts of the 'global village'.

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The French philosopher Bruno Latour argued that *"No one has ever heard of a collective that did not mobilize heaven and Earth in its composition, along with bodies and souls, property and law, gods and ancestors, powers and beliefs, beast and fictional beings. Such is the ancient anthropological matrix, the one we have never abandoned"* (Latour 2006, p. 107). Latour's thesis is that theories of political and social organisation are connected with astronomical and cosmological models and, even though the details may change, such connections can be traced in all societies at every level of historical development. In this paper, then, I will briefly examine some of the ancient applications of astronomy to politics, then consider examples from the sixteenth and seventeenth centuries, and conclude with the suggestion that political theory still exploits cosmological and astronomical theories.

The notion that the prehistoric origins of human political and social organisation was linked to the sky was epitomised by the archaeologist Jacquetta Hawkes. Hawkes, famous in the 1960s for her scepticism concerning Stonehenge's possible rôle as an observatory, allowed herself a brief moment of poetic speculation on just when our hominid ancestors began to look at the Sun. It must have been back in East Africa, she reasoned, when the fossil record shows that the earliest humans were walking on two legs and making tools around three million years ago, that they began to notice the Sun a separate powerful force in their lives. *"Now at last mind was dawning"*, she wrote, *"raised between Sun and Earth...In that dawn of mind, sunrise and sunset, if not the Sun itself, seem likely to have been among the first things to have been named by the first men. Even such a being as Oldoway Man [Olduvai man, from the Olduvai Gorge in Kenya], one of the earliest known hominids ... must always have been very much aware of the passage of the Sun across the gorge where he lived. He may conceivably even have used the lips stretched over his ape-like snout to frame sound to express its coming and going. if so, then here*

already was a step in creation through *logos* – the separation of day and night” (Hawkes 1962, pp. 47-8).

The development of political astronomy in ancient societies is the consequence of what we might call an ‘environmental theology’. Such a theology was particularly notable in Mesopotamian society from the late third millennium BCE. From the title of Thorkild Jacobsen’s description of the Mesopotamian cosmos, ‘*The Cosmos as a State*’, I have derived the term ‘*Cosmic State*’ to describe societies in which the earthly system is through to be inseparable from the celestial (Jacobsen 1946, pp. 125-184). The same label could equally be applied to the Egyptian, Chinese or Mayan systems as well as many others. Indeed, the notion is as alive today as ever, propagated by religious literalists of all faiths, and encouraged by simplistic adaptations of astronomical ideas.

Our earliest surviving account of the practical use of astronomy to manage the state, occurs in the ‘dream of Gudea’, the *En* (lord) of the city state of Lagash around 2000 BCE (Frankfort 1978, pp. 240-3, 255-80). The story features the goddess *Nanshe* (also known as *Nisaba*), who may have been an antecedent of the scribe god *Nabu* (Mercury). *Nanshe* was said to measure heaven and Earth, to know the secrets of calculation and, together with *Suen*, or *Sin*, the Moon god, to ‘count the days’. *Nanshe*’s associated functions as goddess of grain and as the expert on accounting and the fair management of resources hint at both the practical uses of astronomy in agriculture and the benefits of a well-regulated calendar in maintaining social order. Her temple in the city of Eresh was called the *e-mul-mul*, the ‘House of Stars’, and she was the owner of a lapis-lazuli tablet which is known variously as the *dub mul-an* or *dub mul-an-ku*, ‘the tablet with the stars of the heavens’ or ‘the tablet with the stars of the pure heavens’. This she consulted by placing it on her knees.

