Report of Activities 2017-2020
EarlyModernCosmology

ERC Consolidator Grant 2016
Institutions and Metaphysics
of Cosmology in the Epistemic Networks
of Seventeenth-Century Europe

Horizon 2020 Research and Innovation Programme

GRANT AGREEMENT	GA 725883
PRINCIPAL INVESTIGATOR	Pietro Daniel Omodeo
HOST INSTITUTION	Ca' Foscari University of Venice (IT)

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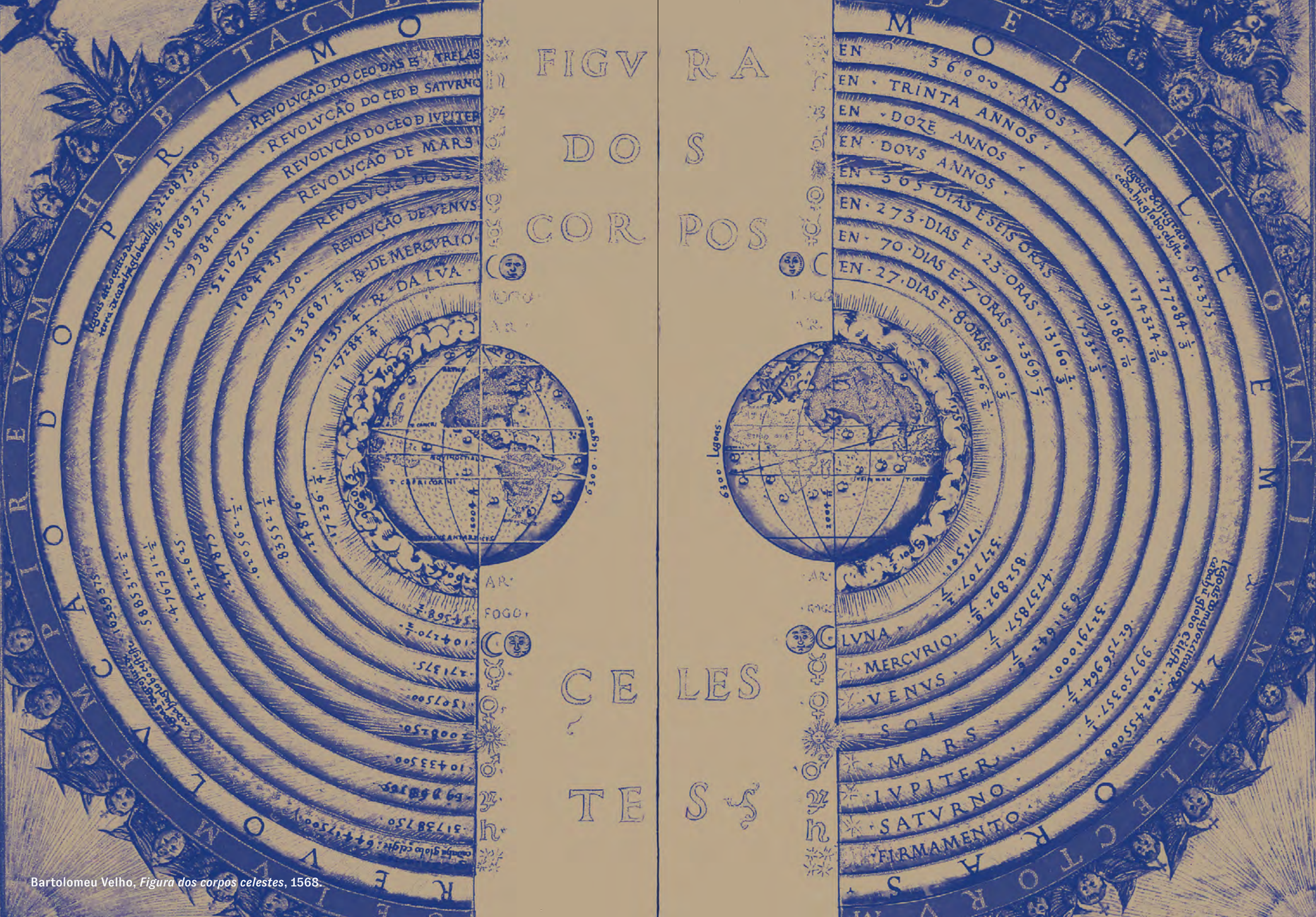


Bartolomeu Velho, *Figura dos corpos celestes*, 1568.

Summary

Institutions and Metaphysics of Cosmology in the Epistemic Networks of Seventeenth-Century Europe

The Early Modern Cosmology research endeavor utilizes a two-pronged approach to the study of early modern cosmology. It proposes a comparative inquiry into early-modern cosmologies by placing them in the context of their institutional, political, religious, and ideological settings, and also employs these case studies to make broader, more methodological reflections in a new area of historical epistemology we refer to as 'political epistemology'.

Cosmology—the knowledge of the order, constitution, and motions of the world—was a field of acute ideological struggles in early modernity. The fact that such polemics were often inserted into a religious framework should not obscure the eminently political character of the many and diverse attempts to hegemonize scientific debates through cultural, educational, and editorial means. The formation of competing communities can also be seen in the rise of academic and scientific networks that were united by confessional and political ties. For example, the confessional embedment of cosmology in the framework of the late Scholasticism of Jesuit colleges stood in stark opposition to similar efforts in other settings—such as in the mobile topography of interlinked Protestant universities or the claims for autonomy that were made by philosophy professors at the University of Padua. Our study of the religious-political drives behind many early-modern European cosmological skirmishes (in astronomy, physics, philosophy, and epistemology) makes a significant contribution to the political understanding of the advancement of science. Furthermore, because these cultural conflicts over cosmology concerned the categories of science itself, and not merely the content produced by scientific activities, it is also essential for the ERC endeavor to engage with epistemology. Therefore, we inquire into the historical developments of science from the viewpoint of the metaphysical and epistemological principles of the science of the time, as well as from the viewpoint of present-day questions about the nature of our scientific modernity.

Our Perspective

> By derivation from the Authentic Cosmos, one within itself, there subsists this lower Cosmos, no longer a true unity. It is multiple, divided into various elements, thing standing apart from thing in a new estrangement.
>
> Plotinus, *Enneads* III 2,2

> Who is able to put himself in this kind of "standpoint of the cosmos in itself" and what could such a standpoint mean?
>
> Antonio Gramsci, *Prison Notebooks* XI

> No single astronomical system, the Copernican as little as the Ptolemaic, can be taken as the expression of the 'true' cosmic order, but only the whole of these systems as they unfold continuously according to a definite connection.
>
> Ernst Cassirer, *Substanzbegriff und Funktionsbegriff*

These three quotations provide an excellent preamble to the intellectual foundations that guide our research in the ERC consolidator endeavor "Institutions and Metaphysics of Cosmology in the Epistemic Networks of Seventeenth-Century Europe" (*EarlyModernCosmology*). Following Plotinus, we understand that the cosmological discourse from antiquity until the present day was embedded in theological and metaphysical frameworks; Gramsci introduces an essential critique of the ideological assumption that an extra-historical access to nature is possible; and Cassirer confirms the necessity of investigating the objectivity of cosmology—understood as the study of the world as whole—in terms of cultural processes. Our endeavor draws on these insights to interpret the competing discourses on early modern cosmology in their institutional and metaphysical contexts.

The threshold of modernity in Europe was marked by acute political and ideological fragmentation, which gave rise to confessional and cultural clashes that transformed cosmological inquiry. Although knowledge is the collective endeavor *par excellence*, early-modern styles of thought could not be brought together owing to irresoluble hegemonic conflicts. The economic, political, and spiritual stakes of the science of the time can be seen in the example of mathematical astronomy, which

was indispensable for navigation and cartography and therefore an essential instrument of colonial expansion; in addition, its philosophical implications at the level of cosmological worldviews were burdened with theological and metaphysical ramifications. In the seventeenth century, the inquiry into the physical and philosophical consequences of post-Copernican astronomy established new and more solid foundations for cosmology, which were implicated in very severe conflicts over the reconcilability of natural inquiry and the religious dogma. The divergent epistemic cultures that emerged in early modernity were institutionalized in the form of scholarly networks, which include the Protestant connections between northern European universities, the global organization of Jesuit colleges, and forms of resistance in academic centers struggling for their autonomy from religion following the Venetian model of philosophical freedom at Padua. Although the seventeenth century stands as a milestone in the social and metaphysical history of cosmology, we are equally interested in the antecedents that led to this dramatic century and its later repercussions.

Raffaello, detail from the *Scuola di Atene*, 1509-1511.

The intricate development of cosmological knowledge cannot be explained as a 'pure' development of thought. Early modern controversies over the order of the world reveal the profound historicity of all cosmological conceptions, including how their shifting ideological-political definitions and cultural dimensions act as the objective motor for transformative epistemic processes. Therefore, any study of the early-modern constitution of collective standpoints on the world requires a complementary methodological reflection upon political epistemology. The ERC project *EarlyModernCosmology* achieves a political-cultural reconstruction of the cosmology of the past as well as a clarification of the conceptual tools that are necessary for the comprehension of past struggles for scientific hegemony. Thus, our concrete historical studies serve as a springboard to address certain problems that have emerged in knowledge theory at the confluence of social constructionism, post-modern relativism, and neo-positivism.

By adapting and reworking our three leading quotes to relate to this particular juncture in time and epistemology, we can frame our historical enquiry using three leading questions:

Are political antagonisms, ideological struggles, and religious tensions a hindrance to scientific development or the fuel that ignites it?

How can the objectivity of science as a cultural product be secured?

What kind of truth of and about nature emerges from the history of the human exploration of the cosmos?

Histories: Case Studies

Epistemology:
A Reflection on Method

Group, Activities, Outcomes

Two ancients (Hipparchus and Ptolemy) and two moderns (Copernicus and Brahe) discuss astronomy. Frontispiece of Hevelius's *Machina coelestis*, 1673.

Histories: Case Studies

Cosmology within the Natural Debates of Early Modernity

As a research group, we investigate the emergence and consolidation of discourses on cosmology that culminated in the seventeenth century. Our historical inquiry is achieved through a series of interconnected case studies on the history of scientific concepts and their settings. We particularly look at the ideological and material dimensions present in these examples, because they reflect metaphysical concerns that explicitly or implicitly affected the science of the time and reveal the formative role played by institutional constraints upon the knowledge of the time.

The principal investigator, Pietro Daniel Omodeo, works on the 'long' Renaissance of cosmology in the sixteenth and seventeenth centuries. In particular, he explores the confessional and political struggles behind conceptions of the natural order, the cosmos, and science in a time in which traditional universities were confronted with the emergence of new scholarly institutions, scientific academies, and courtly culture. Omodeo reconstructs the social roots of cosmological ideas in institutions and their circulation via networks of scholars based at Protestant universities, Jesuit colleges, or inter-confessional centers such as the University of Padua. He aims to understand the development of scientific ideas in their two-sided dependency on ideology and institutions. In early modernity, cosmological orientation shaped and transformed ideas, society, and the world at a symbolic as well as a material level. The exceptional relevance of astronomy for the exploration, mapping, and conquest of the earth and the heavens led to exacerbated struggles for scientific hegemony over cosmology and cosmography.

EarlyModernCosmology benefits from Omodeo's expertise in early-modern cosmological debates. He has extensively worked on the history of post-Copernican astronomy, the natural discourses of early modernity, and historical epistemology. His previous work *Copernicus in the Cultural Debates of the Renaissance: Reception, Legacy, Transformation* (2014), which involved a cultural investigation of the plurality of themes and controversies connected with Copernicus's astronomy and its reception during the Renaissance up to the Roman censure of 1616, provided an important foundation for his current work with *EarlyModernCosmology*. While his past work mainly focused on the history of concepts, the ERC endeavor has opened up a new perspective into his investigation of early modern cosmology, because it is aimed

at a wider socio-cultural and ideological comprehension based on political and confessional comparative studies of scientific changes in the context of seventeenth-century institutional networks and religious divides. Comparative histories that present cosmology as a cultural practice offer the basis for a revised reflection on the cultural-political history of science and a new historical-epistemological understanding of the connection between science, ideology, and power. Moreover, an investigation of the contexts of early-modern scientific justification raises the question about the world-transformative function of cosmology beyond its ideological function. As a new perspective that has emerged from the project, Omodeo has been exploring the application of cosmological theories to geopolitical change in contexts as different as cartography—which is connected with European colonial expansion—and geo-environmental politics, which is connected to the politics of resource management.

In the following section, our historical inquiries are grouped around four areas:

1 **Exploring the Conceptual Boundaries of Early Modern Cosmology** relates to the history of cosmological concepts and ideas in their connection with various philosophical and natural traditions (such as neo-Platonism, Renaissance naturalism, Scholasticism) and overarching problems (such as heavenly influences, harmony, vitalism);
2 **Cosmology, Confession, and Cultural Politics** looks at the embedment of cosmology in religious and cultural-political contexts, paying particular attention to the Protestant, Catholic, interconfessional, and secular dimensions;
3 **Institutions, Networks, and Crossroads of Cosmological Exchange** concerns the connections between cosmology and society, including the socio-economic ground of institutions and networks. The research areas included here investigate the locations and structures behind the generation and circulation of knowledge, including the scholars who disseminated scientific knowledge (as 'networkers');
4 Finally, **Applied Cosmology** addresses the function of cosmology as a tool for the transformation of the world, which is exemplified in relation to nature (hydro-environmental management and geo-engineering) and in governance (cosmography in the service of colonization).

H1 Exploring the Conceptual Boundaries of Early Modern Cosmology

H1.1

Metaphysics and Institutions of Astrology from the Middle Ages to Early Modernity

There was once a time, not so very long ago, when astrology was studied, practiced, and taught in the finest medieval, Renaissance, and early modern European universities (both Catholic and Protestant, post-1517), where it was embedded within, and both generated and integrated many types of knowledge, including natural philosophy (together with cosmology), mathematical astronomy, medicine and theology. In the modern and postmodern worlds, on the other hand, astrology was removed from the map of legitimate knowledge—having been delegitimized as both knowledge and practice during the Enlightenment—in a process that is not yet fully understood, but is centrally concerned with the complex struggles for scientific, philosophical and theological hegemony. For all of these reasons and more, Rutkin is developing an argument that astrology in all its interrelated aspects and contexts—conceptual, institutional, confessional, socio-political and cultural—can provide a revealing case study for exploring the boundaries of early modern cosmology.

Using an interpretive framework that he has developed in earlier studies, Rutkin reconstructs astrology's status and locations in the relatively stable medieval map of knowledge ca. 1250 to 1500, focusing primarily on its scientific and theological foundations. Then he explores and analyzes the complex dynamics of how astrology's status changed, i.e. how it was delegitimized as knowledge and practice during the Enlightenment, and thus became a member of the so-called occult or esoteric sciences, and ultimately became the alternative language of knowledge and praxis that it is today. This epistemological shift—astrology's downgrading and removal from the map of legitimate knowledge—marked an epoch-making transformation from premodern to modern in both the histories of knowledge and of science, and had conceptual, institutional and confessional dimensions that Rutkin is exploring in detail.

Having traced some of the patterns of astrology's removal from the domain of legitimate natural knowledge in the Middle Ages and in early modern Europe, the biggest questions still remain, including: why was such a promising astrological synthesis uprooted and replaced during the seventeenth and eighteenth centuries? In addition to natural philosophical motivations, part of the answer will also come from the political domain, where astrology still played vitally active roles in the seventeenth century, but significantly less vital roles in the eighteenth. There is much to learn

about the institutions and metaphysics of early modern cosmology from exploring astrology's many both normative and intensely contested roles in the transformation from the medieval and early modern to the Enlightenment (i.e. modern) map of knowledge and practice. Rutkin's project is dedicated to exploring these issues in detail and over the longue durée.

Main outputs

PUBLICATION	H Darrel Rutkin, *Sapientia Astrologica: Astrology, Magic and Natural Knowledge, ca. 1250-1800*, (in the series, "Archimedes: New Studies in the History and Philosophy of Science and Technology," ed. by Jed Z. Buchwald), Dordrecht: Springer, 2019, 3 vols. Volume I, "Medieval Structures (1250-1500): Conceptual, Institutional, Socio-Political, Theologico-Religious and Cultural".

H1.2

Celestial Physics before Celestial Physics

Contrary to the widespread conviction that there was no celestial physics before Newton (or Kepler, at the earliest), the Aristotelian tradition developed a highly sophisticated theory of heavenly physics which connected causal explanations and mathematical modeling. Omodeo's inquiry into "Celestial Physics before Celestial Physics" looks at the Aristotelian roots and debates on the causes of celestial motion, the soul of the heavens, and celestial causes on earth (most prominently, in the case of sea tides). This research focuses on Italian university Aristotelianism (especially in the Padua School) but also looks at the European echoes of that scientific debate north of the Alps in the time of the first circulation of the Tychonic and Keplerian planetary systems.

Renaissance and seventeenth-century scholars furthered the medieval debates concerning whether celestial souls can legitimately count as the causes of the motions of celestial bodies. In particular, they discussed whether the rotation of the heavenly spheres (which are the carriers of the planets and the fixed stars around the cosmic center) was produced by a 'form', or soul. Before the concept of force was introduced into classical mathematical physics (between Kepler and Newton), Aristotelian philosophers causally explained celestial motions through 'separate movers' which they derived from *Metaphysics* XII and the interpretations

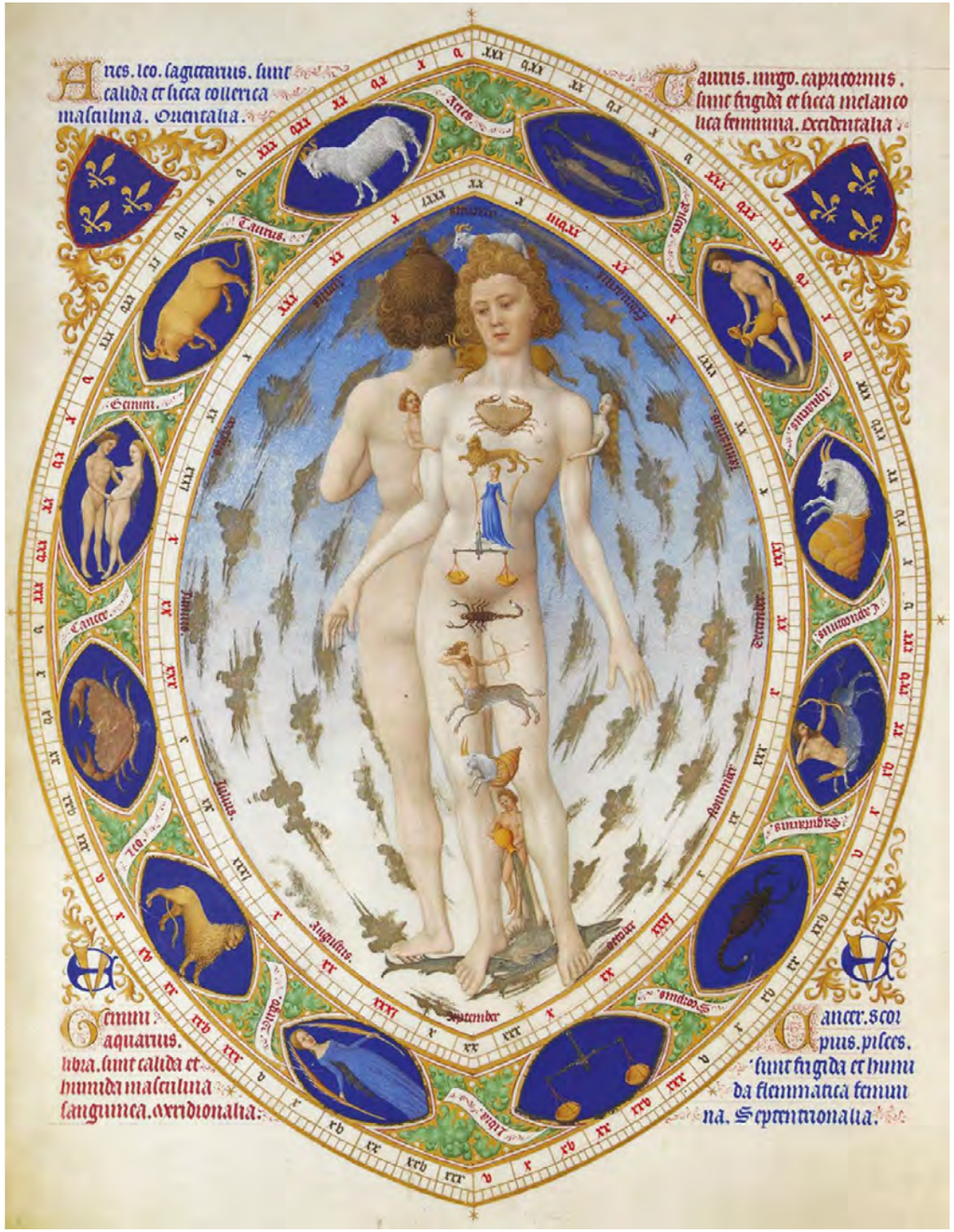


Image of the astrological man according to the Limbourg Brothers, "Anatomy of Man", sixteenth century. The Limbourg Brothers, *Très Riches Heures du Duc de Berry* (1400–1416), MS 65, fol. 14v (Reproduction Rights: Musée Condé, Chantilly). Available in the public realm.

Two angles maintaining the heavens in motion according to a Scholastic trope. From Münster, *Organum uranicum*, 1536.

of commentators such as Alexander of Aphrodisias and Averroes. This constitutes what we label as the Aristotelian path to celestial physics or 'Aristotelian psycho-dynamics' (a physics that considers 'souls' and 'intellects' to be the causes heavenly motions). Our inquiry takes into consideration Italian Scholastics such as Pietro Pomponazzi, Agostino Nifo, Gasparo Contarini, Jacopo Zabarella, and Cesare Cremonini. Their identification of the First Mover of the cosmos with the separate intellect of Aristotle's *De anima* triggered speculations on the cosmology of the *soul*, which were of great concern to ecclesiastical authorities because they touched upon the questions of the relation between souls and bodies and, ultimately, the immortality of the soul.

A further aim of this inquiry into Aristotelian 'psycho-dynamics' is to revise the widespread assumption that no *mathematical* program linked to celestial physics existed before Kepler. Early modern Aristotelians closely connected their own celestial physics with specific research into mathematical astronomy. Based on Andalusian predecessors such as Averroes and Alpetragius (al-Bitruji), they developed a specific approach to the geometrical modeling of celestial motions in line with Aristotelian celestial physics. Omodeo's research takes into account the most important exponents of this trend in the hotbed of late Aristotelianism, the School

of Padua. Giovanni Battista Amico, for one, drafted a 'homocentric' planetary theory which modelled the complexity of all celestial motions by bringing them back to the motion of concentric spheres in *De motibus corporum coelestium iuxta principia peripatetica, sine eccentricis et epicyclis* [On the motions of the celestial bodies according to peripatetic principles, without eccentrics and epicycles] (1537). The physician and natural philosopher, Girolamo Fracastoro (1538), authored *Homocentrica sive de stellis* [Homocentrics, or on the stars], whose conceptions even exploded the Aristotelian framework to include ideas (such as that of the *anima mundi*) derived from neo-Platonism. For a short time, Fracastoro's astronomy looked to be the most valid alternative to Copernicus's while Aristotelian 'psycho-dynamics' represented the only available celestial physics—until the emergence and consolidation of novel paths to mathematical physics between the end of the sixteenth century and Newton's work.

Main outputs

PUBLICATIONS	Pietro Daniel Omodeo, Jonathan Regier, "Celestial Physics," in *The Cambridge History of Philosophy of the Scientific Revolution*, ed. by Dana Jalobeanu and David Marshall Miller, Cambridge: Cambridge University Press (in press).
	Pietro Daniel Omodeo, "Presence/Absence of Alexander of Aphrodisias in Renaissance Cosmo-Psychology," in *Alexander of Aphrodisias in the Middle Ages and the Renaissance*, ed. by Pietro B. Rossi, Matteo Di Giovanni, and Andrea A. Robiglio, Turnhout: Brepols, 2020, 175-193.

H1.3

Neo-Platonic Cosmology: Ficino's Legacy

Marsilio Ficino (1433–99) played a fundamental role in the transition from medieval to early modern cosmology. In a nutshell, he almost single-handedly offered a complete Platonic cosmological alternative to the well-established medieval Aristotelian-Ptolemaic system in the late fifteenth century. He did this primarily through his translations and interpretations of Plato's writings as well as those of the Neoplatonists, such as Plotinus, Iamblichus, Proclus, and Plethon, which until that time had been little known in Western Europe.

One of Ficino's main contributions to cosmology was to portray the heavens as 'animated', much as Plato had done in his *Timaeus* and the Neoplatonists after him. Because he considered the still-geocentric world system as a living ensouled being—literally as an animal—Ficino provided an essential foundation for later iterations of vitalist cosmologies in the early modern period, including in astrology. Here Ficino also marked a new beginning, as he offered a characteristically Renaissance version of astrology and magic in his *De vita libri tres* (1489), which was published over thirty times in the next 150 years.

Ficino's work also contains significant lines of continuity with medieval Arabic and Latin traditions. Among other things, Ficino—the faithful Neoplatonist—still employed Aristotle as his main authority in the physical realm, including the 'astrologizing' Aristotelian employment of a geometrical-optical model for celestial influences, which used the stellar rays adapted in the thirteenth century by Roger Bacon and Albertus Magnus from al-Kindi's seminal *De radiis stellarum*. While Ficino certainly embraced this system, he also transformed it in a strikingly Neoplatonic direction by 'animating' the stellar rays as the extramitted radiation from living ensouled planets and stars, thus radically transforming the cosmological basis of his astrological and magical practices.

As part of the ERC endeavor, Rutkin coordinated together with Omodeo an international conference which offered new perspectives on Ficino's cosmology by examining a range of his sources and influences, and the reception of his writings in twentieth-century historiography, including by Edgar Wind and Ioan Couliano. Among other topics, we explored various sources in Ficino's work, such as his notion that the world is a plant (following Plotinus), and the question of whether Ficino's astrology had a theurgical aim (following Iamblichus and Proclus). Regarding Ficino's range of influences, we explored his impact on Leone Ebreo's *Dialoghi d'amore* (1535), on the interpretation of Plato's *Timaeus* in France in the work of Loys Le Roys (1551), on the astrological causes of the plague of 1577, and on the role of *spiritus* in the work of Girolamo Cardano and Johannes Kepler.

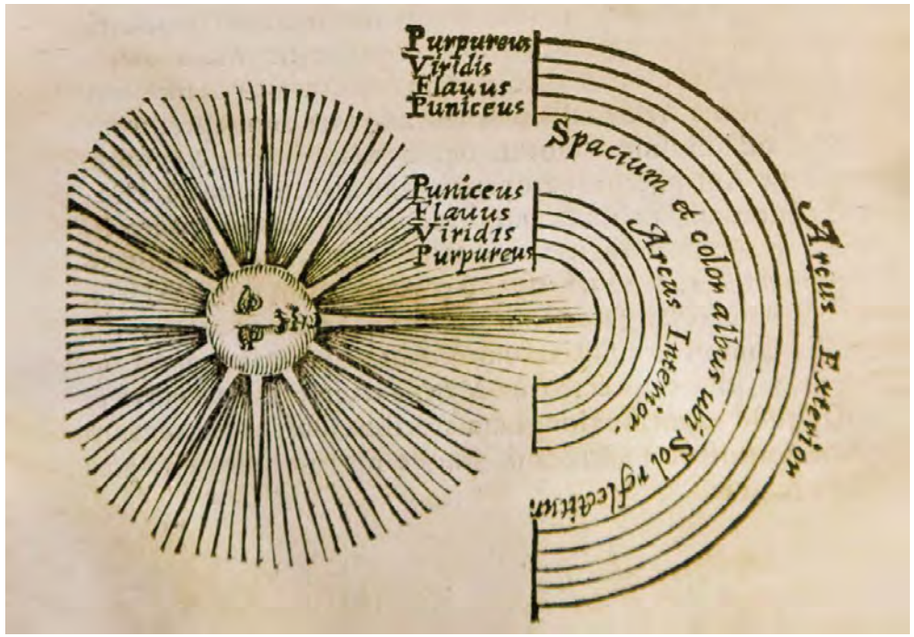
Main outputs

SYMPOSIUM	"Marsilio Ficino's Cosmology: Sources, Reception, Historiography" (Venice, 21-22 May 2019); organizers: Darrel Rutkin and Pietro Daniel Omodeo.

H1.4

Renaissance Naturalism: Telesio's Legacy

Bernardino Telesio's (1509–1588) idea that nature should be investigated 'accorded to its own principles' fostered a novel approach to the world. It was received both by Baconian experimentalism and incipient naturalism as a specific path to nature renouncing transcendence as an explanatory means. His approach was seen as a criticism of the principle of authority in the sciences and of an ancillary conception of philosophy as dependent on theology. A collective volume on Telesio's work, entitled *Bernardino Telesio and the Natural Sciences in the Renaissance* (2019) and edited by Omodeo, provides a timely reassessment of Telesio's work and his struggles with the intellectuals and religious authorities of his time. It forms an important contribution to a more complete understanding of the relations between science, philosophy, and religion in the cultural settings of early modernity, and also remedies the scarcity of secondary literature on Telesio in English. Omodeo gathered contributions from leading specialists of Renaissance science and philosophy, including Rodolfo Garau, which investigate the historical-scientific framework of Telesio's



An illustration of the rainbow in Bernardino Telesio's *De iride*, 1590.

conceptions of the world and evaluate their place in the history of early modern cosmology, science, and medicine.

Telesio's natural science is multifarious, rich and complex, and his legacy cannot be reduced to a simple schematic. His *magnum opus* is the fruit of a whole life dedicated to intense study and research aimed at revealing the first principles of nature and, at the same time, clarifying specific phenomena. The breadth as well as the attention to detail in Telesio's main work *De natura iuxta propria principia* results in the inclusion of questions that are apparently remote from a conventional understanding of natural science, for example the psycho-physical issues, anthropological problems, and ethical themes introduced in the third extended edition of the work in 1586. This variety is also characteristic of his minor writings and the posthumous booklets on natural science, a rich collection of scientific materials, which were printed by Telesio's loyal pupil, Antonio Persio, under the generic title *Varii de naturalibus rebus libelli* (1590). The issues discussed in Telesio's miscellanea ranged from comets to earthquakes, sea tides, and rainbows. The collection also included discussions on medical, physiological, and cognitive questions like respiration, taste, and sleep.

In spite of the apparent disparity of these questions, they cohere as a result of the author's visionary spirit and his grand project of a systematic treatment of the world. He accomplished this ambitious philosophical program in explicit opposition to the Aristotelian-scholastic tradition, which was still the reference point for university curricula of the time. The pillars of Telesio's philosophy were an epistemology based on the reliability of the senses and a dynamic view of nature, which he pitted against the abstract, and thus ill-founded, rational constructions of book-ish scholars. Telesio is emblematic of Renaissance culture in its aspiration towards universality. From a broader historical viewpoint, it is important to mention that Telesio's call for an autonomous investigation of nature, as well as his advocation of an empirical method, are two fundamental contributions to the transformations of the scientific framework of cosmological debates in modernity.

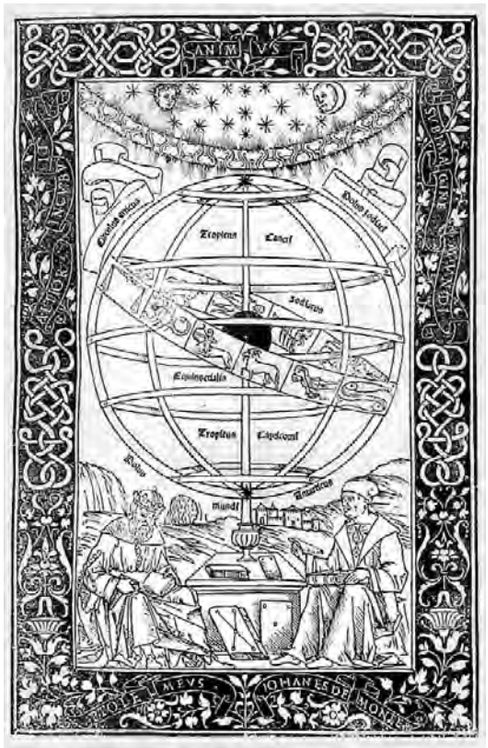
Main outputs

PUBLICATION	Pietro Daniel Omodeo, *Bernardino Telesio and the Natural Sciences in the Renaissance*, Leiden: Brill, 2019.

H1.5

The Planetary Earth: Early Controversies over Terrestrial Motion

The publication of Copernicus's major work in 1543, *De Revolutionibus Orbium Coelestium*, marks the point of transition in which the new theory of a heliocentric cosmology ceased being an obscure suggestion circulating among a restricted number of learned people and became a major issue in European scholarship and circles of patronage. Because Copernican cosmology understood the Earth to be a planet in motion, it generated what historians of science describe as the complexity of the reception of Copernicus's planetary theories, as well as intricate cultural debates over his achievement in the diverse fields of astronomy, physics, cosmology, epistemology, theology, and literature. However, Copernicus's major work was not the first time the viability of a heliocentric cosmology was discussed in the Western tradition. The viability of a geocentric cosmology was questioned in several Latin texts before the publication of Copernicus's work in 1543. Even though they defended geocentrism, these



The most prominent mathematical astronomer from the generation before Copernicus, Johannes Regiomontanus, debated the motion of the Earth with his pupils. Frontispiece of his *Epitoma Almagesti*, 1496.

sources show that the possibility of the Earth's motion was a disputable topic and that the idea of the Earth being at rest was not taken dogmatically by early modern Western scholars. Therefore, the controversies over terrestrial motion that emerged in early modernity are worthy of deeper examination in order to revise common academic assumptions. In view of creating an anthology of sources on the Copernican debates, Alberto Bardi and Pietro Daniel Omodeo have translated into Italian, and then commented upon, a relevant selection of Latin sources on the motion of the earth. These sources are representative of the Renaissance cultural setting in which the disputes on terrestrial motion provided a cradle for the development of new cosmologies and investigations into the physical properties of the heavens.

The sources under examination include: Regiomontanus, *An terra moveatur an quiescat disputatio*, in Johannes Schöner, *Opusculum geographicum* (Nuremberg, 1533); Nicolaus Copernicus, *Commentariolus* (ca. 1514); Celio Calcagnini, *Quod coelum stet, Terra moveatur* (ca. 1518); and Georg Joachim Rheticus, *Narratio prima* (Gdansk, 1540).

Main outputs

PUBLICATION	Pietro Daniel Omodeo, Alberto Bardi, "The Disputational Culture of Renaissance Astronomy: Johannes Regiomontanus's *An Terra Moveatur An Quiescat*," in *Early Modern Disputations and Dissertations in an Interdisciplinary and European Context*, ed. by Robert Seidel, Leiden: Brill (2020, in press), 233-254.

H1.6

Early Modern Thoughts on Natural Immanence: Cosmology, Natural Autonomy, and Freedom

In early-modern Europe, a number of thinkers began to speculate that the natural world was fundamentally autonomous and able to self-regulate, needing virtually no divine intervention. From an epistemological standpoint, such a conception paved the way for the idea that nature could be understood within its own principles and rules, which renounced or marginalized divine teleology and providence from scientific debates. This was extremely controversial, and heated polemics took place from the Renaissance up to the late seventeenth century over the question of

which role was left to God the creator and divine providence within the new framework. In this way, a new image of the cosmos, studied according to its 'own principles', emerged.

An often overlooked aspect of this story is that such an understanding of nature was not only the prerogative of heterodox and somehow out-of-the-box thinkers, such as Bernardino Telesio, but involved exponents of the Aristotelian tradition to varying degrees, especially those gravitating around the University of Padua. They used their advanced philological skills and argumentative capacity, as well as the relative protection from the Roman Inquisition they were granted by the peculiar political status of the *Serenissima*, to propound radical interpretations of Aristotelian cosmology. The work of the professor of philosophy Cesare Cremonini, who was a colleague of Galileo, provides one fascinating example of such a scholar. Cremonini's commentaries on *De coelo* propounded a cosmology in which God has no will or creative power—positions that qualify him as one of the most radical thinkers of the immanence of nature between Giordano Bruno and Baruch Spinoza. The Principal Investigator, Omodeo, reconstructs this lineage of cosmology as an articulation of an immanentist ontology.

The concept of self-preservation is closely connected with the understanding of nature as autonomous from transcendence. Rodolfo Garau investigates the early-modern transformations of the concept of "conatus" which was related to the problem of the inner tendency of all beings towards their preservation. This concept connected speculations on life, human and animal behavior, proto-inertia, and cosmic order. To express such ideas, writers of the time often employed a concept that enjoyed great popularity then: "conatus" with its verbal form "conor", which can be (and was) translated with "(to) endeavor", "(to) strive", or even "(to) tend." The concept of conatus was employed by a number of prominent early modern philosophers such as Descartes, Hobbes, Spinoza, and the young Leibniz—authors for whom the concept had extraordinary significance—and among physicists such as Huygens and Newton. It then fell into disuse in the eighteenth century. It can be said of this concept, perhaps more than of any other, that it represented a specific trait of the early modern worldview.

Spinoza, the philosopher of immanence *par excellence*, claimed that all things in nature possess a conatus to preserve their own being (*Ethics*, III 6). His reflection represents an extension of Descartes' laws within an immanentist framework. Del Nonno, whose PhD thesis deals with the development of Spinoza's thought of immanence in relation to the

Spinoza's thought was the culmination of an immanentist conception of the world which had already been defended, in different ways, by Bruno and Cremonini. This is an image of a monument dedicated to him in front of his house in The Hague.

scientific culture of his time, pays particular attention to the idea that Spinoza's cosmology should not be understood as an outcome of the post-Copernican debates in the first place, but within the debate about the order of nature in natural philosophy. This perspective is fundamental in order to clarify Spinoza's later introduction of the *facies totius universi*. "The face of the whole Universe, which, however much it may vary in infinite ways, nevertheless always remains the same" (Ep. 64) plays a central role in Spinoza's *Ethics* and corresponds to the infinite mediate mode of the extension. This is absent in his early writings, in which there is only the infinite mode of the substance, which corresponds to the universal laws of the whole nature. The development of Spinoza's account of the universe and the introduction of the infinite mediate mode reveals his attempt to mediate between the particular laws of each things and the universal order of nature. The intersection between different contexts (experimental philosophy, Scholastic debates about mereology, and theological struggles) assists in understanding the key role of Spinoza's account

of the universe in its connection with ethical concerns. His 'onto-cosmology' has relevant political and practical consequences, insofar as human beings' capacity to achieve higher degrees of freedom always depends on the relevant material and political contexts. Del Nonno investigates the connections between metaphysics, physics, and ethics in Spinoza's vision of nature, particularly in relation to his conception of freedom. Spinoza's departure from an early ethical intellectualism (in which adequate knowledge is necessary and sufficient to achieve freedom) towards a dynamic account of freedom has strong practical connotations and concerns the way in which individuals operate and cooperate in the world.

Main outputs

PUBLICATIONS	Rodolfo Garau, "Conatus," in *Encyclopedia of Early Modern Philosophy and Science*, ed. by Dana Jalobeanu and Charles T. Wolfe, Dordrecht: Springer Online, 2020.
	Rodolfo Garau, *Conatus: History of an Early Modern Concept,* International Archives for the History of Ideas (manuscript, under contract by Springer), forthcoming.
	Pietro Daniel Omodeo, "A Cosmos without a Creator: Cesare Cremonini's Interpretation of Aristotle's Heaven," in *Journal of Early Modern Studies*, 8 (2019) 9-42.
EVENTS	Reading group organization by Garau and Omodeo, "Nature with(out) God" at the Bucharest-Princeton Seminar in Early Modern Philosophy (Bran, Romania, 27 June 2019).
PRE-DOC RESEARCH ACTIVITY	Omar Del Nonno's PhD thesis on "The Development of Spinoza's Thought within the Scientific Debates and Political Context of the Seventeenth Century."

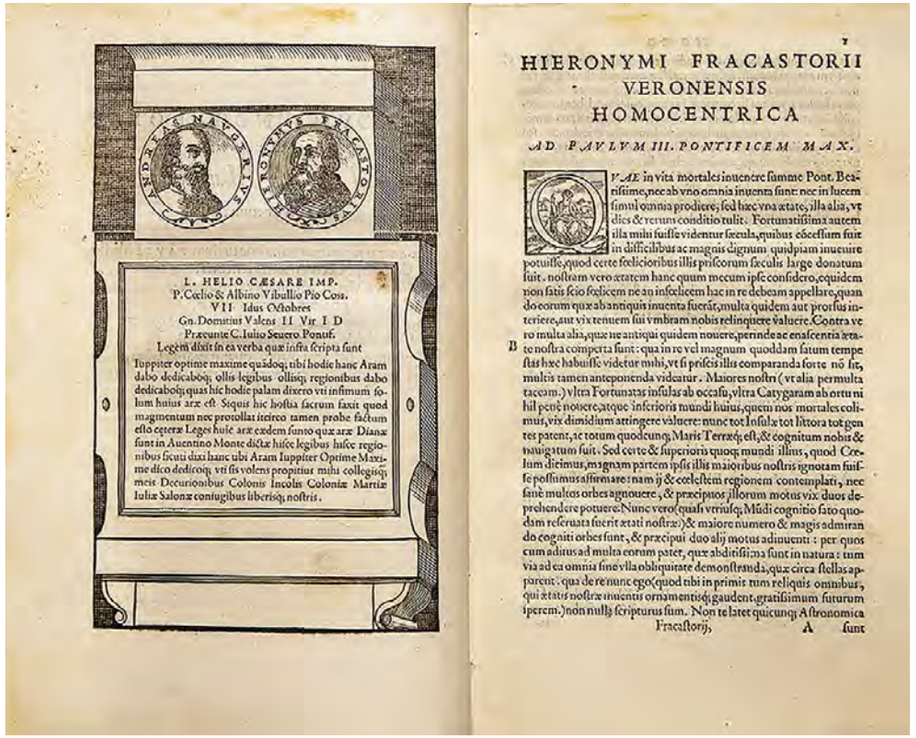
H1.7

Historical Epistemology of Life and the Cosmos

Vitalism points to a central problem of early modern conceptions of the world and life. One could distinguish between two forms of early modern vitalism: cosmic and immanent. The first kind refers to a vision of the cosmos as a living animal, while the second understands vitalism as emerging from and limited to organic bodies. Current research by

Charles T. Wolfe aims to produce a philosophical 'counter-history' of biology in which the focal point is vitalism in its successive incarnations and definitions, with a focus on the modern period—the period extending from the Scientific Revolution to the end of the Enlightenment. This constitutes the epistemological background against which cosmological and immanentist forms of early modern vitalism can be understood.

Vitalism was classically understood as the most extreme, supernaturalist position regarding the uniqueness of biological entities, and as such it was rejected as a pre-scientific embarrassment in mainstream scientific and philosophical discourse. But careful historical scholarship reveals the existence of different forms of vitalism, some of which are deeply interwoven with positive developments in medicine, physiology, and experimental biology overall. In contrast to the usage of the term 'vitalism' in Anglophone scholarship on the Renaissance and early modern philosophy—where it is applied to authors like Margaret Cavendish, Anne Conway, and sometimes Henry More to mean something akin to 'panpsychism', namely, the presence of 'mind' throughout matter—Wolfe makes use of more precise contexts derived chiefly from the history and philosophy of the life sciences, principally the doctrines associated with the Montpellier Faculty of Medicine in the eighteenth and nineteenth centuries. This can be seen as a particular case of practicing historical epistemology, but one which confronts this methodology with ideas and arguments derived both from twentieth-century 'biological philosophy' (in the Continental tradition) and contemporary philosophy of biology (in the analytic tradition). The goal is both a more careful (and nuanced) definition of vitalism (with an analysis of further subdivisions such as *metaphysical* and *non-metaphysical* vitalism), and an analysis of how vitalism is actively present in three key episodes in the joint development of biology and a kind of 'philosophy of life' (not reducible either to conceptual elements in biology or what will become 'philosophy of biology'). These include early-modern debates, specifically those between Leibniz and Stahl, which are fundamental for tracing the origins and developments of vitalism up to the present; the emergence of the concept of the organism in the early Enlightenment to the late eighteenth-century emergence of biology as a science; and, eventually, the shift to a more 'philosophical' and 'theoretical' form of vitalism in the twentieth century following Georges Canguilhem's work. Wolfe's project is both philosophical and historical in character, and it yields both a new vision of biology as a science and a new understanding of the role of 'biological' concepts in early modern thought.



L. HELIO CÆSARE IMP.
P. Cælio & Albino Vibullio Pio Coss.
VII Idus Octobres
Gn. Domitius Valens II Vir I D
Præeunte C. Iulio Seuero Pontif.
Legem dixit in ea verba quæ infra scripta sunt

Iuppiter optime maxime quādoq; tibi hodie hanc Aram dabo dedicaboq; ollis legibus ollisq; regionibus dabo dedicaboq; quas hic hodie palam dixero vti infimum solum huius aræ est. Siquis hic hostia sacrum faxit quod magmentum nec protollat itcirco tamen probe factum esto ceteræ Leges huic aræ eædem sunto quæ aræ Dianæ sunt in Auentino Monte dictæ huice legibus huice regionibus sicuti dixi hanc ubi Aram Iuppiter Optime Maxime disco dedicoq; vti sis volens propitius mihi collegiisq; meis Decurionibus Colonis Incolis Coloniæ Martiæ Iuliæ Salonæ coniugibus liberisq; nostris.

HIERONYMI FRACASTORII
VERONENSIS
HOMOCENTRICA
AD PAVLVM III. PONTIFICEM MAX.

VAE in vita mortales inuenere summe Pont. Beatissime, nec ab vno omnia inuenta sunt: nec in lucem simul omnia prodiere, sed hæc vna ætate, illa alia, vt dies & rerum conditio tulit. Fortunatissimæ autem illa mihi fuisse videntur sæcula, quibus cœcessum fuit in difficilibus ac magnis dignum quidpiam inuenire potuisse, quod certe felicioribus illis priscorum sæculis large donatum fuit. nostram vero ætatem hanc quum mecum ipse considero, equidem non satis scio fœlicem ne an infœlicem hac in re debeam appellare, quando eorum quæ ab antiquis inuenta fuerãt, multa quidem aut prorsus interiere, aut vix tenuem sui vmbram nobis reliquere valuere. Contra vero multa alia, quæ ne antiqui quidem nouere, perinde ac enascentia ætate nostra comperta sunt: qua in re vel magnum quoddam fatum tempestas hæc habuisse videtur mihi, vt si priscis illis comparanda forte nõ sit, multis tamen anteponenda videatur. Maiores nostri (vt alia permulta taceam:) vltra Fortunatas insulas ab occasu, vltra Catygaram ab ortu nihil penè nouere, atque inferioris mundi huius, quem nos mortales colimus, vix dimidium attingere valuere: nunc tot insulæ tot littora tot gentes patent, ac totum quodcunq; Maris Terræq; est, & cognitum nobis & nauigatum fuit. Sed certe & superioris quoq; mundi illius, quod Cœlum dicimus, magnam partem ipsis illis maioribus nostris ignotam fuisse possimus affirmare: nam ij & cœlestem regionem contemplati, nec sanè multos orbes agnouere, & præcipuos illorum motus vix duos deprehendere potuere. Nunc vero (quali vtriusq; Mũdi cognitio fato quodam reseruata fuerit ætati nostræ:) & maiore numero & magis admirando cogniti orbes sunt, & præcipui duo alij motus adiuncti: per quos cum aditus ad multa eorum pateat, quæ abditissima sunt in natura: tum via ad ea omnia sine vlla obliquitate demonstranda, quæ circa stellas apparent: qua de re nunc ego (quod tibi in primis tum reliquis omnibus, qui ætatis nostræ inuentis ornamentisq; gaudent, gratissimum futurum iperem.) non nulla scripturus sum. Non te latet quicunq; Astronomica Fracastorij, A sunt

Girolamo Fracastoro defended a conception of the cosmos as a living being in line with the Platonic tradition. This is the first page of his astronomical work *Homocentrica* in the edition of his *Opera omnia*, 1555.