The story of the dream, of which we have a very full account, reveals with dramatic force the interplay of natural, divine, earthly and heavenly forces which were believed to regulate Mesopotamian society and which provided a rationale for the development of astral divination – the use of celestial patterns to commune with gods and goddesses. The episode commences with the decision by *Enlil*, the leader of the divine assembly, to restrict the Tigris’ annual rise, on orders carried out by *Ningirsu* (later associated with the planet Saturn). The people of Lagash understood immediately that this break in the natural rhythm had alerted them to a divine warning – a threat of impending drought. But what, exactly, was required? It was incumbent on Gudea, as the intermediary between heaven and earth, to ascertain exactly what was needed. Once Gudea had announced his intention to open a dialogue by making a sacrifice, *Ningirsu* sent him a dream. Still unsure of the correct course of action, Gudea sought advice from *Nanshe* who in turn consulted her tablet of stars, and on this basis she drew the plan of a temple which Gudea was instructed to build for *Ningirsu*. There may well be further celestial imagery in the dream, for *Ningirsu* appeared as a sphinx-like figure with the lower parts of a flood wave and surrounded by lions. It is tempting to identify these as symbols of Leo and Aquarius, the constellations then occupied by the Sun at the summer and winter solstices, the longest and shortest days of the year. But most important was the belief that, by taking action and constructing the temple, *Enlil* and *Ningirsu* would be placated, and a worse disaster than the Tigris’ failure to flood would be averted. The story of Gudea’s dream offers us a template of what was to be Near-Eastern astronomy’s major function until the fifth-century BCE, to simultaneously guarantee the harmonious function and survival of the state while at the same time gaining military and political advantage over its rivals. Once fate had been identified, it could be amended and astral theology, whether practiced by the king or his subjects, was essentially participatory. It can only be understood in the context of a cosmic state in which it provided a vehicle through which both monarchs

and people could negotiate the future with their celestial rulers. They were engaged in a dialogue with destiny. Another important point needs to be stressed: although affairs of state were all mediated via the king in a system which, as far as his subjects were concerned, was fundamentally autocratic, anyone, rich or poor, high or low, male or female, might communicate directly with the celestial deities. Astral theology was at once pluralistic and a feature of the prevailing vernacular religion, the religious beliefs and practices of ordinary people, irrespective of temples, priesthoods and theological dogma.

The application of stellar and planetary patterns to the personal advantage of kings and emperors was to be a persistent feature of the Hellenistic and Classical worlds, and found notable expressions in a series of events from the selection of an auspicious celestial moment at which to found the great city of Seleucia (Cramer 1996, p. 11) in around 305 BCE, to the future emperor Augustus' application of the comet of 44 BCE to promote his own power (Ramsey & Licht 1997), the use of the Sun as a focus for imperial religion, especially in the third century (Halsberghe 1972), and the attention paid to Venus's rising as morning star by imperial usurpers at the end of the fifth century (Campion 2005). The astral theology of the Mesopotamians (and Egyptians) was systematised by the Greek philosopher Plato (c. 428-348) into a scheme in which human society and the cosmos were completely integrated. In a series of passages, chiefly in *Timaeus*, *Republic*, *Laws* and *Statesman*, '*Political Platonism*' was established a means of organising the state in line with a cosmos which was organised in a perfect system based on mathematics, geometry and the intimate integration of all parts of the universe, psychic and material, with each other.

Plato insisted on the logical conclusion of his cosmogonical myth – that individuals are composed of the same stuff as the cosmos, including in the way they moved, which then helps determine their behaviour (*Timaeus* 42 C-D). He had no doubt that the organisation of the state and politics should be deliberately arranged to conform to the same mathematical principles which regulated the motions of the stars and planets. For example, in *Laws* (VI.771A-C, see also V.737E-738A), he argued that the principle number on which political organisation should be based is 5040, the '*tribal number*'. This number was, he believed, significant for two reasons, both due to its connection to the calendrical number, twelve. First, it has the greatest number of divisors (59), including all numbers from 1 to 12 except 11. Second, of these the divisibility by 12 is crucial: "*Our whole number*", he wrote, "*has twelve subdivisions, and the tribal number also has twelve; and each such portion must be regarded as a sacred gift of God, conformed to the months and to the revolution of the universe*" (*Laws* V.771B). Further, the ideal state was to be governed by a Council of 360 members, of whom thirty should govern for a month of thirty days at a time, or one lunar cycle (*Laws* VI.756B-C, 758B *Epinomis* 978E-979A). Plato's cosmic-political doctrines were influential throughout the classical period, were widely accepted in Christian Europe thanks to the admiration which some theologians, including St Augustine, held for the philosopher's works. The keen interest in Plato's teachings in the Renaissance, from the mid-fifteenth century, confirmed notions that terrestrial politics should be applied to the goal of aligning human society with celestial laws. The implications were generally authoritarian and Karl Popper, the philosopher of science, argued that Plato's belief that only philosophers could implement celestial law order in the management of political order was the foundation of a dictatorial tendency which reached its ultimate expression in the communist states of the twentieth century (Popper 1957, 1986). Regarding the Renaissance, the political historian Ernest Barker cited an argument for the '*doctrine of divine right from Sir Robert Filmer, who remarks in his Patriarcha that 'the Divine Plato concludes a Commonwealth to be nothing else*