Within the larger framework of early modern vitalism, cosmological debates were crucial to clarify a set of questions linked to the soul-body connection and animal motion on the basis of a widespread analogy between the celestial bodies and organic bodies. Among many instances of this phenomenon, Omodeo explores the lively debates on the life of the heavens which, in the Renaissance, brought together Averroist and Alexandrist accounts of heavenly souls moving celestial bodies (particularly, by Paduan Aristotelians such as Pietro Pomponazzi, Domenico Zabarella, and Cesare Cremonini), medical ideas about the cosmic origins of life (in authors such as Jean Fernel, Girolamo Cardano, and Daniel Sennert), and neo-Platonic cosmologies (e.g., by Girolamo Fracastoro). Early-modern supporters of cosmic vitalism met with the staunch opposition of theologians who feared the rebirth of forms of astrolatry, natural philosophers who wished to avoid the risks of cosmological homogeneity (among

them, influential Jesuit astronomers and natural philosophers), and early mechanists. These contexts show the interconnectedness of early modern discourses on life and the cosmos.

Main outputs

PUBLICATIONS	Charles T. Wolfe (ed.), coedited with Jonathan Regier and Boris Demarest, *Animism and its Discontents: Soul-Based Explanations in Early Modern Natural Philosophy and Medicine*, special issue of HOPOS (2020).
	Charles T. Wolfe, "Vitalism in early modern medical thought," in *Encyclopedia of Early Modern Philosophy and the Sciences*, ed. by Dana Jalobeanu and Charles T. Wolfe, Dordrecht: Springer Online, 2020.

H2 Cosmology, Confession, and Cultural Politics

H2.1

(De)Constructing Authority in Early Modern Cosmology

For a long time, the standard narrative of the astronomical revolution has been one that pitted the Copernican paradigm against the Aristotelian-Ptolemaic one. Thomas Kuhn's famous account of the cosmological shift that had taken place following the publication of Copernicus's *De revolutionibus* (1543) drew upon the argument by many *novatores* like Galileo that they had abandoned old authorities and bookish literacy in order to look at nature with unprejudiced eyes and secure methods. In line with such narratives, it has often been claimed that the early modern methodological shift in the natural sciences discarded authoritative texts. In their stead, new cosmologists founded their knowledge on empirical data and mathematics. Without entering the *vexata quaestio* concerning the gradual transformation of natural knowledge in the period against discontinuist historiography (according to which science advances through paradigmatic breaks and revolutions), this line of inquiry aims to explore and contextualize the notion of "authority" in early modern science, primarily in the fields that had been mathematized before the rise of the "new science", i.e., astronomy and, to a large extent, cosmology. By considering the argumentative strategies with which scholars either 'constructed' or rejected authoritative texts and concepts, this line of research will demonstrate that the turn to an experimental approach did not by necessity affect the epistemological value of "authority" usually associated with the pre-modern period. Controversies over natural/cosmological issues were often couched in terms of controversies over opposing authorities, such as Pythagoras versus Aristotle or Ptolemy versus Aristarchus. Accordingly, authorities were constructed and deconstructed by scholars of the time, together with contrasting histories about the origins and development of the relevant disciplines. The quest for those on whose opinions one could rely in the shifting world of early modern cosmological visions intensified; in this vein, the following case studies show that experimental and verified cosmological discoveries were not the only things taken into account by scholars who reconsidered the pantheon of reliable authorities in the field.

A collection of studies divided into two major strands, centered on the history of science in its institutional dimension and literary studies/intellectual history respectively, will address the problem in question in an interdisciplinary manner. From an institutional perspective, university curricula were based on authoritative *corpora*, while academies

celebrated their respective authorities. In such intellectual contexts, novel conceptions had to be brought into agreement with received ones and the spaces of innovation were a matter of constant negotiation and gradual transformation. Religious and philosophical drives, confessional adherence and cultural-political agendas often determined which scientific and cosmological methods and views counted as legitimate. From a literary and intellectual history perspective, the essays will deal with the ways in which early modern astronomers, natural philosophers, and intellectuals promoted their colleagues' achievements, on the one hand, or searched for evidence to claim their scholarly superiority and be considered authoritative, on the other. To uncover these literary strategies, our investigation pays particular attention to a variety of genres concerned with cosmology ranging from literary dialogues to scholastic *disputationes* and the extensive use of the classical tradition, including literary imitations, linguistic exercises, and abundant *topoi* taken from both Greek and Latin traditions usually intended to support one's scholarly ambitions. Also, the ways in which early modern astronomers structured their scientific argument to advertise and popularize their discoveries or convince the readers of their novelty and extraordinary importance will be addressed. In the latter case, a special focus is placed on paratexts and authors' interactions with the audience. Although some recent and insightful studies have touched upon the literary aspects of early modern cosmology, much remains to be done.

This research line is fostered through a collaboration between the ERC project in Venice, *EarlyModernCosmology* and the ERC project at the University of Innsbruck, NOSCEMUS, "*Nova scientia*: Early Modern Scientific Literature and Latin" (PI Martin Korenjak).

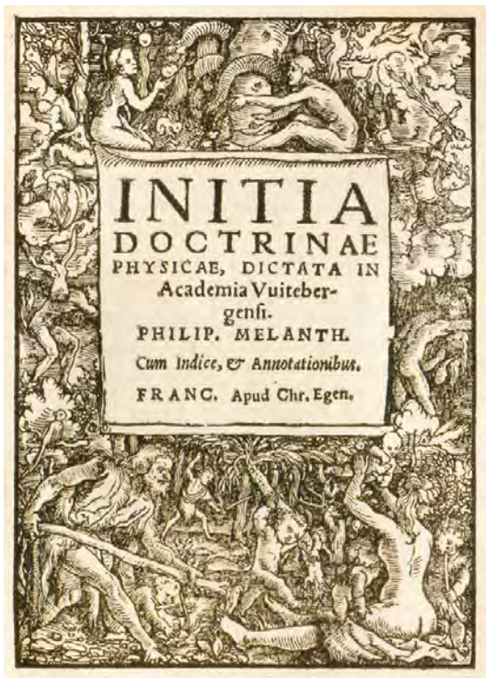
Main outputs

SYMPOSIUM	*(De)Constructing Authority in Early Modern Cosmology*, organized by Ovanes Akopian at the University of Innsbruck (7 June 2019), with talks by H Darrel Rutkin, Jacomien Prins, and Pietro Daniel Omodeo.

H2.2

Natural Knowledge and Aristotelianism at Early Modern Protestant Universities

The Aristotelian environment at reformed universities and institutions in early modernity is a suitable area to inquire into the productive tension between tradition and innovation which was characteristic of this time of intense scientific transformation. This area of inquiry, which is led by the Principal Investigator, is dedicated to the study of early-modern scientific knowledge and its categories within the confessional and cultural-political institutional settings of Protestant Germany. Institutional science was grounded on Aristotelianism as the backbone of knowledge. Protestant Aristotelianism, initiated by the university reforms of Philip Melanchthon, was a dynamic tradition. The teaching and circulation of knowledge through institutions often caused its deep alteration, even in those cases in which the explicit intention of the historical actors was to preserve and secure a received canon of knowledge such as the *corpus Aristotelicum* or Aristotelian methodologies of inquiry. As a matter of fact, across-pollination of 'early' forms of knowledge and 'modern' perspectives produced



A standard textbook of physics at early-modern Protestant universities: Melanchthon and Eber's *Initia doctrinae physicae*. Frontispiece of the 1550 Frankfurt edition.

changes of content, theory, and experience. The fields concerned with major hybridizations and shifts range from astronomy to astrology, medicine, soul theories, alchemy, physics, and biology. Because methodology was also reassessed and transformed in this process, fields such as logic, rhetoric, theories of argumentation, and epistemology should be regarded as an integral part of the early-modern transformation of *episteme*.

The encounter between Aristotelians and *novatores* who proposed new natural viewpoints must be considered in all of its ambiguity and complexity. Such encounters could take various forms ranging from adaptation to assimilation, transformation, demarcations, and exclusion. Our inquiry into the scientific culture of Protestant universities explores the conflicts and negotiations as well as the harmonization and synthesis of eclectic elements. In the sixteenth and seventeenth centuries, Aristotelianism proved to be a movable philosophy capable of interacting and merging with—and reacting to—impulses coming from many directions, for instance Parcelsism in medicine, Cartesianism in physics and physiology, and Ramism in methodology.

The confessional element of early modern philosophy and science continuously emerges as a significant epistemic drive. In the context of Protestant institutions, Aristotelianism was often connected with 'Philippism', or Melanchthon's intellectual and pedagogical legacy. The curricular reform that Melanchthon introduced at Wittenberg and spread throughout its institutional network was not restricted to theological faculties. The confessional implementation of a humanistic Lutheran culture with a marked Aristotelian bias effected astronomy (Erasmus Reinhold, Kaspar Peucer), physics (Paul Eber), alchemy (Andreas Libavius), and medicine (Daniel Sennert), to mention some of the most relevant fields and authors. Their legacy was particularly lively in late-humanistic centers such as the universities and gymnasia of Rostock, Helmstedt, Frankfurt on Oder, Copenhagen, Königsberg, Altdorf, and Marburg. Much research is still required to fully clarify the relevance of this intellectual process for the natural science that radiated far beyond German-speaking territories.

A particularly relevant instance of the institutional cosmology at Protestant universities is cosmology. A classic case in point is the Wittenberg reception of Copernicus on which much has been written but much still needs to be told on the basis of the reading of primary sources and manuscripts that have so far escaped historical scrutiny. Luther and Melanchthon's skepticism or even criticism relative to the Copernican hypotheses did not lead to the rejection of his astronomical work, but

rather to its transformative reception. The reconstruction of the institutional context of the earliest reception of Copernicus's *De revolutionibus orbium coelestium* (1543) helps us to understand the reasons for attempts to transpose Copernican parameters and models onto a geocentric framework, eventually onto a geo-heliocentric one, which became typical of Protestant circles from the 1580s onwards. Attentive consideration to the manuscript version and various editions of Melanchthon and Eber's *Introduction to Physics* (*Initia doctrinae physicae*) sheds new light on the intricacies of the so-called 'Wittenberg interpretation' of Copernicus.

Main outputs

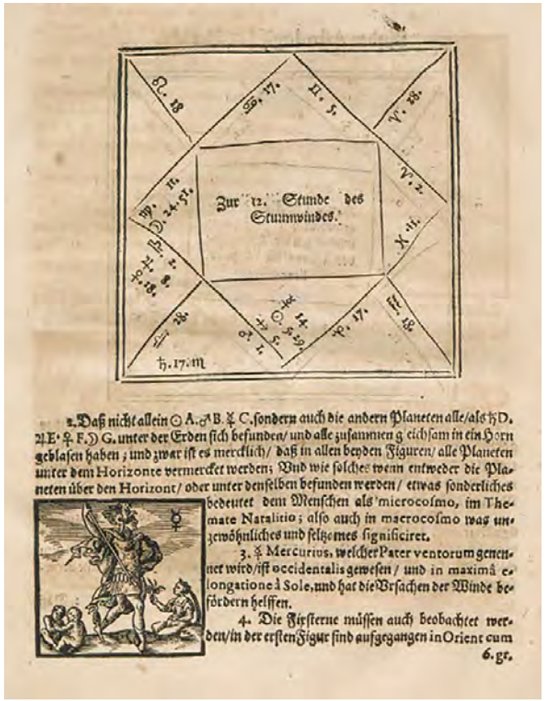
PUBLICATION	Pietro Daniel Omodeo, Volkhard Wels (eds.), *Natural Knowledge and Aristotelianism at Early Modern Protestant Universities*, Wiesbaden: Harrassowitz, 2019.

H2.3

The Institutionalization of Cartesian Cosmology in Seventeenth-Century Germany

This line of research explores the early reception of Descartes in Germany, particularly in the territories of Brandenburg-Prussia, at the University Frankfurt on Oder, and in the surroundings of the court at Cölln an der Spree (today's Berlin). It offers a novel insight into the scientific, cultural, political, and socio-institutional dimensions of early Cartesianism in German-speaking Europe during the seventeenth century. The specificities of this case study are emblematic of the broader issues at stake in the ERC endeavor because the dissemination of Descartes' ideas in Germany led to institutional controversies over the metaphysical foundations of cosmology at Lutheran universities. These disputes involved the fierce opposition of Aristotelians (often backed by theologians) and Cartesians, although at times they also included negotiated spaces of tolerance, or the merging of the two philosophical strands to create a sort of 'Scholastic Cartesianism'. The process whereby Cartesian ideas, including Cartesio-Copernicanism, were received and circulated exemplifies the transformation of knowledge in institutional networks.

Omodeo investigates the transformation of Cartesianism in Germany through the prism of the controversies that took place at Frankfurt on



An example of Cartesian astrology, the *Physicalischer und Astrologischer Bericht* (1661), from the Professor of Mathematics Johannes Placentinus at the University of Frankfurt on Oder.

Oder under Friedrich Wilhelm. The Duke's attempts to modernize his state following the Dutch model, and to pursue a deterritorialized confessional politics informed by international Calvinism, permitted a class of innovators to enter public administration and philosophical reformers, including Cartesians, to be appointed at university institutions. Among them, the Professor of Mathematics in Frankfurt Johannes Placentinus taught a relatively unorthodox Cartesian philosophy which unsettled both the local Aristotelian philosophers and scientific innovators abroad. For instance, in spite of Descartes' skeptical stances toward astrology, in 1660 Placentinus did not hesitate to teach that astrology was no conjectural science since it could be founded, as a *scientia demonstrativa*, on solid Cartesian ground. Omodeo relates Placentinus's example with further cases and cultural developments that took place in the same university setting, especially the physician-to-be Clemens Josef Brechtand his professor, the physician Tobias Andreae. Placentinus, Andreae, and Brecht were part of an international network of northern European scholars in Germany, Sweden, and Poland with strong connections in the Netherlands. They were involved in early Cartesian controversies, particularly

those opposing Descartes or involving censors such as Gisbert Votius or 'rationalists' like Henricus Regius, and disseminated his views abroad. In this context, the German reception of Descartes is particularly revealing of patterns surprisingly dissonant with respect to stereotyped images of Cartesian rationality. The Frankfurt professor of medicine Andreae went so far as to implement a demonological discourse based on the *Principia philosophiae*.

A novel image of early-modern Cartesianism emerges from this study in the socio-cultural history of science, medicine, philosophy, and their interdisciplinary connections. The micro-historical study of a cultural environment, which has remained unexplored until now, provides a clearer and more pluralistic image of Cartesian practices within institutions, and gives new insight into the wide range of theories and habits that could fall under the rubric of Cartesian philosophy, from mathematics to mechanics, matter theory, medicine, anatomy, demonology, and, most importantly for the ERC endeavor, cosmology. As such, this thorough study of the metaphysical, natural, and cosmological disputes at a Lutheran university is revealing of more general processes of the reception and transformation of scientific ideas in relation to metaphysical (theological and confessional) constraints typical in seventeenth-century Europe.

Main outputs

SYMPOSIUM COMMUNICATIONS	Pietro Daniel Omodeo, "*An vita hominis procedat ab materia coelesti subtilissima?* An Early Modern Dispute on Cosmobiology between Frankfurt/Oder and Wittenberg," at the conference *Aristotle and Natural Philosophy at Early Modern Central European Universities, 1600-1700* (Freie Universität Berlin, 21-22 Nov. 2019).
	Marco Storni, "Autonomy and Patronage: Science, Academy and Monarchy between Paris and Berlin," in *International workshop Scientific Academies* (University of Sydney, Australia, 22 November 2019).
PUBLICATION	Pietro Daniel Omodeo, "Asymmetries of Symbolic Capital in 17th-Century Scientific Transactions: Placentinus's Cometary Correspondence with Hevelius and Lubieniecki," in *Institutionalization of Science in Early Modern Europe*, ed. by Giulia Giannini and Mordechai Feingold, Leiden: Brill, 2019, 52-80.

H2.4

Catholic Settings: Arguing about the Stars on the Southern Side of the Confessional Divide

Between the sixteenth and the seventeenth centuries, Italy, France, and the Iberian Peninsula, areas that were largely marked by Catholic cultural politics, staged heated religious controversies and political clashes which directly affected scientific culture. In these places the control, organization, and direction of science and scientific institutions became a fundamental asset in the attempt to hegemonize intellectual discourse. Cosmology, more than any other field, was at the center of such conflicting cultural agendas because of its theological, metaphysical, and anthropological bearings; it was far from being perceived as a domain of neutral mathematical inquiry.

The cultural processes that led to the Catholic censure of Copernicus and the Galileo Affair have become paradigmatic in the history and philosophy of science because they raise questions concerning 'modern' scientific rationality and its relation to religion. Scholars have reconstructed the motivations behind and the arguments advanced by conflicting epistemologies (typically, the opposition between Galileo and Bellarmine). The historical context has been investigated at the micro-historical level concerning more or less famous episodes of censure. Moreover, scholars have also inquired into the religious values that informed scientific theories and practices. Much scholarship has dealt with the two-sided attitude of Jesuit scientists towards the 'new science'. Furthermore, specific studies have been devoted to scientific education at universities in Catholic countries including Italy, France, Southern Germany, and on the Iberian Peninsula.

But a scholarly understanding that can integrate the various dimensions (political, religious, and intellectual) of these scientific debates in Southern and Catholic Europe is still a desideratum. The need for such an inquiry is particularly urgent because scholars have prevalently focused on northern Europe when investigating the role of religious identities

Right: The Jesuit astronomer Giambattista Riccioli, in his *Almagestum Novum* (1651), presented the geo-heliocentric system of the world as the only planetary theory compatible with Aristotelian physics and Biblical literalism after the Roman censorship of Copernicus and the condemnation of Galileo. In the frontispiece of his work the hundred-eyed giant Argos (left) discusses telescopic observations with the muse of astronomy, Urania (right), who is assessing the weight of different planetary systems.

and universities in the formation of the early modern scientific culture, and comparatively less attention has been paid to science in the institutional networks of the southern countries. Furthermore, although many documents related to Inquisition trials of scientists have been published, the connection between education and censorship has not been studied in enough detail.

The crucial problem that still has to be addressed concerns the function of political actors as mediators between the truth claims of science and religion. Scientific knowledge, rooted in particular geo-political and institutional settings, constantly revised its relation with the universal truth that was repeatedly reaffirmed as a form of loyalty to the 'universal' religion. In this context, the endorsement or the censorship of institutions, theories, or individual scholars became intrinsically political. Collectively, we investigate such entanglements as expressions of the early modern cultural politics of science. In particular, we consider the political and institutional dimensions of cosmology in the confessional context of Counter-Reformed Europe through a series of comparative case studies, addressing the crucial research question of how cosmology was reshaped and transformed as a consequence of the interplay between political interests and religious agendas in the time of the Counter Reformation, the expansion of court society, and the formation of modern states.

Main outputs

SYMPOSIUM	Interactive Online Symposium, organized by Rodolfo Garau and Pietro Daniel Omodeo "Arguing about the Stars on the Southern Side of the Confessional Divide" (6 April 2020).

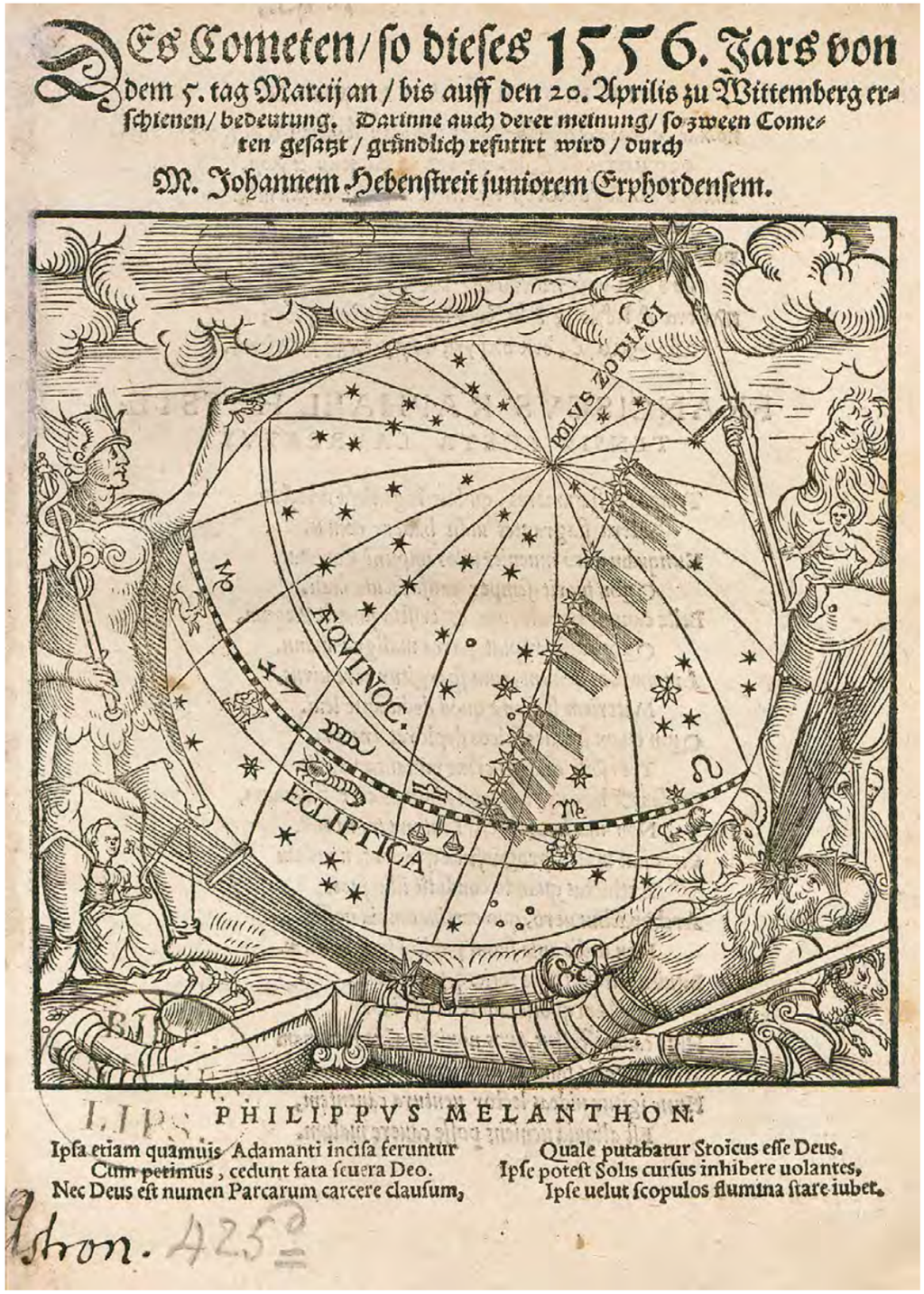
H2.5

Religious Struggles over Comets

The schism inaugurated by the Reformation in the Christian church in Latin Europe not only impacted theological beliefs but also transformed more general conceptions of the world that were present in early modernity. This research area addresses the case of comets as intrinsically inter-disciplinary boundary objects which had strong cultural connotations as well as the scientific relevance to be able to illustrate how

confessional convictions informed theoretical ideas about nature. German vernacular pamphlets and broadsides on comets from the sixteenth and seventeenth centuries offer a unique insight into a multifaceted discourse concerning knowledge of heavenly phenomena. This literature reflects various but interrelated approaches to comets that produced manifold views on their nature, their interpretation, and their relevance. Socio-culturally speaking, the discourse is shaped by the interaction of 'high' and 'low' culture and thus represents an early form of the popularization and democratization of knowledge. In the early modern period, comets were regarded as frightening, near-inexplicable phenomena sent by God. In this specific historical situation, which was an era in which religious and political instabilities and the crumbling of social and intellectual orders made people insecure, they felt the need to explain nature and cope with daily life by referring to the celestial sphere and its curious phenomena. In the framework of the ideological and confessional struggles for cultural and scientific hegemony, it is essential to ask who had

A representation of the comet of 1618 over Augsburg in a publication by Elias Ehinger. That apparition was often connected with the inception of the Thirty Years' War.