but a large Family', and argues that, since the father is divinely charged to rule the family, the king is therefore divinely charged to rule the commonwealth' (Barker 164, p. xxi). Barker repeated the suggestion from others that Plato assumes 'the Pythagorean view, which represented God as the shepherd of the world, and kings as the image of God. 'Such a view', Barker continued, 'postulates theocracy, or, at any rate, a theory of the divine right of kings' (Barker 164, p. 316). The Platonic cosmos was one which emphasised political obedience and respect for established order –as long as that order was attuned to celestial harmonies.

Plato's popularity in the fifteenth century was matched by that of the Corpus Hermeticum, the cosmological writings composed in Hellenistic Egypt and attributed to the legendary teacher, Hermes Trismegistus. Copernicus, who was studying in Italy while interest in Platonism was at its height, was equally fascinated by Hermeticism. That this was so is evident from the tone of the introduction to *De Revolutionibus*. Copernicus was convinced by the Hermetic notion that a 'spiritual' Sun was the heart of the cosmos, irrespective of the location of the physical Sun, and concluded that it made sense for the latter to occupy the same space as the former. In words which appear to have been applied to the propaganda of absolute monarchy, Copernicus wrote that,

*"In the midst of all assuredly dwells the Sun. For, in this most beautiful temple, who would place this luminary in any other or better position from which he can illuminate the whole at once? Indeed, some rightly call Him the Light of the World, others, the Mind or the Ruler of the Universe: Hermes Trismegistus names him the visible God. Sophocles Electra calls him the all-seeing. So indeed the Sun remains, as if in his kingly dominion, governing the family of Heavenly bodies which circles around him."*  
Copernicus (1995, p. I.10)

Hutchison (1987) pointed out that the immediate consequence of what I would call 'Political Copernicanism', was the argument that, if the Sun was the unquestioned centre of the cosmos, so the King was the unquestioned centre of the state, and had therefore to be obeyed without question. The authoritarian qualities of Political Platonism itself reached their final form in the clock-work cosmos of Thomas Hobbes (1588-1679), the English political philosopher and an admirer of Galileo's new physics. In 1651, showing clearly his debt to Galileo and taking the universe of natural forces, rather than divine intent, to its logical conclusion, Hobbes (1962, Chap. 46, p. 482) wrote,

*"The universe, that is, the whole mass of things that are, is corporeal, that is to say, body; and hath the dimensions of magnitude, namely length, breadth and depth: also, every part of body, is likewise body, and that which is not body is no part of the universe: and because the universe is all, that which is no part of it is nothing."*

Hobbes' philosophy, though, while it appealed to the mathematical order which was so central to Platonic cosmology, banished psyche, or soul, from celestial mechanics. In this sense we should regard Hobbesian political thought as 'Political Galilean', after the astronomer who inspired Hobbes' belief that the state was as mechanical in its working as the universe. Hobbes' conclusion was that the 'Body Politic', like the Celestial Body should be tightly regulated, and the machine of state kept in good working order.

Until the seventeenth century, the consequences of astronomical thought for politics tended to be authoritarian, either because it was designed to support royal power, or on account of the presumed subordination of human action to celestial law. A reversal in this equation was effected by 'Political Newtonianism'. The political impact of Isaac Newton's was based on the simple logic that, if the entire universe is subject to a single set of natural laws, then human society must be subject to the same laws. Further, if kings and commoners are then subject to the same laws then, the claim was made, the

elevation of one over the other is contrary to natural law, setting the state on a collision course with the cosmos. That this is the restatement of an astrological commonplace which can be traced back to the cosmic states of ancient Egypt and Babylon, did not lessen its impact as a foundation of modern political thought. It was the conclusion which was radical: that monarchical power as the expression of the cosmos should be replaced by the will of the people as the expression of celestial law. The resulting set of ideas was largely developed by John Locke (1632-1704), a close friend and admirer of Newton, as well as a persuasive advocate of the concept of a mechanical, material cosmos, is known as Natural Rights theory; it proposes, simply, that human rights are inherent in nature, built into the very fabric of the cosmos (Locke 1975, 1988; Axtell 1986).

When modern human rights theorists locate the basis for their arguments in nature, they owe a huge debt to Newton; human rights, in the Newtonian sense, are inherent in the very condition of being human, and are not dependent on any human action (Nino 1993). As the Universal Declaration of Human Rights puts it, '*All human beings are born free and equal in dignity and rights. They are endowed with reason and conscience and should act towards one another in a spirit of brotherhood*' †. Carl Becker (1958) demonstrated convincingly that this line of reasoning was very popular amongst eighteenth-century American radicals, for whom the *Principia* became a political rather than mathematical text, was to find its first and fullest expression in the constitution of the United States of America. Margaret Jacob (1976) made the same argument in the case of English radicals. In France, Voltaire (1694-1778), perhaps the eighteenth century's most eloquent theoretician of the emerging ideas of human freedom, argued strenuously that the lessons of astronomy should be applied to politics. He revered Galileo and Kepler, but saved his greatest praise for Newton whom he elevated to a semi-divine status. His praise was almost ecstatic: "*if true Greatness consists in having receiv'd from Heaven a mighty Genius, and in having employed it to enlighten our Minds and that of others; a Man like Sir Isaac Newton, whose equal is hastily found in a thousand Years, is the truly great Man*" (Voltaire 1926, p. 65).

Voltaire had discovered Newton while in exile in England in 1726-8, and had become an instant convert, introducing Newtonian mechanics to the French world in his *Eléments de la philosophie de Newton*. Voltaire's lover, Émilie du Châtelet, who was one of the most brilliant scientists of her day, apparently wrote two of the mathematical chapters in the *Éléments*, then completed the first translation of the *Principia* into French, along with her own commentary, in 1749 (Ehman 1986). And so, the notion of a universe governed by a single set of natural, mathematical laws, spread throughout Europe: by 1789 the *Principia* had been published in eighteen successive editions, supported by numerous popularisations, including forty in English, seventeen in French, eleven in Latin for conservative scholars, plus three German, one Portuguese and one Italian (Randall 1962, Vol. 1, p. 571).

Newton recast the Platonic cosmos in terms of demonstrable formulæ rather than abstract numerological speculation. And, in following the early Church Fathers in making humanity responsible to God directly, rather than via a hierarchy of planetary spheres, he democratised a political cosmology which had embodied inequality in its essential structure. Newton's cosmos was essential egalitarian. There is, to be sure, a contrary view that the notion of celestial law is a sort of imperialistic, anthropomorphic projection of humanity's insecurity and need for law on to the cosmos. There is indeed a case to be made, but the eighteenth century natural-rights philosophers were self-consciously doing the opposite, taking what they thought were cosmic laws and projecting them on to their

† United Nations Universal Declaration of Human Rights, [www.hrweb.org/legal/udhr.html](http://www.hrweb.org/legal/udhr.html)

own societies an attempt to liberate themselves from the theory and practice of absolute monarchy.

Amongst the Newtonians, political Platonism, in which the state was to be made more efficient by being closely tied to a mathematically ordered cosmos, assumed a radical new form in the work of the French radical, Auguste Comte (1798-1857), the founder of sociology and one of the most significant influences on modern socialism. The foundation of sociology was laid in Comte's massive *System of Positive Polity*, first published in Paris in 1851-4, reveals it to be rooted in a deeply authoritarian version of Platonic social engineering. Comte's fundamental hypothesis was that the trinity of Kepler, Galileo and Newton had engineered a revolution in human understanding of the cosmos, but that humanity's political condition remained mired in the institutionalized superstitions of the Middle Ages, by which he meant monarchy (Comte 1875, Vol. 1, p. 847). The revolution of 1789, he argued, following Saint-Simon, had fatally wounded the old order but had failed to completely destroy it, followed as it was first by Napoleon's empire and then the restoration of the Bourbon kings. Comte believed devoutly that, through the traumas and crises of the French revolution, the world was gradually becoming a better place and that, following the revolution of 1848, the law of progress was in its final stages. He termed the destructive revolution of 1789 the negative revolution; the coming revolution which was to institute the new era, was the positive revolution. His fundamental proposition was that, if Kepler and Newton had discovered the laws of celestial motion and, if these were universal, then they must apply to all things on earth, including human behaviour and relationships. These laws, as Newton had demonstrated, were mathematical and therefore, logic dictated, the rules which governed human behaviour must be exactly the same as those which governed the heavens. People, Comte reasoned, moved in the same relation to each other as did planets. In theory, it should therefore be possible to investigate human behaviour mathematically with sufficient precision to identify the manner in which they conformed to Newtonian law. Comte's cue for this reasoning was contained within Newton's preface to the *Principia*, in which he had written, "*I wish we could derive the rest of the phænomena of nature by the same kind of reasoning from mechanical principles*" (Newton 1995, p. 5), but concluded that this was not possible within the current state of knowledge. Pierre Laplace shared Newton's aspiration to describe the entire universe with one set of laws in what J.T. Merz called the '*astronomical view of nature*' (Merz 1896, Vol. 1, pp. 341-8). This was the context within which Comte was working when he set out to complete Newton's plan, to explain, if not all of nature, at least human behaviour, according to celestial mechanics, and laid the foundations for modern sociology.