Frontispiece of a Renaissance astronomy opuscule in German with a representation of the trajectory of the comet of 1556 and a poem by Melanchthon.

the power to define and interpret comets as transitional objects between explanation, causation, and meaning. The working thesis of this inquiry is that the theoretical conceptualization and the symbolic interpretation of comets were interconnected, and both were strongly influenced by the religious settings of the cometary discourse. Interpreting comets as divine signs is an element of Christian theology and a perspective on nature that took different forms according to confessional affiliation in the aftermath of the Reformation. The reception of the Great Comet of 1577 is taken as a starting point in order to assess the denominational differences that informed conceptions of natural phenomena, which in turn paved the way for the cometary controversies of the seventeenth century. Anna Jerratsch works on the cometary pamphlets of the Catholic authors Johann Rasch and Johann Georg Schinbain and compares them with the Protestant ones by Jacob Heerbrand and Bartholomaeus Scultetus. Omodeo specifically considers atomistic and corpuscular motifs connecting the debates on new stars and comets in the sixteenth and seventeenth centuries in the works of a variety of thinkers: Giordano Bruno and Nicholas Hill's 'Epicurean' comets, Johannes Kepler's caution against neo-Epicurean interpretations of the nova of 1604 as a evidence that nature is ruled by chance in *De stella nova in pede Serpentarii* (1606), and post-Keplerian atomistic and corpuscular views on celestial novelties in the works of Pierre Gassendi and René Descartes.

Main outputs

PUBLICATION	Pietro Daniel Omodeo, "Epicurean Astronomy? Atomistic and Corpuscular Stars in Kepler's Century," in *Kepler's New Star: Context and Controversy*, ed. by Patrick Boner, Leiden: Brill (2021, in press).
WORKSHOP IN VENICE	Anna Jerratsch, MPIWG Berlin, "Religious Contexts of Discourses on Nature. The Comet of 1577 in Early Modern Germany" (11 December 2019).

H2.6

Secular Science in Court Society: Giovanni Battista Benedetti's Physico-Mathematics

The court philosopher and mathematical expert, Giovanni Battista Benedetti (1530–1590), developed an original kind of physico-mathematics which united an eclectic mathematical culture with efforts to renew mechanics, physics, and cosmology along an anti-Aristotelian and a-confessional line. His approach also offered the possibility of integrating post-Copernican astronomy within a new mathematical conception of physics. A reform of the fundaments of natural philosophy (around concepts such as space, time, and infinity) was part of his intellectual project as well. He dealt with practical problems that required mathematics, which ranged from the construction of meridians to astronomical devices for navigation, the solution of problems of perspective for painters and architects, and astrological calculation. His most important works and scientific achievements were realized at the court of Turin, and the multifaceted character of his writings was an expression of the secular court milieu to which he belonged.

At the court of Emanuele Filiberto of Savoy (featured in the portrait) and his successor in Turin, Benedetti wrote his work in physics-mathematics, *Diversarum speculation mathematicarum et physicarum libri*, 1585.

The Italian Renaissance was an age in which 'artist-engineers' were transformed into 'scientist-engineers' and, eventually, courtly 'mathematical philosophers' like Benedetti. It can be best understood against the background of the formation of a court society bridging feudal universalism and the global particularism of the modern national states. This specific research on Benedetti's major work in pre-Galilean physico-mathematics, *Diversarum speculationum mathematicarum et physicarum liber* (Turin, 1585), aims to show the social-political roots, strengths, and limitations of the science that emerged in court society (Omodeo, Jürgen Renn). This work was characterized by the dialogical openness typical of the court literati, the technical accuracy necessitated by a centralized administration, and the volatility of a personally patronized enterprise. A new edition published as part of *EarlyModernCosmology* in collaboration with *Edition Open Access* in Berlin (2018) discusses the *texts* and *contexts* of Benedetti's most daring insights on mechanics, the mathematical approach to natural investigation, and the connection of celestial and terrestrial dynamics from a post-Copernican perspective.

Main outputs

PUBLICATION	Pietro Daniel Omodeo, Jürgen Renn, *Science in Court Society: Giovanni Battista Benedetti's* Diversarum speculationum mathematicarum et physicarum liber *(Turin, 1585)*, Berlin: Edition Open Access, 2019.

H3

Institutions, Networks, and Crossroads of Cosmological Exchange

H3.1

Cultural Politics: Venetian Republicanism and the Padua Hub

Two case studies illuminate how Venice is the perfect observatory from which one can view early modern cultural politics.

The first strand of research addresses the cultural politics of Venice in relation to political theory. Gregorio Baldin investigates the presence of the Republic of Venice in European political thought, particularly in Hobbes, who read Paolo Sarpi's political writings. The Republic of Venice deeply fascinated the English cultural world during the sixteenth and seventeenth centuries because it represented a model of Republicanism and self-government. However, scant attention has been paid to the references to the Republic of Venice in Hobbes's works. Without a doubt, these references reveal the deep influence of Jean Bodin's *Le Six Livres de la Republique* in shaping Hobbes's opinion of Venice. However, the particular development of this topic in Hobbes's works must be analyzed in the light of the intellectual context of the English Civil Wars and in

Paolo Sarpi's monument in Venice. He was one of the major cultural-political actors of a time of confessional tensions that deeply affected the scientific culture of Venice and Padua.

the framework of the political, cultural, and religious relations that linked England and Venice at the beginning of the seventeenth century. These relationships also involve the Interdict crisis and the main protagonist of the Interdict's debate: Paolo Sarpi. The direct influence of some of Sarpi's ideas on Hobbes's political and theological-political thought is particularly attested to by the criticism that both authors addressed to Cardinal Robert Bellarmine and his theory of *potestas indirecta*. Their criticism can only be understood in the light of the previous debate on the problem of sovereignty, following the secular quarrel between temporal and spiritual power; a quarrel rooted in the political thought of the Middle Ages.

The second major area of cultural politics concerns the secularism of Padua's university teaching and its wider ramifications within Europe. Omodeo investigates how these expanding controversies between secular power and religious authorities reshaped Scholastic teaching and created a context in which decidedly a-Christian philosophical and cosmological theses could be taught and circulated. In a time in which Padua constituted an international hub of learning for students from all over Europe—including those from Protestant provinces and Orthodox countries—it was important for the University and Venice to remain autonomous from counter-Reformist confessional restrictions upon academic tolerance. The "*perpetuus promotor nationis Germanicae*" [perpetual advocate of the German nation], Cesare Cremonini, defended this principle of tolerance and attacked the Jesuit model of orthodox education by teaching Aristotelian philosophy according to an a-religious interpretation. In 1590, institutional opposition between the public university of Padua and the newly opened Jesuit college was intensifying and tensions between the students of the two competing universities were escalating. Cremonini, who had just been appointed as a professor of philosophy, defended the interests of the University in a famous oration that he gave in 1591 in front of the Doge and the Venetian Senators. Cremonini presented the institutional conflict as a political issue that would cast the suzerainty of the Republic into doubt. Following the university's complaint—and Cremonini's peroration of the cause—the Senate called for the suppression of the *Gymnasium Patavinum Societatis Jesu* [Padua University of the Jesuit Society], which constituted an illegal competitor to the University of Padua. In the context of mounting educational and political conflicts that opposed public universities to Jesuit educational endeavors, Cremonini came to occupy a crucial symbolic place comparable to that of Étienne Pasquier, who delivered his famous *Plaidoyé de l'Université de Paris, encontre les Iesuites* [*Plea for the University of Paris against the Jesuits*] in Paris

in 1564. In their campaigns in defense of their universities, both Pasquier and Cremonini emphasized the political relevance of their institutions: the University of Padua for the Republic of Venice and the University of Paris for the French crown. It is in this context of institutional and cultural tensions that Cremonini developed a radically a-Christian interpretation of cosmology, in agreement with the principles of Aristotle. He drew the most radical implications from the postulate of the eternity of the cosmos: the absence of a Creator, and the denial of God's will and providence in the world. Such views can be seen as the cultural expression of the autonomy of university culture from theology in accordance with the program of its institutional autonomy from the Church.

Main outputs

PUBLICATION	Gregorio Baldin, "Filosofie della sovranità, Sarpi e Hobbes eredi di Bodin," in *Giornale Critico della Filosofia Italiana*, XCVIII, 1 (2019) 55-74.
SYMPOSIUM COMMUNICATION	Pietro Daniel Omodeo, "Cesare Cremonini on the Heavens: Ontological Problems of Preclassical Celestial Physics," in the Bucharest-Princeton Seminar in Early Modern Philosophy (Bran, Romania, 24-28 June 2019).

Parisian Cross Roads

H3.2

Clashing Epistemic Cultures: Pierre Gassendi vs. Jean Baptiste Morin on Physics and Cosmology

Focusing on the polemics between Pierre Gassendi (1592–1655) and Jean Baptiste Morin (1583–1656), this research offers a case study on the formation of, and clash between, competing cosmological "epistemic cultures" in Catholic Europe in the aftermath of the condemnation of Copernicanism (1616) and of the Galileo Affair (1633).

The polemic followed the publication of the first of Gassendi's letters *De motu impresso a motore translato* in 1642. Gassendi's letter, which contained a defense of the Galilean theory of motion as well as

an attempt to systematize it, constituted an endorsement, albeit implicit, of Copernicanism. As proof of this, Gassendi ambiguously included the account of the first performance, by his own hand, of the Galilean mental experiment of the fall of the body from the mast of a moving ship. Galileo had put forward this experiment as proof of the possibility that the earth could move without devastating consequences for the bodies it carries, as asserted (in the wake of Ptolemy) by Simplicio in the *Dialogo*, the objects on its surface. Morin—who had brought forward the project of providing a comprehensive renewal of astronomy with a fierce defense of geocentrism—immediately understood the implications of Gassendi's defense of Galilean relativity. The that his response—followed by other polemical writings—triggered, involved the statute of astrology, of Copernicanism, Galilean physics, Epicureanism, and the relationship between theology and cosmology.

Rodolfo Garau reconstructs this polemic as an illuminating example of the clash between Geocentric astrology and Copernican (or crypto-Copernican) cosmology in early modern France. Garau analyzes the content, form, socio-political, and institutional aspects of the debate between Gassendi and Morin, paying particular attention to the intellectual networks

Portraits of the two opponents in the Paris controversy over post-Copernican astronomy, Galilean physics, and the legitimacy of astrology.

implicated in, and generated by, them, and to the attempts to hegemonize the cosmological and scientific debate within the institutional context of the Collège Royal.

Main outputs

CONFERENCE PRESENTATION	Rodolfo Garau: "The Polemic between Pierre Gassendi and Jean Baptiste Morin on Galileism, Copernicanism, and Galileian Astrology" in Annual meeting of the History of Science Society, Panel "As Above, So Below: Astrology, Comets, Volcanoes and Earthquakes in Medieval and Early Modern Europe". Utrecht (NL), 27 July 2019, July 27.

H3.3

Marin Mersenne: A Harmonist at the Heart of the Scientific Revolution

This research project investigates the ways in which the Minim friar and universal scholar Marin Mersenne (1588–1648), in his *Harmonie universelle* (1636) but also in his earlier works, attempted to bring all musical knowledge in line with the new cosmology and mechanical philosophy of the seventeenth century. Mersenne's thought on harmony and music, which is scattered throughout a number of his most important books, was the focus of many of his most enduring cosmological, natural philosophical, metaphysical, and ethical concerns. In this project, I begin by asking why Mersenne worked to defend his faith through his scientific endeavors while other seventeenth-century philosophers who engaged with mechanical philosophy eliminated the necessity of God and religion from their epistemological investigations. Second, I examine how Mersenne's skepticism, which urged him to divorce the acoustic properties of music from its metaphysical qualities, opened the door to new theories about the harmonic structure of the world, musical perception, and the relationship between music, knowledge, and language.

As with the other great men of science of the seventeenth century, the heritage of classical, medieval, and Renaissance science and thought served as the foundation for Mersenne's innovations. Against the rapid changes in the prevailing worldviews of his time, he creatively elaborated the idea that the cosmos, as an ordered model of the Good, could serve as a guide to a better life. Indeed, many ancient Greek philosophers,

medieval Christian theologians and philosophers, and Renaissance humanists believed that questions concerning the meaning of life and the structure and operations of the cosmos were close intertwined. However, in the face of the rapid developments in the cosmology and science of his time, it became increasingly difficult for Mersenne to link them to human ethics and music's role in human life. By investigating Mersenne's critical attitude to his sources, this project will contribute to a better understanding of the ways in which ancient, medieval, and Renaissance legacies affected the formation of seventeenth-century conceptions of the connection between the cosmos, man, knowledge, and music. This contribution is significant because many leading scholars in the field of the history of philosophy and science still deny the importance of this impact and often frame the thought of seventeenth-century philosophers in terms of a radical break with the humanist past.

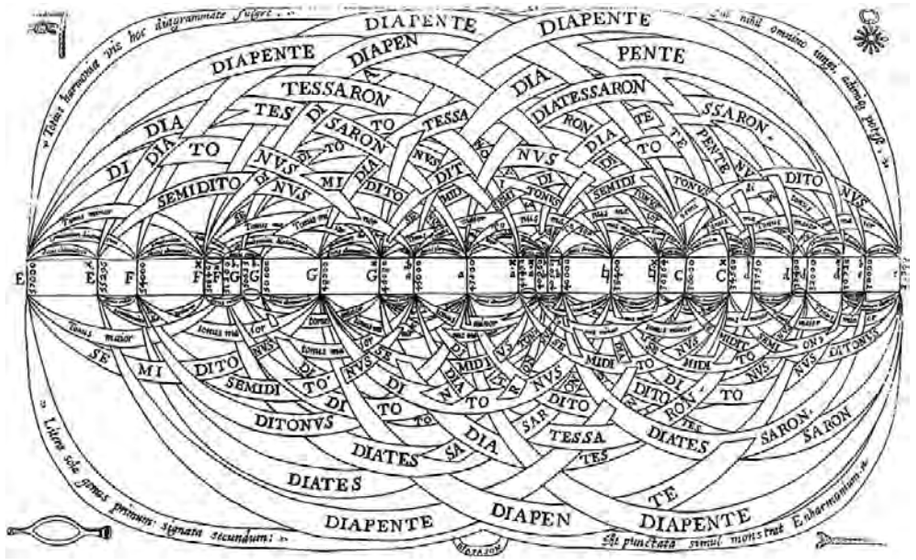
Main outputs

PUBLICATION	Jacomien Prins, "'Not for Irrational Pleasure': Music in Marsilio Ficino's *Timaeus* Commentary," in Jacomien Prins and Edmund Thomas (eds.), *Plato's Timaeus and the Foundations of Medieval and Renaissance Thought: Philosophy, Science and Art*, Leiden: Brill (2021, in press).
SYMPOSIUM COMMUNICATION	Jacomien Prins, "Marin Mersenne's Reception of Humanist Theories of Music and the Soul" in the conference *Classical Reception in Philosophy of Music* (Durham University, UK, 11-12 July 2019).

H3.4

The World in a Nutshell: The Legacy of Renaissance Philosophy at the Jardin des Plantes

Fornasier studies the network of correspondences between macrocosm and microcosm which was a fundamental interpretative pattern of the world for Renaissance intellectuals. This was particularly true in the case of medicine. Renaissance physicians were astrologers, astronomers, botanists, geologists, alchemists, and chemists, because their object of study, the human body, was the fulcrum of the network of connections in the world. Studying the world as a whole, those physicians, in most cases,

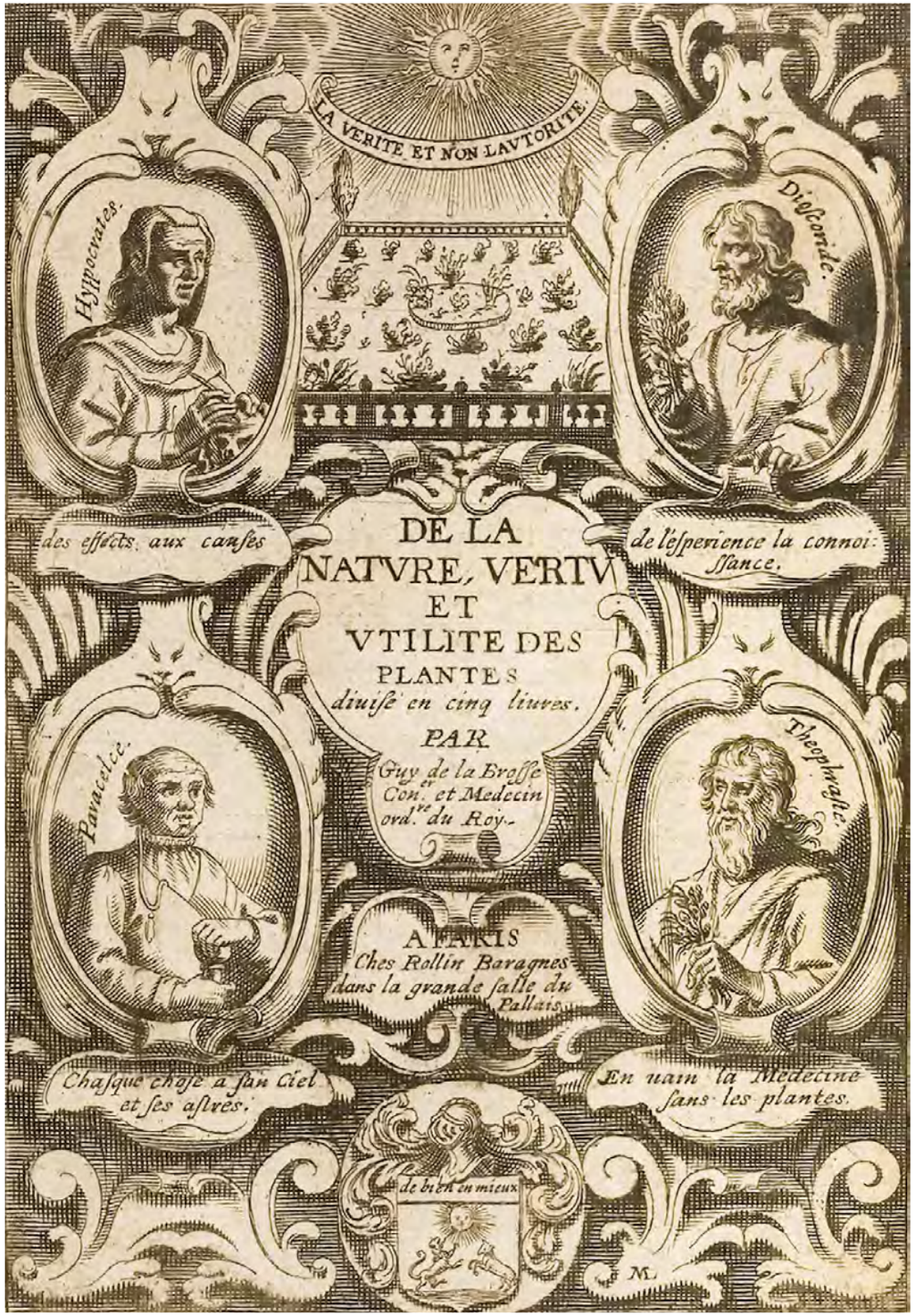


Musical diagram from Mersenne's *Harmonie universelle*, 1636.

tended to build their own philosophy, and therefore the analysis of the history of medicine and botany is deeply connected with philosophy.

The *Jardin du Roy* of Paris is a perfect example of how different kinds of knowledge converge in the area of medicine: in this huge research centre, botany (infused with many echoes of Renaissance sensualism) and chemistry (developed from ancient alchemy) were combined to make medical knowledge more efficient. Furthermore, this case study explicitly shows how knowledge is produced in close contact with political power and how the traditional, humanistic, and scholastic medical tradition lost power as the influence of its long-time ally, the Parliament, waned and the waxing absolute monarchy of the king decided to support a more natural way of practicing medicine.

The *Jardin du Roy* (later *Jardin des Plantes*) was the most recent and the biggest botanical garden in Europe. It was conceived by one of the King's physicians, Guy de la Brosse, who was also a botanist and a Paracelsian chemist. De la Brosse laid the theoretical foundations of his project with his text about the importance of plants in medicine: it is a book full of Renaissance sensism and Paracelsian iatrochemistry. In his analysis of the philosophy behind the *Jardin des Plantes*, he highlights the ideas from Renaissance philosophy that inspired this most revolutionary



Frontispiece of Guy de la Brosse's botanic work, *De la nature, vertu et utilité des plantes*, 1628.

innovation of the medical community in early modern France. The *Jardin* represents a school of Paracelsian iatrochemistry in the very heart of Paris. The study of the human body and plants was more related to dissections than to the books of Galen or Hippocrates. The form was just as innovative as the content, as many public lessons were organised in French, not in Latin. Moreover, the role of political power in this debate is central: the king's decision to gather physicians under his protection was part of the crown's wider plan to centralize power. This is part of a much broader and crucial early modern process of the institutionalization of knowledge centralized around the crown (and later the state), such as the *Academie des Sciences*. Fornasier covers, in detail, the debates between the Faculty of Medicine at the Sorbonne and the Parliament on the one hand, and the King and the "irregular" physicians (most of whom were Paracelsians) on the other. In time, the so-called *Maison médicale du Roy* increased in power and became a true medical competitor to the Sorbonne, an illuminating historical change that can be best understood through the example of the *Jardin du Roy*.

Main outputs

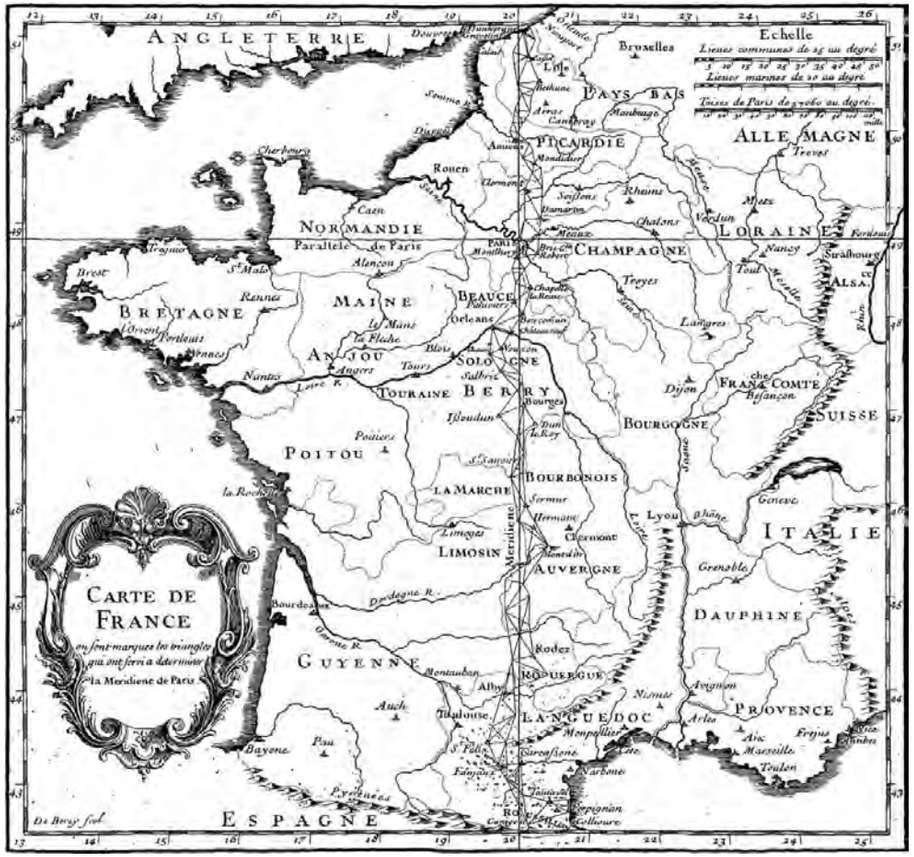
PHD THESIS	Matteo Fornasier works on these topics through his thesis on the cultural context of Guy de La Brosse's botanic philosophy.