Like Plato, with whose political thought they were intimately familiar, the Enlightenment philosophers were attempting to model human society on celestial law in order to maintain peace and restore harmony. The consequences of Newtonianism permeate western thought, wherever there has been a search for a universal law based on supposedly hard data. Economics and sociology are prime examples, as is psychology. When the word '*psychology*' was coined around 1800, it was thought that, since Newtonian science explained everything that exists and occurs in the material world, there could and should be just one science explaining what exists and occurs in the psychological world. As Gilbert Ryle, a sceptic concerning the idea that mind existed separately to matter, put it, '*Psychology* was supposed to be the title of the empirical study of '*mental phenomena*', a counterpart to Newtonian celestial mechanics (Ryle 1949, p. 301). Concepts such as normality and deviation have dominated some of the major schools of western psychology, their roots in Newtonian cosmology's devotion to predictable order unrecognised and forgotten. Even the Freudian notion that psychic material can be '*repressed*',

as if by some kind of downward pressure, is derived from Newtonian mechanics via the influential German physicist Hermann von Helmholtz (1821-1894) (Bernfeld 1944).

The creation of sociology represented the most important application of astronomy to the management of the state, but I will conclude by reference to more recent attempts to apply cosmology to political thought. There have been a few attempts, for example, to identify Einsteinian relativity either as a form of political discourse, or to draw political implications from it. As far as the former is concerned, I refer to the Belgian feminist and social theorist Luce Irigaray who has identified the theory of relativity as a political rather than scientific formula: “*Is  $E = mc^2$  a sexed equation?*” Perhaps it is. Let us make the hypothesis that it is insofar as it privileges the speed of light over other speeds that are vitally necessary to us. What seems to me to indicate the possible sexed nature of the equation is not directly its uses by nuclear weapons, rather it is having privileged that which goes faster (Irigaray 1987; Sokal & Bricmont 1998).

Sokal & Bricmont (1998), meanwhile, noted how the notion of relativity in time and space was used by postmodern theorists in order to advocate cultural relativity on the grounds that, if the universe has no single centre, neither does culture. Holly Henry (2003) argued, with a specific examination of Virginia Woolf’s writing, that the discovery of the expanding universe and the realisation that our galaxy was just one of many became a metaphor for political insecurity in the 1930s. Denis Cosgrove (2001) made a persuasive argument that the photographs of the Earth taken by Apollo astronauts in 1969 encouraged concepts of the global village, of a world devoid of racial divisions, religious schism and political boundaries. Lastly Zohar & Marshall (1993) attempted to adapt the uncertainty principle from the sub-atomic level to the social, arguing that quantum mechanics can be used as an argument against the power of tradition and in favour of personal freedom.

Bruno Latour’s argument, with which I opened this paper, is a challenge to the claims of modernity that modern political thought is necessarily more rational than it was in pre-modern or even prehistoric periods. That there appears to be a long-term continuity in the tendency of political thinkers to apply cosmological and astronomical theory to models of the state, regardless of the scientific character of those theories, lends credence to Latour’s thesis. I would argue that modern thinkers are as inclined to formulate ‘*cosmic states*’, applying astronomy to human behaviour, as were those of the ancient Near-East.

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