H3.5

Global Scientific Practices of Terrestrial Measurement

The development of scientific practices in institutional settings is a central aspect of the formation of modern science. Marco Storni's research focuses on the seventeenth and eighteenth centuries, which was a period of time in which the scientist as a professional figure emerged as the result of the creation of a "closed community"—one that acknowledged specific forms of expertise and codified certain norms of communication. Politics significantly contributed to this process by creating and managing scientific institutions, in particular scientific academies. Therefore, Storni's research focuses on the Paris Academy of Sciences as an emblematic case study in the evolution of early modern scientific practices. The influence of political authority on science is clearly visible in this

example: one comes to understand how political interests shaped the agenda of scientific research, especially due to the demand for academicians to continuously justify the usefulness of their findings. The episode that Storni takes to be especially significant is the long-lasting debate on the shape of the Earth. In this debate, which was continued in the eighteenth century, one can see the intertwinement of, on the one hand, technical and practical discussions influenced by political concerns (the realization of a new map of France, the elaboration of more convenient navigation routes, etc.) and, on the other hand, cosmological arguments.



The mapping of the French territorial boundaries began in the seventeenth century after the establishment of the *Académie des sciences and the Observatoire*. These activities fueled cosmological debates about the shape of the Earth that opposed Cartesians and Newtonians. The image shows the measurement of a meridian arc joining Perpignan to Dunkirk, which was achieved between 1683 and 1713 under the direction of Gian Domenico Cassini.

The cosmological question discussed in the debate was whether Newton's theory of gravitational attraction—from which the picture of Earth as a flattened spheroid emerged—is correct. The alternative option was the elongated-Earth theory, which Cartesian natural philosophers had framed in the cosmology of vortices. The importance of these debates for the epoch-defining shifts in cosmological thinking cannot be understated. The success of the Newtonian idea involved a shift in the requirements of what it meant to be a good natural philosopher, a criterion which the Cartesians no longer satisfied. Therefore, this shift led to the exclusion of alternative models from the scientific community. Within this broader picture, Storni focuses upon the manuscripts of Yves Simonin, who was a navigator, hydrographer, and fierce critic of Newton (Archives of the Paris Academy of Sciences, Pochettes de séances, 1738–1740). However interesting Simonin's discussions of navigation charts might be, he is excluded from the academic debate because of his lack of mathematical knowledge, and the traditional cosmological views he endorses. Simonin's case also highlights the global dimension that early modern scientific practices began to assume. The local and amateurish nature of his research could not fit with the requirements of institutionalized science, which by the mid-eighteenth century was increasingly permeated by precise political and societal goals. In this sense, Simonin proves the rule through his exception to it; his approach had no place within the new scientific ideology.

Main outputs

PUBLICATION	Marco Storni, "Cartography, Geodesy, and the Heliocentric Theory: Yves Simonin's Unpublished Papers," in *Centaurus*, accepted, forthcoming.

H4 Applied Cosmology: Politics of Cosmography and the Environment

H4.1
Cross-Cultural Cosmography

The history of early modern cosmography attests to the indispensability of astronomical and cosmological knowledge for the solution of practical problems. In the age of the colonial expansion of the Iberian Kingdoms in the Americas, navigation and the mapping of the world required substantial astronomical knowledge. In particular, we have considered Vespucci's explorations, scientific achievements in astronomy and cartography, and legacy in order to illustrate the individual and collective vicissitudes that gave birth to our globalized modernity. In fact, the expansion of geographical knowledge corresponded to a reconfiguration of geopolitics. A planetary consciousness—which still constitutes an uncompleted task today—began to emerge in the fifteenth and sixteenth centuries as a consequence of cross-cultural encounters and clashes and because of the formation of the first 'planetary Empire'—that of Charles V, on which "the sun never set."

We are particularly interested in the ways in which the cosmology-based and practice-oriented discipline of cartography resulted from the encounters between Europe and the Americas. Nydia Pineda works on the circulation of astronomical images between the new world and Europe. In traditional historiographies of science, astronomical images are frequently understood as illustrations subordinated to textual descriptions or data, or, at best, as visual media that carry information and evidence. However, Pineda's study shows that graphic representations of the heavens acquire different political implications as they move across space and time. Through her surveys of manuscript and printed works that belonged to private and public libraries in former New Spain, now Mexico, Pineda seeks to discover how readers and collectors of European celestial images understood these representations through local conditions and agendas. Pineda's research is not merely concerned with the reception of images imported from Europe through different confessional and commercial networks: her project aims to unearth the complex material, epistemic, and political processes through which astronomical images were also produced in the Americas. Her work considers attitudes towards colonial and European instrumentation, creole and indigenous mapping practices, medical and antiquarian discussions of American skies and soil, and missionary politics. In this way, her research shows that celestial representations in the Americas were intrinsically linked to complex local economic, social, institutional, confessional, and material

Map by Lopo Homem, *Terra Brasilis*, included in the Miller Atlas, 1519.

processes, which cannot be reduced to a center-periphery model of knowledge production.

Silvina Vidal studies Giordano Bruno's meta-reflection on the colonial encounters. Bruno developed a harsh criticism of Spanish colonization in America. Although there are only few explicit references to this matter in his work, they play a major role in connecting cosmological, anthropological, and religious aspects of his universal reform. Bruno's anthropological defense of pre-Adamic polygenism (natural, plural, and independent generation of different human groups in diverse countries) runs, at a cosmological level, in parallel with the existence of a plurality of inhabited worlds, infinite homogeneous and autonomous planetary systems. From his cosmocentric and egalitarian viewpoint, Bruno argued that the Spanish domination in America could not be justified by religious, cultural, or economic superiority of any kind, but was instead associated with piracy, deceit, depredation, and brutal violence. These early-modern critiques call for new investigations of the societal, political, and economic reasons for the world expansion of the European powers, which began in the time of Columbus and Vespucci, and the

scientific knowledge that was mobilized for that enterprise. Furthermore, a great deal of scientific advance depended on the geographical novelties of the time, foremost in the areas of cartography and astronomy, but also in botany, medicine, and ethnography.

Main outputs

PUBLICATION	Pietro Omodeo, *Amerigo Vespucci: The Historical Context of His Explorations and Scientific Contribution*, ed. by Pietro Daniel Omodeo, Venice: Edizioni Ca' Foscari, 2020.
WORKSHOP COMMUNICATIONS IN VENICE	Silvina Paula Vidal, National Council of Scientific and Technological Research / Universidad Nacional de San Martín (Argentina), "Giordano Bruno's metaphor of the Spanish conquest as a 'swallowing whale'" (20 March 2019).
	Nydia Pineda de Ávila, Universidad Nacional Autonóma de México & Visiting Researcher at Ca' Foscari University, "The moon as a space of dispute: confessional and institutional agenda in lunar nomenclature in the seventeenth century" (20 November 2019).

H4.2

Early-Modern Environmental Management as Applied Cosmology

The environmental politics of early-modern Venice constitute a case study of the ways cosmological knowledge was mobilized for practical and political purposes in the past. The officers in charge of the management of the waters based their assessments on the state of the hydrogeological conditions: their interventions to protect the lagoon of Venice were based on broad natural and cosmological knowledge. Their comprehension of the complexity of their environment (both human and natural) included astronomical knowledge about the relative positions of the sun and the moon, theories about the attraction these heavenly bodies exerted on the waters, cosmological assumptions, and even astrological doctrines about the causes of sea tides and geographical expertise. Specific institutions created to manage the landscape and natural resources were the repositories of such knowledge. The most important among them was the *Magistrato alle acque*, the Magistrate for the Waters, who controlled and directed anthropic activity related to 'waters'. Our inquiry into Venetian archival documents, manuscripts, and printed books on these

entangled issues is a promising source of comprehension of the practices and materiality of natural science.

During the sixteenth and seventeenth centuries, Venetians were particularly concerned about the lowering of the water level of the lagoon, which constituted a problem for transportation, fishing, and defence. Most experts looked at river diversion as the solution that enabled avoiding the filling of the lagoon with sediments. Contrary to these opinions, Galileo's pupil Benedetto Castelli fought for a 'Copernican revolution' in a way of looking at water management: he argued for the necessity of canalizing more river waters into the lagoon in order to augment the input of water and raise its levels. Together with other researchers, Omodeo has been reconstructing this controversy in order to reflect upon the tension between mathematical abstraction according to a Copernican-Galileian model of scientificity, as well as its claims of solving the problems of the physical world. From an epistemological viewpoint, they ask to what extent this model brought about a conflict between physico-mathematical abstraction (which resulted from the isolation of particular variables to yield a set of quantifiable data) against 'geological' concreteness (a form of comprehensive knowledge aimed to cope with systemic complexity). They also consider whether the two different approaches were rooted in different societal arrangements and corresponding scientific practices, resulting in different modes of abstraction in practice.

Early-modern geo-environmental practices, controversies, and conceptions of the interactions between humankind and nature were linked to an idea of geological agency that foreshadows present-day concerns about the connection between nature and culture and, at a disciplinary level, between the natural sciences and the humanities. These questions have become crucial in the wake of current debates on the epistemological and philosophical implications of the new periodization category of the 'Anthropocene' (referred to the humans-made world in geology and beyond). Anthropocene debates call for a reassessment of the world-transformative agency of the past. In particular, the merging of perspectives stemming from geo-history and human history lead to a reassessment of human agency going beyond the cultural (political, social, economic) and biological realms. In fact, the geological and planetary dimension of human action cannot be neglected anymore. According to the new perspective, the Earth system is not the neutral background of human history, and instead constitutes the entangled result of human-natural coevolution. In consideration of the enlarged scope of collective activity mediated by technology and science, scholars in science studies have

A sixteenth-century diagram of the celestial influences producing sea tides by Sabbadino, who was the Officer of the Water Magistrate of Venice. From Sabbadino, *Studi sul flusso e riflusso del mare*, ca. 1557, Biblioteca Nazionale Marciana, manuscript It. IV, 51 (=5136).

gone so far as to challenge the idea that agency should be restricted to human practice, understood as embodied, materially mediated arrays of human activity involving knowledge as well as emotions. In spite of the novelty of these debates, the idea of geological agency has historical roots that are worth being investigated in the light of the concerns of the present. This line of inquiry is aimed at exploring early-modern geological agency as applied cosmology in both references: to humans as geological agents and to anthropomorphic visions of geological processes within their cosmological context.

Main outputs

SYMPOSIUM	Double session, organized by Tina Asmussen and Pietro Daniel Omodeo: "Early Modern Geological Agency" Annual conference of the International Commission on the History of Geological Sciences (INHIGEO) (Mexico City, 12-17 November 2018).
AWARDS	FARE Grant 2019 of the Italian Ministry of University and Research as an integration of the ERC project, on "Positioned Cosmology in Early Modernity: The Geo-Praxis of Water-and-Land Management in Venice" (acronym: *EarlyGeoPraxis*) (GA: R184WNSTWH).

Frontispiece of Bacon, *Instauratio magna*, 1620, a symbol of the connection of knowledge and power.

Epistemology: A Reflection on Method

Our endeavor is supported by an epistemological reflection on science as a historical, political, and cultural phenomenon. In accordance with the perspective of *historical epistemology*, we argue that episteme—which was referred to as a universal and a-temporal realm in antiquity and early-modernity—can no longer be seen as transcending history. A thoughtful historian of science knows that scientific validity (concerning the methods, ideals, and worldviews of science) is not independent of its genesis. Validity emerges from the elaboration of premises that are often implicit or a potentiality at the beginning of a process of research and knowledge acquisition. This is why we can speak of dynamic (or historical) a prioris of science. History shows that there is a path-dependency of science connected with its material and cultural roots and the conditions of its development—which we refer to in this project as the *institutions* and *metaphysics* of science. In addition, the view of the historian of science is guided by specific theoretical assumptions. Hence, there is a mutual dependency between the history of science and epistemology, a historical-epistemological spiral that fuels our progressive understanding of science while science itself historically advances. In fact, we claim no understanding is neutral (or simply descriptive) but is always related to ideals. Therefore, historical epistemology (a *historicizing* philosophy of science and a *philosophizing* history of science) implies forms of theoretical commitment which we seek to outline, understand, and interrogate.

Although we are convinced that ethical and political questions have always been a part of historical epistemology, it is a dimension of knowledge that has not been fully reflected upon. Today, these issues are particularly pressing vis-à-vis the deep crisis of public and intellectual trust in science. This occurs in spite of science's continuous successes and its fundamental function for the production and reproduction of the very conditions of existence of our *global knowledge society*. Such a crisis has received various names: it has been seen as a symptom of our post-modern condition, the post-truth predicament, a result of mounting relativism, populism, propaganda, and so on. Historical epistemology calls for an informed assumption of responsibility in relation to the many unresolved issues of the scientific-technological world we live in. These issues are political and ethical as well as theoretical and historical.

This set of problems entailed by historical epistemology find their realization through a fully-fledged program of *political epistemology*. It provides the theoretical framework for our engagement with the history of science. Our investigations into the cultural politics of science have inevitably led us to reflect upon and develop a methodology that can appropriately account for the ideological embedment of science in its ever-changing

social contexts. Our perspective brings together the philosophy, the sociology, and the history of science as three interconnected disciplines that work towards the same cultural goal of achieving a better understanding of science. In particular, we see history as a tool for the conceptual analysis and criticism of science. The reverse is also true: philosophical theory raises the questions that lead our historical investigation. To repeat, our path from historical to political epistemology is concerned with the three entangled dimensions of the 'genesis', the 'validity', and the 'orientation' of science. The third dimension, orientation, concerns normativity, ethics, and politics. In particular, we wish to highlight the question of the agency that *orientates* and redirects science as fundamental. This leads to an advance upon the more traditional historical and philosophical problems of the genesis (the origin and development) and the validity (legitimacy, categories, argumentative strategies, styles) of scientific knowledge.

Historical *political* epistemology establishes the foundation for a more general understanding of the ideological and political conditions of scientific practice in the past and the present. In this perspective, all meta-discourses on science (historical, historiographical, sociological, and philosophical) need to be critically reflected upon in terms of a critique of ideology. Omodeo's book *Political Epistemology* (2019) lays the groundwork for the assessment of the ideological struggles looming large over science studies in segments of the twentieth century and today. Moreover, it establishes the framework for an inquiry into the ideological dimensions of past and present scientific culture, and also provides specific guidance for the investigation into early modern scientific hegemonies undertaken by the ERC-*EarlyModernCosmology*.

In this section our enquiry is separated into two areas:

1 **Epistemology, Sociology, and Historiography of Early Modern Science:** This section proposes overarching reconstructions of the a *prioris* of early-modern practices and theories of science: ontological, epistemological, and socio-political. It also forms a bridge between an epistemological history of science and a historicizing theory of science by looking at social and culturalist approaches to our scientific modernity, in which concepts such as 'scientific revolution' and 'astronomical revolution' played a major role;

2 **Perspectives on Political Epistemology** is the political-epistemological culmination of the project: it distills the theoretical consequences of the various inquiries and it articulates the leading questions for a political epistemology of early modern cosmology.

E1 Epistemology, Sociology, and Historiography of Early Modern Science

E1.1

Contingency and Natural Order in Early Modern Science

This line of inquiry looks at the epistemological and ontological premises of early modern science and philosophy, including the actors' reflections on method and advancement of knowledge. We investigate the presence and meaning of modal categories for late-medieval and early-modern forms of scientific thought, in particular the problem of contingency. This constituted a crucial theme for an investigation of the historical epistemology of early modern scientific thought. Our reconstruction focuses on the transformation of the notion of contingency from an ontological doctrine to an epistemological viewpoint. It examines the period of late-medieval scientific practices and approaches to nature, up to the rise of early modern science, and questions its apparent univocity. We explore the ontological and epistemological shifts and their associated consequences brought about by this fundamental transformation of the philosophical premises of science. Over the course of the sixteenth and seventeenth centuries, the rise of mechanism, experimental practice, new instruments of observation and measurement, along with the growing application of mathematical heuristics to the study of nature challenged traditional ways of understanding the predictability and unpredictability of natural phenomena. The unpredictability or apparent irregularity of

natural phenomena prompted critical reflection upon the limit of the human ability to find comprehensive causal explanations, or, to reach a full understanding of the necessary causal concatenation determining each and every natural phenomenon.

In this research area, Pietro Daniel Omodeo and Rodolfo Garau coordinate a group of scholars working on the epistemology and ontology of contingency and the problem of natural order for a book project. Together, they have explored case studies spanning from the Middle Ages to the early eighteenth century including: the philosophy of necessity and contingency in Medieval philosophy, Aristotelian Scholastic natural theories of natural wonders, the heuristic of contingency in Renaissance mechanics and the arts, Copernican astronomy, and the idea of inclination without necessitation in astrology. Figures such as Bacon, Descartes, Leibniz, as well as the experimental practices of the Royal Society, provide evidence of the *epistemological* turn that progressively marginalized the 'ontology' of contingency. The group has also being investigating the inception of probabilistic and statistical methodology in early eighteenth century medicine and experimental physics has been surveyed.

Main outputs

PUBLICATION	Pietro Daniel Omodeo, Rodolfo Garau (eds.), *Contingency and Natural Order in Early Modern Science*, Boston: Springer, 2019.
WORKSHOP IN VENICE	Doina-Cristina Rusu, University of Groningen and Visiting Scholar at Ca' Foscari, "Cosmology and Redemption in Anne Conway's Metaphysics" (22 Novembre 2018).

E1.2

Political Epistemology of Early Modern Science and Philosophy

This line of research looks at the political roots and consequences of early modern knowledge theories. Early modernity was a time of intense debates over the statute of the sciences, their metaphysical and epistemological foundations, and their roots and goals. While Francis Bacon stands out for his practice-oriented ideal of science, Descartes offered the canonical codification of the modern problem of epistemology as the crucial problem of philosophy. The classics of modern philosophy bear witness

to problems of codification of a scientific enterprise that, in the time of the Scientific Revolution, challenged old interpretations and called for a renewed understanding of knowledge, its methods, and values. We specifically look at tensions and dissynchronies between forms of philosophical legitimation and the societal processes that pushed science forward. The Cartesian appeal to God and the immortality of the soul as the two tenets informing a novel foundation of philosophy could be perceived as both a philosophical incursion into the realm of theology or, vice versa, a repetition (albeit in a new guise) of the medieval concept of philosophy as the *ancilla theologiae*. Moreover, the attempts to make the philosophical premises of the natural sciences explicit were guided by political and cultural agendas at an individual as well as at a collective level. Therefore, we also have to closely look at the implicit epistemologies of the natural discourses in order to understand their function. While such ideological constructions enabled the comprehension of the sciences at a higher level of speculation, they mostly obscured their social and economic roots, as can be evinced by the vagaries of the idea of scientific usefulness ranging from the emphasis on spiritual elevation, the importance of application (as in Bacon), or on the practical origins of knowledge in general (as for Pierre de la Ramée). Further, they redirected the sciences towards new goals, either at the level of a justification of certain social settings or at the level of the transformation of nature.

The history of early modern mechanics, including the emergence of celestial mechanics, is a paradigmatic field of political epistemology. In fact, the history of mechanics has been at the center of many political-epistemological skirmishes, such as the harsh Cold-War ideological conflicts between externalist and internalist approaches to the history of science. On the one hand, socialist historians looked at the socio-economic roots of science, mediated by technology—in the case of mechanics, 'machine technology'. On the other hand, liberal intellectuals limited the scope of their investigation to the *spiritual* dimension of science by focusing on the so-called *internal factors* of scientific advance: theory, argumentation, method. In some cases, they looked at the connections between science, philosophy, and general worldviews, but obliterated the materiality present in these connections. After the *cultural turn* of the Eighties more attention has been given to micro-history, the actors and their intentions, while the vision of science as a cultural practice has been established. Building upon these scholarly paradigms, our political inquiry into early modern science aims at interpreting scientific practices in collective not individual terms. We also reevaluate the material dimension

Frontispiece of Galileo's most controversial *Dialogo sopra I due massimi sistemi del mondo*, 1632, which led to his condemnation by the Church. It portrays early modern scientists questioning the solidity of well-established forms of knowledge.

of scientific history because it has often been obliterated by culturalist approaches. In this way, our endeavor benefits from the approaches of the past and integrates them into a non-reductionist comprehension of the development of scientific knowledge as part of a broader social and political history.

Main outputs

SYMPOSIUM	Panel organized by Pietro Daniel Omodeo (double session) at the 8th conference of the *European Society for the History of Science* in conjunction with the *British Society for the History of Science* (London, 14-17 September 2018): "Towards a Curriculum of Political Epistemology: Theory and Case Studies," with the talk: "Cultural Politics of Cosmology in Europe in the Early Modernity."
WORKSHOP IN VENICE	Senthil Babu (IF Pondicherry & Visiting Ca' Foscari Venice) and Roy Wagner (ETH Zürich), "Political Economy of Computational Work in History: The case of the Vernacular Math Traditions in India" (29 March 2019).

E1.3

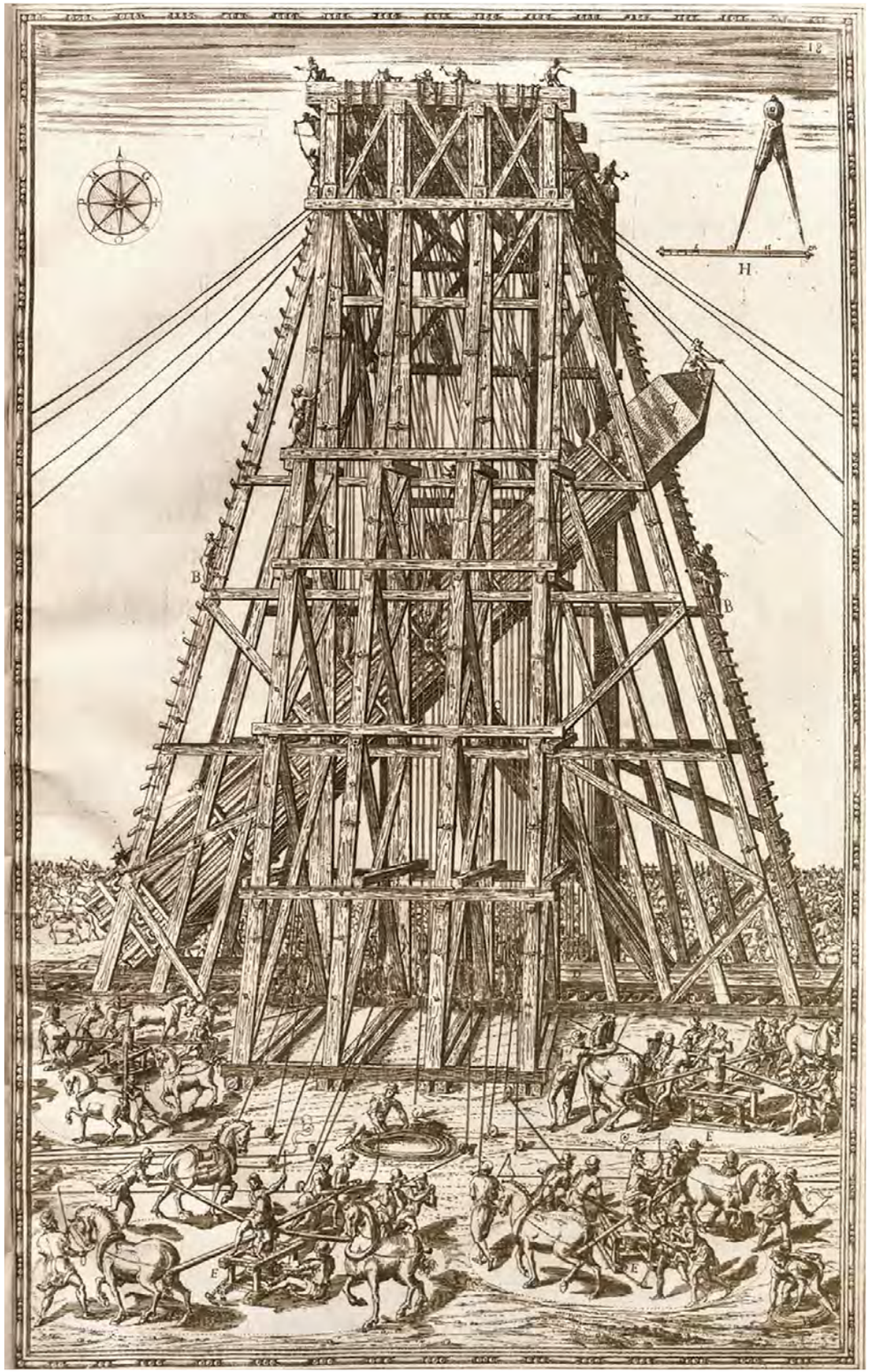
Socio-Epistemology of the Scientific Revolution

The 'Scientific Revolution' was one of the central concepts in the history of science during most of the twentieth century. Its central idea is that a unique break in intellectual history generated modern science—or science *tout court*. Historians and philosophers of science have long debated the exact geo-historical coordinates of such an event, including which disciplines were involved in it and which material and intellectual causes produced this cultural change. In general, historians of the Scientific Revolution have assumed that it must have taken place in early-modern Europe during the two or more centuries that culminated in the works of figures such as Leonardo da Vinci, Nicolaus Copernicus, Galileo Galilei, and Isaac Newton. Intellectual historians such as Alexandre Koyré regarded the Scientific Revolution as a *spiritual* achievement—one that was both philosophical and theoretical—whereas historical materialists such as Boris Hessen and Edgar Zilsel sought the socio-economic roots of the new attitude towards nature and argued for its connection with the rise of capitalism. In addition, they discussed whether 'theoretical'

astronomy and cosmology played the fundamental role or whether it was instead 'practice-oriented' mechanics that ignited the modern path to science. The philosopher of science Thomas Kuhn generalized the discontinuist interpretation of modern science. He viewed examples such as the 'Copernican Revolution' in planetary astronomy and the breakthrough of Newtonian physics as paradigms that reveal the invariant structure of scientific advance.

Within the Kuhnian conception, there is an inherent bias towards pluralizing relativism—according to which there is no reliable measure to ascertain the relative superiority of different paradigms and theories—that was magnified in the Eighties as a consequence of the so-called 'cultural turn'. In recent years it has become even more pronounced in new approaches to science, technology, and society. Indeed, at the present juncture the very idea of the Scientific Revolution has been questioned for reasons that range from post-colonial allegations of Eurocentrism, the social-constructivist criticism of truth-claims, and the post-modern suspicion towards the concept of modernity. Given the present crisis of the 'narrative' of the Scientific Revolution, it is time to assess whether it should be dismissed all together or whether some results of past scholarship can still be rescued.

We claim that such an assessment will *only* be possible if the political meaning of the Scientific Revolution is taken into account. It would be reductive to consider the Scientific Revolution as a historiographical construct without taking into account the reality it refers to and the contexts it arose out of, namely the phase of European scientific and political hegemony which was previously described by the interconnected concepts of science and modernity. Therefore, the problematic of the Scientific Revolution should be seen as both an historiographical as well an historical one. In both dimensions, it refers to a problem of science and power. The first aim of this line of research is to reconstruct the socio-historical and epistemological dimensions of the concept of the Scientific Revolution, including those of the Astronomical Revolution. In addition, we aim to highlight the relationship between the ideological implication of these debates and the institutionalization process of the disciplines that deal with science at a meta-level: the history of science, epistemology, and the sociology of science.



Right: The collective, technical, scientific and physical effort to erect the Vatican obelisk was a synthesis of the practical roots of early modern science as a collective endeavor. Image from Fontana, *Della transportation dell'obelisco vaticano*, 1590.

Furthermore, we propose a new interpretation of the Scientific Revolution as a consequence of the synchronization of different social temporalities in early modern society. The emergence of modern science has been interpreted in social terms in various ways as the result of social, economic, ideological, cultural, and political conflicts. Different regional latent crises and social changes in various relatively autonomous fields (e.g. the religious, political, economic, artistic-artisanal, and so on) influenced scientific practices by determining the emergence of a new form of knowledge: *modern* science. We analyze how local social temporalities inherent to various social fields extended their specific crises to other regions of social space, generating a synchronization able to bring about a *coincidence of events*, that is to say, a 'revolution'. This entanglement of multiple temporalities creates an effect of general *acceleration* in the social space, which allows us to identify the Scientific Revolution as a unitary *historical event*. At the descriptive level, this process of synchronization is not necessarily organized as a unified, causal series of events, like the *après coup* reconstruction of the historian's chronology. The objective here is to analyze the position of different fields—and the behavior of the corresponding agents—in the *scientific revolution*, and relate this to the social time-scale resulting in the entanglement of the rhythms of each part of the social world.

Ultimately, such an approach enables the construction of an analysis that integrates the *political economy of knowledge* and *cultural politics of science*. We are therefore able to overcome several false oppositions present in historiography and history writing, including between the longue durée and micro-historical levels of analysis; historical descriptions of continuity and discontinuity; internal/external analyses of scientific development; micro/macro sociological factors; and finally, the prejudicial opposition between high/low culture which has, for a long time, prevented the writing of a history of science from below.

Main outputs

PUBLICATION	Pietro Daniel Omodeo, "Scientific Revolution, Ideologies of the," in *Encyclopedia of Early Modern Philosophy and the Sciences*, ed. by Dana Jalobeanu and Charles T. Wolfe, Dordrecht: Springer Online, 2020, 1-10.
WORKSHOP IN VENICE	Sascha Freyberg, Pietro Omodeo and Giulia Rispoli (Max Planck Institute for the History of Science, Berlin), with the participation of Gerardo Ienna, "Boris Hessen's textbook on Classical Physics in the context of early Soviet approaches to historical epistemology" (6 March 2019).

E1.4

Cosmology and Culture: From Historical to Political Epistemology in Cassirer and Wind

In his project "Cosmos and Culture", Freyberg analyses the relation between cosmological models and methodology, as well the relation between political and epistemological problems. In particular, he reconstructs a discussion between Ernst Cassirer and his former student Edgar Wind about the basis of ethico-political attitudes and their general cultural consequences. The discussion took place in Weimar Germany at a time in which the influence of neo-Kantianism was waning. Both thinkers emphasized points of contact and parallels between the natural and the historical (or cultural) sciences, but they differed in their respective evaluations of the consequences of such similarities, both in regards to a philosophical approach and for a theory of symbols and culture more generally. Do these similarities only exist on a very general level (e.g., the concept of science or scientificity) or do they signify a more concrete relation between cosmological research and cultural understanding (micro- and macrocosmos, nature and society)? While Cassirer tried to integrate the classical Kantian primacy of ethics, the historical epistemology of modern science, and the philosophy of culture within a pluralist and perspectivist approach, Wind took a more radical stance. In his *Experiment and Metaphysics* (1934/2001) he set out to challenge Kant's clear-cut separation between the realms of necessity and freedom and the status of practical philosophy. Since Kant based his critical conceptions on Newton's system of physics, the changes in the presuppositions behind this physical system wrought changes upon the philosophical whole, especially with regard to the relation of theoretical and practical knowledge. Wind believed that a thorough revision of Kant's work was needed in light of new cosmological models. The ground-breaking developments in physics (on micro- and macro-cosmological levels) in the beginning of the twentieth century, such as the theory of relativity and quantum mechanics, not only challenged the Newtonian approach but also brought about basic epistemological disputes about causality and the entanglement of the research process and its objects. Regarding this latter aspect, Wind emphasized that the so-called observer effect in quantum mechanics resembles what in the humanities is called the hermeneutic circle. The necessary involvement of the observer in the research process, something which had to be negated or downplayed in positivism, also lent uncertainty a systematic role. The relation between the different

realms could not be deduced anymore, since the new cosmology was by definition ongoing and open-ended. Pointing to the notion of the experiment as a gap in Kant's system, Wind stressed that even though the relation is complex, there are political consequences to cosmological and epistemological presuppositions (and vice versa). For example, the strict separation of freedom and necessity, and of fact and value, can lead to a condition of non-commitment (*Unverbindlichkeit*), which endangers the very presuppositions of the freedom of science. In the end, the dispute between Cassirer and Wind reveals a fascinating degree of differentiation beyond conventional dichotomies (like universalism vs. relativism, naturalism vs. idealism, science vs. belief, thought vs. feeling etc.) and should be seen as ultimately engaging with the question of the role of philosophy and science in society.

Main outputs

WORKSHOP IN VENICE	Cassirer scholars, organized by Sascha Freyberg, "Ernst Cassirer on Renaissance Thought" (18 October 2019).

E2 Perspectives on Political Epistemology

E2.1

Political Epistemology

This collective endeavor takes up the theoretical challenge of developing a political epistemology. The group has chosen themes and questions linked to ongoing debates in the history of science and allied disciplines about the importance of politics in and for science. The various contributions take the form of a theoretical-historical inquiry, that is, a "political *historical* epistemology" that programmatically keeps together the history of science, epistemological reflection, and sociological analysis.

The endeavor began in response to the limitations historians of science placed upon their analysis of the socio-political entanglements of knowledge, focusing mostly upon the 'contexts' while generally neglecting the self-reflective—and normative—import of history-writing itself. In political theory, knowledge politics has been treated in relation to truth practices only insofar as they concern our contemporary techno-scientific world and without consideration of the historical origin and path-dependency of knowledge advancement, as well as its structures and strategies. At the same time, the philosophy of science has generally reduced epistemological questions to questions of justification without sufficient consideration of the historicity of knowledge. We propose to overcome this methodological fragmentation and explore the politics of science as a unified socio-epistemological and historical endeavor, that is, as an articulation of historical epistemology.

The group specifically addresses the socio-political conditions and presuppositions of science with the goal of comprehending the broader societal meaning of epistemic *practices* and their consequences as forms

The logo of the "Politically Mathematics Collective" in India (www.politicallymath.in).

and results of collective activity. We consider the emergence of science from the historical terrain of human praxis, which brings together hand and mind within collective spaces of interaction. We view science as a mediation between the socio-economic sphere and the cultural-ideological: on the one hand, science secures the production and reproduction of societal formations; on the other, science has an ideological import insofar as it provides for ways to justify and criticize social order and helps reorient, transform and imagine alternative ways of living.

In accordance with these premises, we explore historical cases that illuminate the connection between science and politics and therefore can give rise to meta epistemological or philosophical reflections. These cases includes the following themes:

1 the political dimension of cognition as alienated (extracted, codified, abstracted, externalized) practical knowledge, investigated through the ways in which science historically reflects (mirrors, parallels, reinforces) social difference and power relations;
2 how political structures and ethos (in democratic republics, authoritarian states, court society etc.) inform science at the level of contents, epistemic values and methodologies (argumentation, demonstrative procedures, reasoning, styles of thought);
3 the political directedness of science as a contested field of ideological struggles for meaning.

Main outputs

PUBLICATION	Pietro Daniel Omodeo, *Political Epistemology: The Problem of Ideology in Science Studies*, Dordrecht: Springer, 2019.

E2.2

Science and Hegemony

This line of research aims to examine and assess how science has always been informed by values stemming from political and cultural agendas. We also explore new avenues through a reassessment of the leftist tradition in the field. This presents an opportunity to fully emphasize the manner in which science has mirrored power relations in the past and

Gramsci Monument by Thomas Hirschhorn, realized in New York in 2013.
Photo © Cameron Blaylock (Source: Urban Omnibus).

present through its practices, conceptions, justifications, institutions, cultural authority, patterns of circulation, and technocratic policies. The Gramscian concept of hegemony allows us to critically assess the political directedness of scientific and theoretical practices as well as to reflect on the status of the disciplines that deal with science at a meta-level (historical, socio-historical, and epistemological).

In spite of the longstanding perception of modern science as a value-free form of knowledge of the external world, the boundaries between a supposed ideology-free history of ideas and an ideology-loaded social history of science have been progressively blurred in the past few decades. Within this a cultural climate, criticisms of the autonomy and neutrality of modern science have more or less explicitly permeated the recent historiography of science. As a result, the profiles, responsibilities and commitments of academics, and especially of those involved in the natural sciences, have been dramatically realigned. The reflections of the political thinker Antonio Gramsci (1891–1937) are particularly relevant to these issues. In his *Prison Notebooks* of the 1920s and the 1930s, he provided scholars with an effective conceptual arsenal to critically grasp new interactions between science and society. In recent times, sociologists,

historians, and cultural theorists have decisively interiorized Gramscian concepts as effective means to analyze societal and cultural dynamics. But key notions such as "cultural hegemony," and the role of the "intellectuals" (scientists, experts, popularizers, educators, decision makers) in "civil society", when raised within the context of historiography of science, may help to articulate new approaches for understanding the relationship between science and society in a larger, historical dimension.

Omodeo, in collaboration with Massimiliano Badino, has been investigating, collecting, and editing case studies that illuminate the hegemonic position of science in the past and in the present, as well as the struggle for meaning in the sciences and science studies at large. Among the areas of inquiry, is the troubled cultural-political relation between science and religion where, unsurprisingly, the Jesuits feature prominently. Because of the nature of their mission their Order involved several Gramscian themes: Jesuits were intellectuals, religious men and educators, as well as, of course, cultural politicians. The exploitation of scientific authority to propagate a common understanding that consistently combined scientific and religious projects also permeates apologetic strands of modern Jesuit Studies, which can translate, at a sort of meta-level, the political objectives of their own subject matter.

Main outputs

PUBLICATION	Pietro Daniel Omodeo, Massimiliano Badino (eds.), *Cultural Hegemony in a Scientific World: Gramscian Concepts for the History of Science*, Leiden: Brill, 2020, forthcoming.

E2.3

Positioning, Gender and Race

The main purpose of this line of research is to reassess the most important themes of feminist epistemology as a specific contribution to political epistemology, as well as to analyze its emancipatory power for the philosophy of science in connection with post-colonial studies, subaltern studies, and STS. Feminist epistemology highlights the role of social, political, and normative aspects of knowledge production and exchange. Because it begins its analysis from the impact of the social conditions and the embodiment that lie behind the epistemic work of the 'knower',

it views the social-political contexts as 'problematic' (as we cannot really *escape* from their influence) but also 'resolutive' (my partiality gives me a particular glimpse of problems, which can be combined with other local perspectives to offer a more comprehensive understanding of a phenomenon). Putignano's aim is to evaluate feminist approaches to crucial questions, such as how to reach objectivity, the epistemological question of partisanship, how situated knowledge can have epistemically shared validity, the construction of scientific ideology and how it is carried out, and the ascertainment of the role of power in science and knowledge production in contemporary societies.

Francesca Putignano investigates the transversality and interdisciplinarity that feminist epistemology can provide in order to ascertain the potential inherent in this approach and whether it can be broadened. She focuses on the epistemic relevance of feminist epistemology in the debate on how scientific objectivity is secured. Scientific objectivity expresses the idea that the claims, methods, and outcomes of science are—or at least should—be free of particular perspectives, value commitments, and any personal biases of any kind. As it is, scientific objectivity represents both an ideal for inquiry and the ground on which the authority of science is justified. By contrast, feminist epistemology recognizes that knowledge is always *situated*, as the subject-knower is always concretely positioned, so it is crucial to consider the contexts since they modulate acquisition, reviews, and assessments. Knowledge is situated because it reflects the point of view of individuals or a group; consequently, the recognition of what we live and what we know is conditioned by our social experience. Hence, feminist epistemology studies the interconnections between epistemological and political aspects to reach a better, more holistic, and more coherent understanding of our scientific world.

Putignano particularly focuses on two different strands within feminist epistemology: contextual empiricism and standpoint theory. More precisely, contextual empiricism, as formulated by Helen Longino, provides the normative criteria that regulates knowledge production. On the other hand, standpoint theory (Sandra Harding) shows what occurs when marginalized groups enter and actively participate in the production of scientific content. According to Harding, beginning from the margins is essential for raising new scientific questions, critically revising old ones, and forming a more diversified scientific community, which is enriched with a new awareness of marginal life experience, which in turn assures less partial and less mystified knowledge. These formerly marginalized experiences can help science to understand the material

Poster image of a conference on feminist epistemologies held in the US in 2016.

world, human bodies, and social relations in ways that have usually been unavailable to academic communities mainly consisting of men, who have constructed epistemology, social theory, and conceptual frameworks of research from an implicitly gendered perspective. Ultimately, Putignano aims to construct a dynamic reinterpretation of objectivity, which considers the partiality of knowledge, without dooming it to arbitrariness and epistemic relativism. Rather than a source of dissonance, diversity of knowledge producers is an epistemic resource, and scientific knowledge should be seen as the result of a critical dialogue between individuals and groups that have diverse points of view and whose critical and interactive discussion is regulated by normative criteria, which can and should be critically evaluated.

Main outputs

SYMPOSIA	Francesca Putignano, "Feminist Epistemologies: Re-Conceptualize Objectivity" in The Irish Philosophical Society's 2019 Conference in Science, Politics and Philosophy, University College Cork (IR), 6-7 December 2019.
	Rodolfo Garau, "Quantifying the Criminal Mind" in International Conference The Quantification of Bodies. Coimbra (PT), 28 November 2019.
PHD THESIS	Francesca Putignano works on these topics through her thesis on feminist objectivity in the philosophy of science: a crossroad between politics and epistemology.

E2.4

Aesthetics of Epistemology: A Critical Theory of Scientific Culture

This project attempts to reactualize critical theory with the help of a case study applying political epistemology to the historical process of post-modernization. Political epistemology is understood as combining philosophy and sociology with geographical and political disciplines from an ideological-critical point of view in order to emphasize the historicity of the status quo for opening up horizons of autonomous praxis. One of the working hypotheses of this approach is that the institutional, political, and ideological settings of technological-economic paradigm shifts may be ideally deciphered in vanguard artistic manifestos.

Around the time of the historic avant-gardes and afterwards, the hegemonically structured collective standpoint on the world and, together with it, the practices mediating between the material and the cultural dimensions of society were in a process of profound transformation. Arguably, both transformations are the result of a changed and changing technological-economic reorganization of societal cohesion. This reorganization can be called a process of post-modernization that denotes a "collapse of culture into the economy" (Tafuri) which began in the beginning of and continued throughout the "short twentieth century" (Hobsbawm). This collapse, however, should not only be understood as a societal transformation towards mass consumption, mass communication and mass advertising in the course of which the cultural field became more and more colonized by economic imperatives (Habermas). Rather, within the same period, new cosmologies of becoming and transformation, of the fluid and the liquid (on the one hand), and of surface, appearance and relationality (on the other) emerged that are usually called post-dualist or post-modernist. This may be because, along with the technological-economic changes, the moral economy also changed: it moved from the Weberian Protestant work ethic and its associated liberal-bourgeois norms (autonomy, individuality, and history as progress) towards the new, post-dualist, elective affinities of former dichotomies. To put it in a nutshell, as Boltanski and Chiapello have it: managers became artists, and artists became managers.

Political epistemology, which concentrates on the entanglements of technology, economy, and ideology, seeks to analyze this "end of dualisms" which can first be traced in the historic avant-gardes, and especially in Dadaist manifestos and practices, as a societal collapse of culture in the economy that led to the emergence of a new form of economy: the

knowledge economy. Yet, for critical theory in the spirit of early Frankfurt School thinking, this development is not to be followed or mirrored uncritically, but must be analyzed, questioned, shown to be historically contingent, and thus transformable. In this vein, political epistemology can, by pointing out post-modernity's historicity on ideological-critical and praxeological terms, help to reactualize critical theory for the twenty-first century.

Aesthetics of Epistemology, which has two strands comprising Lukas Meisner's dissertation and Lindsay Parkhowell's research, critically assesses aesthetic issues such as representation, the politics of the historic avant-gardes, and the political relationship between artistic media and culture. Following on from his article on the politics and representational aesthetics of the atom bomb, which was co-authored with the Principal Investigator, Parkhowell is currently researching how the 'slow' and 'distant' violence of climate change disproportionally affects island communities—and what we can do about it. Broadly speaking, his research has strong ethical and collective aims and seeks to both advance and practice the thesis that art is pedagogical-democratic,

Turner's oil painting, *Rain, Steam and Speed, the Great Western Railway*, 19th century.

transformative, and socially redemptive. On the other hand, Meisner's project On Avant-gardes and Post-modern Epistemology attempts to reactualize critical theory with the help of a case study applying political epistemology to the historical process of post-modernization. One of the working hypotheses of this approach is that the institutional, political, and ideological settings of technological-economic paradigm shifts may be ideally deciphered in vanguard artistic manifestos. As such, Meisner analyzes the historic avant-gardes, and especially Dadaist manifestos and practices, in terms of a societal collapse of culture in the economy that led to the emergence of a new form of economy: the knowledge and the aesthetic economy. His ultimate aim goes in the two-fold direction of a) using political epistemology—which can point out post-modernity's historicity in ideological-critical and praxeological terms—to reactualize critical theory for the twenty-first century; and b) delivering political epistemology with a reactualized version of the Frankfurt School. The latter includes a re-theoretization of modernity/postmodernity, art/society, and culture/economy, rooting the methodology of a critique of ideology in a materialist critique of religion. Such a critique has its background in a radicalized enlightenment open norm of political autonomy, along whose line the concepts alienation, reification, and ideology can be updated—concepts which are of prime importance for political epistemology.

Main outputs

PUBLICATION	Pietro Daniel Omodeo, Lindsay Parkhowell, "Towards Another Sublime: Away from the Aesthetics of Destruction," in *Technology and the Sublime*, ed. by Giulia Rispoli and Christoph Rosol, journal special issue of *Azimuth. Philosophical Coordinates between Modern and Contemporary Age*, 12/2 (2018) 147-165.
PRE-DOC RESEARCH ACTIVITY	Lukas Meisner's PhD's research on "The Political-Epistemological Problem of Postmodernity from the Viewpoint of Critical Theory."

The cosmic thinker, Giordano Bruno: Alexander Polzin's statue in Potsdamer Platz, Berlin.

Group, Activities, Outcomes

The Group

Direction

Pietro Daniel Omodeo

Principal Investigator

Pietro is an historian of science and philosophy and a professor of the philosophy of science. His research focuses on science, philosophy, and literature in early modernity, as well as on historical epistemology. His work encompasses the ontological and epistemological premises of medieval and early-modern natural philosophy and science up to the rise of mechanical visions of the world. Moreover, he has investigated the history of cosmology and physics, in particular post-Copernican astronomy, mechanics, and physico-mathematics. His inquiry into the history of science expands upon the wide cultural interconnections of early scientific debates as well as upon their socio-institutional embedment. His work on historical epistemology focuses on political epistemology along Gramscian lines of investigation. It comprises a critical assessment of the agendas underlying the historiography of science.

Management

Silvia Bellacicco

Project Manager, 04/12/2017 — ongoing

Silvia is an expert in European funding and Euro-planning, as well as in project management and implementation. She holds a degree in Marine Environmental Sciences (2000) from the “Ca’ Foscari” Università di Venezia, and since 2001 she has worked on European funding for public bodies such as municipalities, research institutes/universities, as well as civil regions and private companies. She has extensive experience in project/partnership coordination and management, and in providing technical and financial assistance for the project leaders and associates.

Sascha Freyberg

Editorial Manager, 01/06/2018 — ongoing

Sascha is the editorial manager of the project responsible for its two book series Knowledge Hegemonies and Verum factum. He studied cultural sciences and philosophy in Hagen and Berlin and graduated with a Master Thesis on Ernst Cassirer’s critique of symbolic consciousness. Currently is finishing a PhD thesis on the relation of experiment and metaphysics in Edgar Wind’s epistemology at the Ruprecht Karls University Heidelberg.

Non-tenured Assistant Professors

Jacomien Prins

01/10/2018 — ongoing

Jacomien is a historian of philosophy and a historical musicologist. She joined the Ca' Foscari faculty as an assistant professor in 2018. She has worked extensively on the interaction between philosophy and music. Her published work includes *Echoes of an Invisible World: Marsilio Ficino and Francesco Patrizi on Cosmic Order and Music Theory* (Leiden: Brill, 2014), *Sing Aloud Harmonious Spheres: Renaissance Conceptions of Cosmic Harmony* (Abingdon: Routledge, 2017), *The Routledge Companion to Music, Mind, and Well-being* (Abingdon: Routledge, 2018), *Marsilio Ficino*: *Commentary on the Timaeus*, critical edition accompanied by an English translation (Cambridge, Ma: Harvard University Press), The I Tatti Renaissance Library (ITRL), 2 vols. (forthcoming), and *'A Well-tempered Life': Music, Health and Happiness in Renaissance Learning* (in preparation). She is currently working on a research project titled 'Marin Mersenne: A Harmonist at the Heart of the Scientific Revolution' and teaches courses in the history of philosophy, science and music, and philosophy of science.

H Darrel Rutkin

01/10/2018 — ongoing

Darrel is a historian of science and philosophy specializing in the history of medieval, Renaissance and early modern astrology, ca. 1250-1800. His work focuses on astrology's numerous relationships to science, theology and magic within their relevant conceptual, institutional, confessional, socio-political and cultural contexts over the longue durée. Among many other questions, he is concerned to establish astrology's centrality to the premodern Aristotelian-Ptolemaic understanding of nature ca. 1250-1600 both conceptually and institutionally. He then uses these structures—especially the patterns of their teaching at the finest premodern universities—to reveal the complex patterns of how astrology was marginalized and ultimately removed from the map of legitimate knowledge and practice during the Scientific Revolution and the Enlightenment. Among numerous other publications, he has recently completed volume I of his first monograph, *Sapientia Astrologica: Astrology, Magic and Natural Knowledge, ca. 1250-1800*, that has been published in the series, "Archimedes: New Studies in the History and Philosophy of Science and Technology," Jed Z. Buchwald (ed), Dordrecht: Springer, 3 vols. Volume I is entitled, "Medieval Structures (1250-1500): Conceptual, Institutional, Socio-Political, Religous and Cultural." He has also co-edited *Horoscopes and Public Spheres: Essays on the History of Astrology*, with Günther Oestmann and Kocku von Stuckrad (Berlin, 2005). Among his publications, he authored "How to Accurately Account for Astrology's Marginalization in the History of Science and Culture: The Essential Importance of an Interpretive Framework," in a special issue of Early Science and Medicine edited by Hiro Hirai and Rienk Vermij, 23 (2018): 217-43. He has also contributed to the Cambridge History of Science and the Harvard Companion to the Classical Tradition. His project in the framework of the ERC-*EarlyModernCosmology* group is the work on the second volume of *Sapientia Astrologica*.

Charles T. Wolfe

01/10/2019 — ongoing

Charles works primarily in history and philosophy of the early modern life sciences, with a particular interest in materialism and vitalism. He is the author of *Materialism: A Historico-Philosophical Introduction* (Springer, 2016), *La philosophie de la biologie: une histoire du vitalisme* (Classiques Garnier, 2019), and Lire le matérialisme (ENS Editions, 2020), and has edited volumes including *Monsters and Philosophy* (2005), *The Body as Object and Instrument of Knowledge* (2010, with O. Gal), *Vitalism and the scientific image in post-Enlightenment life-science* (2013, with S. Normandin), *Brain Theory* (2014), *Physique de l'esprit* (2018, w. J.C. Dupont), and *Philosophy of Biology before Biology* (2019, w. C. Bognon-Küss). Among his current projects are coedited volumes, one (with A. Clericuzio and P. Pecere) entitled *Mechanism, Life and Mind in Early Modern Natural Philosophy* and another (w. C. Donohue) entitled *Vitalism and the Contemporary Life Sciences*. He is co-editor of the book series 'History, Philosophy and Theory of the Life Sciences' (Springer). Within the framework of the ERC-*EarlyModernCosmology* project Charles is working on the theme "Life as concept and as science: A reconstruction of modern vitalism".

Post-doctoral Scholars

Rodolfo Garau

01/07/2018 — ongoing

Rodolfo is a historian of philosophy and of science. After his PhD (2015), he held post-doctoral positions at the Max Planck Institute for the History of Science in Berlin and at the Université du Quebéc à Trois-Rivières, and, as adjunct lecturer, at Bard College Berlin as well as at the University of Turin. His current research foci are: 1. the cross-use of concepts between physics, biology, and metaphysics in the early modern period, on which he is preparing a volume exploring the history of the concept of *conatus* ("endeavor") between late-Scholastic and modern science and philosophy, and 2. the critical investigation of the emergence of, and correlation between, modern race theories and criminology. The focus of his research project in the framework of the Early Modern Cosmology group is the physics, astronomy, and logic of Pierre Gassendi, of whom he is translating the *Syntagma philosophicum* (with Justin E. H. Smith) for Oxford University Press.

Gerardo Ienna

01/03/2020 — ongoing

Gerardo works at the boundary between historical epistemology, historiography of science and sociology of science. After his PhD (2019) at University of Bologna, he held a post-doctoral position at University of Verona and collaborated with the Free University of Bolzano. He also taught, as adjoint lecturer, Logic and Philosophy of science at the University of Verona. His current research foci are: 1. marxist historiography of science, 2. French historical epistemology, 3. historical sociology of science, 4. Science and technology studies. The focus of his research project in the framework of the Early Modern Cosmology group is the socio-historical-epistemology of scientific revolutions.

Marco Storni
01/04/2019 — 31/03/2020

Marco is a historian of science and philosophy, specializing in early modern epistemology, scientific practices, and the history of the exact sciences. After completing his PhD (2018) at the École Normale Supérieure of Paris and the University of Bologna (joint supervision), he has been graduate assistant at the University of Neuchâtel and Herzog-Ernst fellow at the Gotha Research Centre of Erfurt University. His current research interests include: 1. institutions and scientific practices in the early modern times; 2. early eighteenth century epistemological theories; 3. chemical and alchemical practices in the seventeenth century. His research project in the framework of the Early Modern Cosmology group deals with the cosmological and institutional stakes in the debate on the shape of the Earth (1672-1740).

Gregorio Baldin
01/07/2018 — 30/06/2019

Gregorio obtained his PhD in 2015 in history of philosophy at the University of Piemonte Orientale (supervisor: Gianni Paganini), he has been postdoctoral researcher at École Normale Supérieure de Lyon (LabEx Comod) and he taught history and philosophy in Italian high school. His research mainly deals with the spread of scientific and political ideas in 17th century, focusing on the figures of Thomas Hobbes and Paolo Sarpi. In his studies, he paid attention to: the development of Galilean science in Hobbes and Sarpi, the presence of the Republic of Venice in Hobbes's political philosophy, the question of the Interdict crisis in Hobbes, the influence of the myth of Gallic Hercules and the French religious wars in Hobbes's thought and the development of mathematical and scientific concepts in mid-17th century Paris. He is the author of Hobbes e Galileo. Metodo, materia e scienza del moto (Florence: Olschki, 2017), which will appear soon in English translation and La croisée des savoirs: Hobbes, Mersenne, Descartes (forthcoming). He also published several articles in Galilaeana, Rivista di storia della filosofia, Storia del pensiero politico. Within the framework of the ERC-*EarlyModernCosmology* project he worked on the theme "The Lion and the Leviathan: Hobbes, Sarpi and the Republic of Venice".

Predoctoral Fellows

Omar Del Nonno
01/09/2018 — ongoing

Omar is a PhD student. He studied at Università degli Studi Roma Tre in 2009 and graduated with a Bachelor thesis on "The Limits of Language in Wittgenstein" under the supervision of Paolo Virno in 2013. Afterwards, he moved to Berlin to continue his studies at the Humboldt Universität zu Berlin. There, he focused on Spinoza's Philosophy and the German Idealism and graduated with a Master Thesis entitled "The Reality of Finite Modes in Spinoza's Theory of Substance" under the direction of Dominik Perler. In his PhD project he takes the cue from Hegel's criticism of Acosmism to investigate Spinoza's Metaphysics.

Matteo Fornasier
01/09/2018 — ongoing

Matteo is a PhD student. He graduated at Università Ca' Foscari in 2018. His main interests concern the history of philosophy, especially Renaissance philosophy as well as early modern science and medicine. His research project is "Renaissance thinking in the medical culture of the Parisian Academy in early modern times".

Lukas Meisner
01/09/2019 — ongoing

Lukas is a PhD student. He received his undergraduate education in Philosophy and Comparative Literature from the Karls Universität Tübingen, the University of Essex and the Freie Universität Berlin, finishing it with a Bachelor thesis on Adorno's late work. Following that, he completed his Masters at the Sociology department of Goldsmiths College, University of London, with a dissertation on autonomy and political economy. In his PhD project, he is writing a political epistemology of the historic avant-gardes' artistic critique as an anticipatory ideology of post-modernisation. In doing so, he attempts to re-actualise Critical Theory for the 21st century.

Francesca Putignano
01/09/2018 — ongoing

Francesca is a PhD student. She has graduated with honors at the University of Bari, with a bachelor thesis in the field of Contemporary Studies and Gender Studies. She continued her studies at the University of Bologna where she graduated with honors with a master thesis's on Philosophy of Science. Part of her thesis work was done at the University of Helsinki in Finland, thanks to a scholarship she received. In Helsinki, she worked under the supervision of Kristina Rolin. Her main interests are feminist epistemology and philosophy of science and she focusses especially on socio-political consequences of scientific production. Her PhD project investigates the relevance of feminist epistemologies for a full-fledged political epistemological approach, which can shed light on the specific interrelations between social conditions, interests, biases and the production and reproduction of science.

Copy-editing

Lindsay Parkhowell

01/12/2017 — ongoing

Lindsay is the copy-editor of the ERC project *EarlyModernCosmology*. He is a graduate of Bard College, Berlin, and a former editorial assistant at the Max Planck Institute for the History of Science. He is also the Secretary for Propaganda and Poetics of the Avtonomi Akadimia, an adisciplinary, democratic arts University in Athens.

Guests and Associates

Nydia Pineda de Ávila
Universidad Autónoma de México (Mexico)
Visiting scholar from 23/09/2019 to 23/11/2019
Project: Situating cosmological debates in New Spain in global intellectual networks

Anna Jerratsch
Max Planck Institute for the History of Science, Berlin (Germany)
Associate
Project: The Comet of 1577 in Earlymodern Germany

Silvina Paula Vidal
Universidad Nacional de San Martín (Argentina)
Guest from 20/03/2019 to 25/03/2019
Project: Giordano Bruno's metaphor of the Spanish conquest as a "*swallowing whale*"

Senthil Babu
Institut Français de Pondichéry (India)
Visiting scholar from 01/02/2019 to 30/04/2019
Project: Canals and computations: a comparative understanding irrigation engineering and social relations in the Kaveri Delta in south India and Venice

Doina-Cristina Rusu
Faculty of Philosophy, University of Groningen (The Netherlands)
Visiting scholar from 08/10/2018 to 30/11/2018
Project: Cosmology and Redemption in Anne Conway's Metaphysics

Alberto Bardi
Polonsky Academy for Advanced Studies, Van Leer Jerusalem Institute (Israel)
Associate
Project: The Astronomical Manuscripts of the Bessarion's Collection at the Marciana Library

Dissemination

Workshops and Symposia in Venice

2020

May 6th
Interactive Online Workshop, Matiaz Vesel, Institute of Philosophy-Research Centre of the Slovenian Academy of Sciences and Arts, Ljubljana "The Nature of Copernicus's Hypotheses".

April 22nd
Interactive Online Workshop, Vittorio Morfino (University of Milano Bicocca), "The Marxist Tradition Against the Grain: On Plural Temporality".

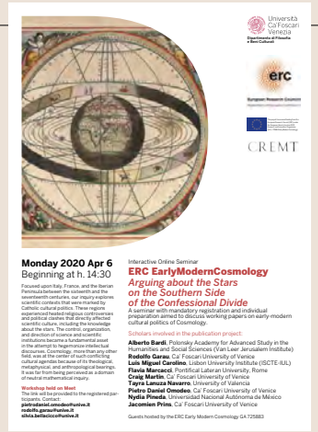
February 19th
Stefan Heßbrueggen (Higher School of Economics, Moscow), "Et spiritus Dei ferebatur super aquas. Mosaic Physics And Life In the Young Leibniz".

January 24th
Daniel Garber (Princeton University, Department of Philosophy), "Telesio's Iter Gallicum: Telesio in 17th C France" and Guido Giglioni (University of Macerata, Department of Humanities) "Sense and Consciousness in Bernardino Telesio". Presentation and discussion on the book "Bernardino Telesio and the Natural Sciences in the Renaissance" by the editor prof. Pietro Daniel Omodeo.

January 8th
Mariangela Priarolo (Ca' Foscari University of Venice), "Finalism without Finalism. Malebranche and Preformation" and Charles T. Wolfe (Ca' Foscari University of Venice) "Expanded mechanism and/or structural vitalism: further thoughts on the animal economy".

November 27th
Matteo Cosci (University of Padua), "Galileo under cover: Pseudonymous Writings on the New Star", discussant: David Juste (Bayerische Akademie der Wissenschaften, Munich).

November 20th
Nydia Pineda de Ávila (Universidad Nacional Autonóma de México & Visiting Researcher at Ca' Foscari University), "The moon as a space of dispute: confessional and institutional agenda in lunar nomenclature in the seventeenth century".



April 6th
Interactive Online Seminar "Arguing about the Stars on the Southern Side of the Confessional Divide" – A seminar with individual preparation aimed to discuss working papers on early-modern cultural politics of Cosmology. Scholars involved in the publication project: Alberto Bardi (Polonsky Academy for Advanced Study in the Humanities and Social Sciences – Van Leer Jerusalem Institute, Rodolfo Garau (Ca' Foscari University of Venice), Luis Miguel Carolino (Lisbon University Institute ISCTE-IUL), Flavia Marcacci (Pontifical Lateran University, Rome), Craig Martin (Ca' Foscari University of Venice), Tayra Lanuza Navarro (University of Valencia), Pietro Daniel Omodeo (Ca' Foscari University of Venice), Nydia Pineda (Universidad Nacional Autónoma de México), Jacomien Prins (Ca' Foscari University of Venice).

2019

December 18th
Maria Emanuela Scribano (University Ca' Foscari Venice), Barnaby Hutchins (Ghent University), "Rethinking Early Modern Vitalism".

December 11th
Anna Jerratsch (MPIWG Berlin), "Religious Contexts of Discourses on Nature. The Comet of 1577 in Early Modern Germany".

December 4th-5th
H Darrel Rutkin, "New Paradigms in the History of Knowledge: The Case of Astrology" in International Conference New Paradigms in the History of Knowledge.

October 30th
Ofer Gal (University of Sydney), "Baroque Astronomy. Doing without the eye: Descartes naturalized epistemology".

October 18th
Cassirer scholars, "Ernst Cassirer on Renaissance Thought".

2019

October 1st
Stephen Howard (KU Leuven), “Kant on the Boundary of the World”.

September 18th
Presentation by the author H Darrel Rutkin of the book “Sapientia Astrologica: Astrology, Magic and Natural Knowledge, ca. 1250-1800”, discussants: David Juste (Bayerische Akademie der Wissenschaften, Munich) and Monica Azzolini (Università degli Studi di Bologna).

June 19th
Hannah Marcus (Harvard University) and Cynthia Klestinec (Miami University), “Discussions on the History of Medicine”.

May 23rd
Razieh-Sadat Mousavi (Max Planck Institute for the History of Science / Humboldt-Universität zu Berlin), Jonathan Regier (Ghent University), Alberto Bardi (Dumbarton Oaks, Harvard University), “Cosmology in Early Medieval Islam – Through the lens of al-Farghānī’s *Elements of Astronomy*”.

May 21st-22nd
ERC-*EarlyModernCosmology* Workshop “Marsilio Ficino’s Cosmology: Sources, Reception, Historiography”.

March 7th
Gerardo Ienna (Università di Bologna – Dipartimento di Filosofia e Comunicazione), “Introduzione alle radici francesi dell’epistemologia storica”.

March 6th
Sascha Freyberg, Pietro Omodeo and Giulia Rispoli (Max Planck Institute for the History of Science, Berlin), with the participation of Gerardo Ienna (Università di Bologna, Dipartimento di Filosofia e Comunicazione), “Boris Hessen’s textbook on Classical Physics in the context of early Soviet approaches to historical epistemology”.

February 21st
Ralph & Dagmar Neuhäuser (University Jena – Astrophysical Institute and University Observatory, Jena), “Astrophysical and cultural relevance of historical celestial observations – examples from the 16th and 17th century”.

June 18th
Guido Giglioni (Università di Macerata) and Matteo Martelli (Università di Bologna), “A Conversation on Medieval and Renaissance Studies on Science”.

June 12th
Luca Guzzardi (Università degli Studi di Milano – Dipartimento di Filosofia), “Politics of Collaboration: The Case of Astronomy and Observatory Sciences in the Late Eighteenth Century”.

May 30th
ERC-*EarlyModernCosmology*/ ERC K4U Joint Conference “Mettere ordine al mondo: prospettive logiche ed epistemologiche su scienza, natura, società.

April 11th-12th
Flavio D’Abramo (Max Planck Institute for the History of Science – Visiting Postdoctoral Fellow), “Integrating science and politics: Ecological Developmental Biology and its historical roots”.

March 29th
Senthil Babu (IF Pondicherry & Visiting Ca’ Foscari Venice) and Roy Wagner (ETH Zürich), “Political Economy of Computational Work in History: The case of the Vernacular Math Traditions in India”.

March 20th
Silvina Paula Vidal (National Council of Scientific and Technological Research / Universidad Nacional de San Martín, Argentina), “Giordano Bruno’s metaphor of the Spanish conquest as a ‘*swallowing whale*’”

2018

February 21st
Stefano Gulizia (New Europe College, Bucharest), “Nicolaus Andreae Granius: Physics and Cosmology at Helmstedt”.

December 12th-13th
Pietro Daniel Omodeo, “Co(n)scienza: Riflessioni su discipline umanistiche e scienze esatte”, round table.

December 5th
Jean Sanchez (École Normale Supérieure, Paris), “Astrology in modern France”.

2018

Novembre 22nd
Doina-Cristina Rusu (University of Groningen and Visiting Scholar at Ca' Foscari), "Cosmology and Redemption in Anne Conway's Metaphysics".

October 17th
Stefan Zieme (HU Berlin), "Interpreting Art through the History of Science. Adam Elsheimer and the Renaissance Night Sky".

September 5th
Alberto Bardi (Deutsches Studienzentrum in Venedig), "The Astronomical Manuscripts of the Bessarione Collection at the Marciana Library".

June 18th
Dana Jalobeanu (University of Bucharest) and Roberto Bondì (Università della Calabria), "Telesio and Bacon: a conversation on Renaissance science and philosophy".

June 4th
Ana Simões (University of Lisbon), Claudia Stein (University of Warwick) and Roger Cooter (University of London), "Perspectives on epistemology and politics".

March 20th-21st
Bruno scholars, "Brainstorming for an Opera Dedicated to Bruno: Renaissance Science, Philosophy, and Art".

March 2nd-3rd
"Towards an Ethical-Political History of Early Modern Science", the ERC-EMC editorial project.

2017

December 12th
"Edition Open Access Berlin", the ERC-EMC editorial project.

November 13th-14th and 15th-18th
"Verum factum: Perspectives in Political Epistemology", the ERC-EMC book series.

Colloquia in Venice

These regular research meetings of the ERC-*EarlyModernCosmology* members held in Venice along the action to introduce and discuss their own research projects.

2020

May 20th
Online (Early Modernists). Discussion on the paper "The Political Epistemology of Campanella's Astrology" by Pietro Daniel Omodeo and Darrel Rutkin.

May 13th
Online (Political Epistemologists). Discussion on Haraway.

April 27th
Online (Early Modernists). Discussion on working papers by group members.

March 30th
Online (Political Epistemologists). Discussion of Foucault and Rose on biopolitics.

March 23rd
Online. Discussion of Sokal, Pseudoscience and postmodernism: Antagonists or fellow-travelers?

2019

March 13th
Online (Political Epistemologists). Discussion of Merchant, "The Death of Nature: Women, Ecology, and the Scientific Revolution".

February 5th
Discussion of "The Fall of Man and the Foundation of Science" by P. Harrison.

December 6th
Pietro Daniel Omodeo, Book discussion: "Political Epistemology".

June 12th
Marco Storni, "Institutions and Politics in the Debate over the Shape of the Earth, 1666-1740".

May 6th
Jacomien Prins, "Marsilio Ficino's *Timaeus* Commentary: Musical Speculations of a Renaissance Interpreter".

April 15th
Gregorio Baldin, "Against Aristotle and Metaphysics: Paolo Sarpi's Natural Philosophy".

March 20th
Rodolfo Garau, "Manuscript draft on the introduction to my book on the concept of conatus". Discussant: Omar del Nonno.

February 4th
Francesca Putignano, "Feminist Standpoint Theory: an Overview of Historical Roots and Epistemological Issues". Discussant: Sascha Freyberg.

January 16th
Matteo Fornasier, "Echoes of Renaissance Thought in Academic Medicine and Botany in Paris (XVI-XVII centuries)" Discussant: Rodolfo Garau.

2018

December 19th
Omar Del Nonno, "The behaviour of the free man in the Ethics and the Tractatus politicus". Discussant: Gregorio Baldin.

December 5th
Sascha Freyberg, "Ethico-political Consequences of Cosmology: Edgar Wind on Kant's Antinomies". Discussant: Omar Del Nonno.

November 22nd
Jacomien Prins, "Marin Mersenne: Harmonist at the Heart of the Scientific Revolution". Discussant: Darrel Rutkin.

October 17th
Gregorio Baldin, "The debate over Paolo Sarpi's religion". Discussant: Rodolfo Garau.

October 3rd
Darrel Rutkin, "What Makes Early Modern Cosmology 'Early Modern'?: Reflections on and a Suggestion for a Historical Periodization Scheme". Discussant: Pietro Omodeo.

September 26th
Pietro Omodeo, "Political Epistemology of Early Modern Cosmology".

Conferences and Talks by Group Members outside of Venice

2020

January 18th-21st
Pietro Daniel Omodeo and Senthil Babu, "A Copernican Revolution in the Lagoon: When a Galilean Mathematician Tried to Solve the Hydrogeological Problems of Venice" at the fifth international meeting of the Association for the Philosophy of Mathematical Practices, ETH Zurich (CH).

December 6th-7th
Francesca Putignano, "Feminist Epistemologies: Re-Conceptualize Objectivity" in The Irish Philosophical Society's 2019 Conference in Science, Politics and Philosophy, University College Cork (IR).

November 21st-22nd
Anna Jerratsch, "Religious Contexts of Discourses on Nature" in Workshop Sammeln und Deuten. Objekte der Wissenschaft und Wahrsagung, University of Münster (DE).

2019

December 17th
Pietro Daniel Omodeo, "L'immagine dello scienziato nel Rinascimento tra scienza pratica e cosmologia" (The Image of the Scientist in the Renaissance between Practical Knowledge and Cosmology) at Circolo della Cultura e delle Arti, Trieste (IT).

November 28th
Rodolfo Garau, "Quantifying the Criminal Mind" in International Conference The Quantification of Bodies, Coimbra (PT).

November 26th-28th
Omar Del Nonno, Ratio is Said in Many Ways: Reason, Rationality and Rationalization between the Modern and Contemporary Eras, Università di Napoli Federico II and Università degli Studi di Salerno (IT).

November 4th-5th
Rodolfo Garau, "On Gassendi's Eclecticism" in Conference Eclectic Philosophy in the 17th and 18th centuries, ICUB Research Institute of the University of Bucharest (RO).

October 11th-12th
Jacomien Prins, "Historical Roots of Modern Conceptions of Music as Medicine" in Conference The Medical Humanities: Art, Literature and Music in Medicine, University of Vienna (AT).

December 13th-14th
Francesca Putignano, 2nd Annual Political Epistemology Conference, Royal Academy of Arts and Sciences, Amsterdam (NL).

November 25th-27th
Marco Storni, "Du Châtelet on Newtonian Attraction" in Australasian Seminar in Early Modern Philosophy 2019, University of Queensland, Brisbane (AUS).

October 9th-10th
Charles T. Wolfe, "Expanded, heuristic mechanism or mechanism-friendly vitalism?" in Conference Antimeccanicismo e neovitalismo, University of Modena (IT).

December 13th
Charles T. Wolfe, "L'erreur vitale: antimathématisme, monstruosité et protovitalisme chez Diderot" in Conference L'épistémologie de l'erreur à l'époque moderne, Université Libre de Bruxelles (BE).

November 22nd
Marco Storni, "Autonomy and Patronage: Science, Academy and Monarchy between Paris and Berlin" in International workshop Scientific Academies, University of Sydney (AUS).

September 26th-28th
Pietro Daniel Omodeo (with Jürgen Renn), "Science in Court Society: Giovan Battista Benedetti's Diversarum speculationum mathematicarum et physicarum liber (Turin, 1585)" in X seminario sulla scienza antica e la sua tradizione, University of Milan, Gargnano (IT).

December 11th-15th
Charles T. Wolfe, "Locke et la naturalisation de l'esprit" in Séminaire d'Histoire de la Philosophie Moderne, Université de Paris-Nanterre, Paris (FR).

November 21st-22nd
Pietro Daniel Omodeo, "An vita hominis procedat ab materia coelesti subtilissima? An Early Modern Dispute on Cosmobiology between Frankfurt/Oder and Wittenberg" in Aristotle and Natural Philosophy at Early Modern Central European Universities, 1600-1700, Freie Universität Berlin (DE).

September 4th-6th
Pietro Daniel Omodeo, "Geoenvironmental Management in Renaissance Venice: When A Galilean Mathematician Tried to Solve the Hydrogeological Problems of the Lagoon" in Annual conference of the International Commission on the History of Geological Sciences (44th INHIGEO Symposium), Varese-Como (IT).

2019

July 27th
Rodolfo Garau, “The Polemic between Pierre Gassendi and Jean Baptiste Morin on Galileism, Copernicanism, and Galileian Astrology” in Annual meeting of the History of Science Society, Panel “As Above, So Below: Astrology, Comets, Volcanoes and Earthquakes in Medieval and Early Modern Europe”, Utrecht (NL).

July 23rd-27th
Pietro Daniel Omodeo, “The Cosmic Eros of Renaissance Vitalism: A Reassessment” in Annual meeting of the History of Science Society. Panel organization (with Jonathan Regier): “Nature and desire: Couliano’s Éros et magie à la Renaissance, 35 years later”, Utrecht (NL).

July 23rd-27th
H Darrel Rutkin, “Horoscopy in Medieval and Renaissance Europe: Reflections on Astrology and Divination in Annual meeting of the History of Science Society, Panel “Relation to Fate, Freedom and its Scientific Status”, Utrecht (NL).

June 26th-29th
Marco Storni, “Timekeeping in Early Modern Chemistry” in 12th Annual Conference of the International Society for Cultural History, Tallinn University (EE).

June 24th-28th
Pietro Daniel Omodeo, “Cesare Cremonini on the Heavens: Ontological Problems of Preclassical Celestial Physics” in Bucharest-Princeton Seminar in Early Modern Philosophy, Bran (RO).

June 23rd-28th
Rodolfo Garau, “Notes on the Gassendi-Morin polemic and the marginalization of astrology” in Bucharest-Princeton Seminar in Early Modern Philosophy, Bran (RO).

June 7th
Pietro Daniel Omodeo, “The Problem of Causality in Pre-Classical Celestial Physics” in (De)Constructing Authority in Early Modern Cosmology, University of Innsbruck (AT).

June 5th-7th
Marco Storni, “Early Eighteenth-Century Cartesian Epistemologies” in International conference Responses to Newton: the Impact of the Mathematical-Experimental Paradigm on Natural Philosophy, Epistemology and Metaphysics (1687-1800), KU Leuven (BE).

June 1st-3rd
Jacomien Prins, “Ficino and the *Timaeus* Commentary Tradition: Seeing and Hearing” in Foro di Studi Avanzati (Forum for Advanced Studies) Conference, Rome (IT).

July 12th
Sascha Freyberg, “Autonomy and overdetermination: on the correlation of chaoid and symbolic forms” in International Workshop Autonomie im Kontext von Kulturphilosophie, Technical University of Braunschweig (DE).

July 11th-12th
Jacomien Prins, “Marin Mersenne’s Reception of Humanist Theories of Music and the Soul” in conference Classical Reception in Philosophy of Music, Durham University (UK).

July 1st-5th
Omar Del Nonno, “The free Man in Spinoza‘s Ethics: between Model and Thought Experiment” in Summers School Collegium Spinozanum III, University of Groninga (NL).

June 12th-15th
Pietro Daniel Omodeo, “Cosmos and Psyche: Aristotelian Perspectives on Celestial Causality in the Renaissance” in Scientiae: Disciplines of Knowing in the Early Modern World, annual meeting, Plenary Session. Ca’ Foscari Panel: “Early Modern Aristotelianisms”. Queen’s University, Belfast (UK).

June 7th
Jacomien Prins, “Mersenne and Kircher on Sympathetic Vibration” in (De)constructing Authority in Early Modern Cosmology, Ludwig Boltzmann Institute for Neo-Latin Studies, Innsbruck (AT).

June 7th
H Darrel Rutkin, “Defending Roger Bacon: (Re)Constructing Thomas Aquinas as an Astrological Authority in 18th-Century Venice” in (De) Constructing Authority in Early Modern Cosmology, University of Innsbruck (AT).

May 29th-30th
Marco Storni, “Early Eighteenth-Century Cartesian Epistemologies” in Dutch Seminar in Early Modern Philosophy, VI, University of Groningen (NL).

May 27th-28th
Matteo Fornasier, Imaginative Conditions, *ens rationis* and Thought Experiments at the Sorbonne-University I (FR).

May 27th-28th
Omar Del Nonno, “The free Man in Spinoza‘s Ethics: between Model and Thought Experiment” in Imaginative Conditions, *ens rationis* and Thought Experiments at the Sorbonne-University I (FR).

2019

May 25th
Sascha Freyberg, "Morphological Principles of Iconology" in International Conference Iconologies, 23-25 May, University of Cracow (PL).

May 22nd
Francesca Putignano, seminar and pathfinders conversation with Helen Longino, Max Planck Institute for the History of Science, Berlin (DE).

May 21st
Francesca Putignano, Conference Neutrality Versus Partiality in Feminist Critiques of Science, Max Planck Institute for The History of science, Berlin (DE).

May 17th-18th
Gregorio Baldin, "Against Aristotle and Metaphysics: Paolo Sarpi's Natural Philosophy" in Les fondements d'une autre modernité/ The Foundations of Another Modernity, École Normale Supérieure, Lyon (FR).

May 16th-17th
H Darrel Rutkin and Pietro Daniel Omodeo, "The Political Epistemology of Tommaso Campanella's Astrology" in Conference Early Modern Science and Philosophy: A Conference Honoring Miguel Angel Granada, Ecole Normale Supérieure, Paris (FR).

April 11th-12th
Marco Storni, "Mécanisme, matière et force chez Maupertuis: les usages de Descartes et de Newton dans la Vénus physique" in Les usages de la métaphysique classique chez les matérialistes français du 18e siècle, École Normale Supérieure, Lyon (FR).

March 29th-31st
Matteo Fornasier, The Kil, the Alembic and the Clockwork, Centre for the Studies of Medicine and the Body in the Renaissance (CSMBR), Pisa (IT).

March 21st-23rd
Omar Del Nonno, Etica e passioni dell'anima. Spinoza con e contro Descartes, Università di Milano-Bicocca and Università Cattolica del Sacro Cuore (IT).

March 17th-19th
Jacomien Prins, "Music, Emotions and Tranquility of Mind in Renaissance Music Theory", Panel: Music, Emotions and Ethics, Renaissance Society of America Conference, Toronto (CAN).

March 13th
Rodolfo Garau, "Taking pleasure in history. Some notes on Catherine Wilson's history of Epicureanism and of philosophy" in Conference in Honor or Catherine Wilson, The University of York, York (UK).

Feb 28th-Mar 2nd
Pietro Daniel Omodeo, "Political Epistemology of the Copernican Revolution" in Die Frage 'Was ist Kosmos' im Dialog der Disziplinen, Universität Heidelberg (DE).

Feb 28th-Mar 2nd
Sascha Freiberg, Die Frage 'Was ist Kosmos' im Dialog der Disziplinen, Universität Heidelberg (DE).

2018

February 12th
Francesca Putignano, Conference "Che genere di darwinismo: biologia, cultura e questioni di genere", University of Rome (IT).

January 24th-25th
Sascha Freyberg, "Mikhail Lifshitz and the Contradictions of Modernity", at Symposium "Stalin Era Intellectuals, Culture and Stalinism", Aleksanteri Institute, University of Helsinki (FI).

December 21st
Omar Del Nonno, "Osservazioni sulla mereologia spinoziana. La connessione tra ontologia e politica nella filosofia pratica di Spinoza," in II Riunione della Societas Spinozana. Giornata di Studi: Spinoza: ipotesi e risultati, KNIR, Reale Istituto Neerlandese di Roma (IT).

December 18th
Rodolfo Garau, "The Anatomy of a Ridiculous Mouse? The Polemic between Pierre Gassendi and Jean Baptiste Morin on Astrology, Copernicanism, and Galileism" in International colloqium L'astrologie dans les communautés savantes françaises au 17e siècle, École normale supérieure, Paris (FR).

December 18th
H Darrell Rutkin, "Divination, Superstition and the Marginalization of Astrology: Discourses of Legitimacy and Marginalization from Thomas Aquinas to the Index of Prohibited Books (1564), the Two Anti-Astrological Bulls (1586 and 1631) and Beyond," in Astrologie dans les Communautés Françaises au 17e Siècle, École Normale Supérieure, Paris (FR).

December 6th-7th
Pietro Daniel Omodeo, "Homocentric Astronomy and the Animation of the Heavens: Girolamo Fracastoro beyond Scholastic Psycho-Dynamics" in Philosophical Cosmology in Early Modern Europe, University of Bucharest (RO).

2018

December 6th
Pietro Daniel Omodeo, “History and Philosophy of Science in the Age of Post-Truth”, public talk, University of Bucharest, Faculty of Philosophy (RO).

November 14th-16th
Sascha Freyberg, “Experimentalism avant la lettre: Edgar Wind on Research and Recollection” in International Workshop Mnemonic Waves, Warburg Institute, London (UK).

November 12th-17th
Pietro Daniel Omodeo, “Natural History and Human Praxis between Renaissance Vitalism and Magic” in Annual conference of the International Commission on the History of Geological Sciences (INHIGEO). Session organization (double session): “Early Modern Geological Agency”, Mexico City (MEX).

November 11th
Rodolfo Garau, “Gassendi’s Logic: Syllogism, Inductivism and Experiments” in International Symposium: Logic and Metaphysics in the Modern Era, Université Libre de Bruxelles – Vrije Universiteit Brussel, Bruxelles (BE).

November 8th
Pietro Daniel Omodeo, “Storia e filosofia della scienza nell’epoca della post-verità” (History and Philosophy of Science in the Age of Post-Truth) at Università popolare di Udine (IT).

October 25th
Pietro Daniel Omodeo, “Coordinate politico-culturali dell’affare Galileo” (Cultural-political coordinates of the Galileo affaire) in Galileo nel contesto, Università di Perugia, Dipartimento di Filosofia (IT).

October 22nd-24th
Pietro Daniel Omodeo and Francesca Putignano, Conference “Egemonia dopo Gramsci: una riconsiderazione (4)”, University of Urbino (IT).

October 18th-19th
Jacomien Prins, “Musical Ethos and Chaste Love in Early Modern Conceptions of the Good Life” in Conference: Inventing the Good Life: How Italy Shaped Early Modern Moral Culture, Wolfenbüttel/ Herzog August Bibliothek (DE).

October 11th
Pietro Daniel Omodeo, The Epistemic Functions of Vision in Science, University of Bergamo (IT).

September 16th
Rodolfo Garau, “Biological Individuality in Early Modern Science: The Cases of Gassendi and Descartes” in European Society for the History of Science, panel Unifying life from the Scientific Revolution, London (UK).

September 15th
Sascha Freyberg, “Metapolitics and the History of Science in Marburg Neo-Kantianism” in Conference of the European Society for the History of Science in conjunction with the British Society for the History of Science, London. Panel Towards a Curriculum of Political Epistemology: Theory and Case Studies (UK).

September 14th-17th
Pietro Daniel Omodeo, “Cultural Politics of Cosmology in Europe in the Early Modernity” in 8th conference of the European Society for the History of Science in conjunction with the British Society for the History of Science. Session organization (double session): “Towards a Curriculum of Political Epistemology: Theory and Case Studies”, London (UK).

July 30th
Rodolfo Garau, “Baconian Influences in Gassendi’s Logic?” in Bucharest-Princeton Seminar in Early Modern Philosophy, Bran (RO).

July 26th-28th
Pietro Daniel Omodeo (with Jonathan Regier), “Celestial Physics” in Revolutions in the History of Early Modern Philosophy and Science, Iowa State University (USA).

July 11th
Rodolfo Garau, “Gassendi vs Astrology. Corpuscularism and Action at a Distance in Early Modern France” in History of Philosophy of Science (HOPOS) Meeting panel “Action at a Distance”, Groningen (NL).

June 21st-22nd
Sascha Freyberg, “Experiment and Finalization: Science of Science in Society 1968” in International Conference Political Epistemologies of/ and Marxism 1917-1945-1968, HSE Poletayev Institute for Theoretical and Historical Studies in the Humanities, Moscow (RU).

Jun 7th
Pietro Daniel Omodeo, “A political turn in historical epistemology? Ideology and Science in Early Modern Cosmopolitics” in Sarton Centre for History of Science, Ghent (BE).

June 5th-8th
Sascha Freyberg, “Die Form und ihre Wirklichkeit. Zum Werk von Michail Lifschitz” in 32nd International Hegel Congress of the International Hegel-Society, University of Tampere (FI).

2018

May 21st
Pietro Daniel Omodeo, “Institutions and Metaphysics of Cosmology in the Epistemic Networks of Seventeenth-Century Europe” in Nicolaus Copernicus in the 21st Century: Context, Resources, Methods, Institute for the History of Science, Polish Academy of Sciences, Warsaw (PL).

2017

November 6th
Pietro Daniel Omodeo, Raccontare il Rinascimento: Telesio, Bruno e Campanella nei centri di ricerca europei, Centro di Studi Telesiani, Bruniani e Campanelliani, Cosenza (IT).

Publications

Monographs

Rodolfo Garau, *Conatus: History of an Early Modern Concept*, International Archives for the History of Ideas (manuscript, under contract by Springer), forthcoming.

Charles T. Wolfe, *Lire le matérialisme*, Lyon: ENS Editions, 2020.

Pietro Daniel Omodeo, Jürgen Renn, *Science in Court Society: Giovanni Battista Benedetti's* Diversarum speculationum mathematicarum et physicarum liber *(Turin, 1585)*, Berlin: Edition Open Access, 2019.

Pietro Daniel Omodeo, *Political Epistemology: The Problem of Ideology in Science Studies*, Dordrecht: Springer, 2019.

H Darrell Rutkin, *Sapientia Astrologica: Astrology, Magic and Natural Knowledge, ca. 1250-1800*, (in the series, "Archimedes: New Studies in the History and Philosophy of Science and Technology," ed. by Jed Z. Buchwald), Dordrecht: Springer, 2019, 3 vols. Volume I, "Medieval Structures (1250-1500): Conceptual, Institutional, Socio-Political, Theologico-Religious and Cultural".

Edited Volumes

Jacomien Prins, Edmund Thomas (eds.), *Plato's Timaeus and the Foundations of Medieval and Renaissance Thought: Philosophy, Science and Art*, Leiden: Brill, 2021, forthcoming.

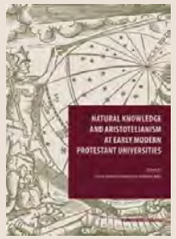
Pietro Daniel Omodeo (eds.), *Cultural Hegemony in a Scientific World: Gramscian Concepts for the History of Science*, Leiden: Brill, 2020, forthcoming.

Pietro Daniel Omodeo (ed.). Pietro Omodeo, *Amerigo Vespucci: The Historical Context of His Explorations and Scientific Contribution*, Venice: Edizioni Ca' Foscari, 2020.

Dana Jalobeanu, Charles T. Wolfe (eds.), *Encyclopedia of Early Modern Philosophy and the Sciences*, Dordrecht: Springer Online, 2020.

Pietro Daniel Omodeo (ed.), *Bernardino Telesio and the Natural Sciences in the Renaissance*, Leiden: Brill, 2019.

Pietro Daniel Omodeo, Rodolfo Garau (eds.), *Contingency and Natural Order in Early Modern Science*, Boston: Springer, 2019.



Pietro Daniel Omodeo, Wels Volkhard (eds.), *Natural Knowledge and Aristotelianism at Early Modern Protestant Universities*, Wiesbaden: Harrassowitz, 2019.

Refereed Journal Articles

	Marco Storni, "Cartography, Geodesy, and the Heliocentric Theory: Yves Simonin's Unpublished Papers," in *Centaurus*, accepted, forthcoming.	**Rodolfo Garau**, "A törekvés (*conatus*) fogalmának felépítése Spinozánál," in *Orpheus Noster*, 12(2) (2020) 11-35.
Charles T. Wolfe (ed.), coedited with Jonathan Regier and Boris Demarest, *Animism and its Discontents: Soul-Based Explanations in Early Modern Natural Philosophy and Medicine*, special issue of HOPOS (2020).	**Charles T. Wolfe**, "L'erreur vitale : antimathématisme et monstruosité chez Diderot," in *Dianoia: Rivista di filosofia,* 30 (2020) 115-125.	**Pietro Daniel Omodeo**, "A Cosmos without a Creator: Cesare Cremonini's Interpretation of Aristotle's Heaven," in *Journal of Early Modern Studies*, 8 (2019) 9-42.
Gregorio Baldin, "Chiesa, scomunica e potestas indirecta: Sarpi e Hobbes, lettori di Marsilio e critici di Bellarmino," in *Dianoia: Rivista di filosofia*, 28, 1 (2019) 109-130.	**Gregorio Baldin**, "'Falsehood, never. The Truth not to Everyone.' Philosophy, Dissimulation, and Atheism in Paolo Sarpi's Correspondence and Pensieri," in *Historia Philosophica*, 17 (2019) 11-32.	**Gregorio Baldin**, "Filosofie della sovranità. Sarpi e Hobbes eredi di Bodin," in *Giornale Critico della Filosofia Italiana*, XCVIII, 1 (2019) 55-74.
Gregorio Baldin, "Francis Bacon's Concept of spiritus and Thomas Hobbes," in *Rivista di Storia della Filosofia*, 3 (2019) 401-430.	**Gregorio Baldin**, "Nothing but the Name of God. Hobbes on Theology and Religion," in *Les Dossiers du Grihl, "Les dossiers de Jean-Pierre Cavaillé, Libertinage, athéisme, irréligion. Essais et bibliographie*," Online (2019).	**Gregorio Baldin**, "Paolo Sarpi e Hugo Grotius: un dialogo mancato? Alcune osservazioni su sovranità, Jus circa sacra e fundamentalia fidei," in *Isonomia* (2019) 1-37.
Sascha Freyberg, "Ansätze zu einer Beziehungsgeschichte der Prozessphilosophie (Doppelrezension)," in *Allgemeine Zeitschrift für Philosophie*, 44.3 (2019) 389-396.	**H Darrel Rutkin**, "Is Astrology a Type of Divination?: Thomas Aquinas, the Index of Prohibited Books and the Construction of a Legitimate Astrology in the Middle Ages and the Renaissance," in *International Journal of Divination and Prognostication* 1 (2019) 36-74.	**Pietro Daniel Omodeo**, "Soggettività, strutture, egemonie: Questioni politico-culturali in epistemologia storica," in *Studi Culturali*, XV (2018) 211-234.
Pietro Daniel Omodeo, "Traces of an Academic Career in Renaissance Brandenburg: The Scottish Mathematician and Physician John Craig at Frankfurt on Oder," in *History of Universities*, 31 (2018) 130-152.	**Pietro Daniel Omodeo, Irina Tupikova**, "Visual and Verbal Commentaries in the European Renaissance: Erasmus Reinhold's Treatment of Classical Sources on Astronomy," in *Philological Encounters*, 3 (2018) 359-398.	**Pietro Daniel Omodeo, Lindsay Parkhowell**, "Towards Another Sublime: Away from the Aesthetics of Destruction," in *Technology and the Sublime*, ed. by Giulia Rispoli and Christoph Rosol, journal special issue of *Azimuth. Philosophical Coordinates between Modern and Contemporary Age*, 12/2 (2018) 147-165.

Book Chapters

Pietro Daniel Omodeo, Jonathan Regier, "Celestial Physics," in *The Cambridge History of Philosophy of the Scientific Revolution*, ed. by Dana Jalobeanu and David Marshall Miller, Cambridge: Cambridge University Press (in press).

Pietro Daniel Omodeo, "Presence/Absence of Alexander of Aphrodisias in Renaissance Cosmo-Psychology," in *Alexander of Aphrodisias in the Middle Ages and the Renaissance*, ed. by Pietro B. Rossi, Matteo Di Giovanni, and Andrea A. Robiglio, Turnhout: Brepols, 2020, 175-193.

Anna Jerratsch, "Celestial Phenomena in Early Modernity: The Integrated Image of Comets," in *Natural Knowledge and Aristotelianism at Early Modern Protestant Universities*, ed. by Omodeo and Wels, Wiesbaden: Harrassowitz, 2019, 187-208.

Omodeo Pietro Daniel, Jonathan Regier, "The Wittenberg Reception of Copernicus: At the Origin of a Scholarly Tradition," in *Natural Knowledge and Aristotelianism at Early Modern Protestant Universities*, ed. by Pietro Daniel Omodeo and Volkhard Wels, Wiesbaden: Harrassowitz, 2019, 83-108.

Pietro Daniel Omodeo, "Asymmetries of Symbolic Capital in 17th-Century Scientific Transactions: Placentinus's Cometary Correspondence with Hevelius and Lubieniecki," in *Institutionalization of Science in Early Modern Europe*, ed. by Giulia Giannini and Mordechai Feingold, Leiden: Brill, 2019, 52-80.

Pietro Daniel Omodeo, "Epicurean Astronomy? Atomistic and Corpuscular Stars in Kepler's Century," in *Kepler's New Star: Context and Controversy*, ed. by Patrick Boner, Leiden: Brill (2021, in press).

Jacomien Prins, "'Not for Irrational Pleasure': Music in Marsilio Ficino's *Timaeus* Commentary," in Jacomien Prins and Edmund Thomas (eds.), *Plato's Timaeus and the Foundations of Medieval and Renaissance Thought: Philosophy, Science and Art*, Leiden: Brill (2021, in press).

Pietro Daniel Omodeo, Alberto Bardi, "The Disputational Culture of Renaissance Astronomy: Johannes Regiomontanus's *An terra moveatur an quiescat*," in *Early Modern Disputations and Dissertations in an Interdisciplinary and European Context*, ed. by Robert Seidel, Leiden: Brill, 2020, 233-254.

Pietro Daniel Omodeo, "Practices and Theories of Contingency in Renaissance Approaches to Nature," in *Contingency and Natural Order in Early Modern Science*, ed. by Pietro Daniel Omodeo and Rodolfo Garau, Boston: Springer, 2019, 93-114.

Pietro Daniel Omodeo, "*Secundum quid* and *Contingentia*: Scholastic Reminiscences in Early Modern Mechanics," in *Contingency and Natural Order in Early Modern Science,* ed. by Pietro Daniel Omodeo and Rodolfo Garau, Boston: Springer, 2019, 157-180.

Pietro Daniel Omodeo, "Telesio and the Renaissance Debates on Sea Tides," in *Bernardino Telesio and the Natural Sciences in the Renaissance,* ed. by Pietro Daniel Omodeo, Leiden: Brill, 2019, 116-145.

Pietro Daniel Omodeo, Alberto Bardi, "La *quaestio* 'An terra moveatur an quiescat' di Giovanni Regiomontano," in *Acta Conventus Neolatini Albasitensis*, Proceedings of the Seventeenth International Congress of Neo-Latin Studies (Albacete 2018), ed. by Florian Schaffenrath and María Teresa Santamaría Hernández, Leiden: Brill, 2020, 440-450.

Rodolfo Garau, "Descartes' Physics in Le Monde and the Late-Scholastic Idea of Contingency," in *Contingency and Order in Early Modern Science*, ed. by Rodolfo Garau and Pietro Daniel Omodeo, Series: Boston Studies in the Philosophy and History of Science, Dordrecht: Springer, 2019, 199-217.

Rodolfo Garau, "The Transformation of Final Causation: Telesio's Theories of Self-Preservation and Motion," in *Bernardino Telesio and the Natural Sciences in the Renaissance*, ed. by Pietro Daniel Omodeo, Leiden: Brill, 2019, 231-251.

Pietro Daniel Omodeo, "Die wissenschaftliche Kultur des Mathematikers, Artzes und Kalendermachers Lorenz Eichstaedt (1596-1660)," in *Schreibkalender und ihre Autoren In Mittel-, Ost- und Ostmitteleuropa (1540-1850)*, ed. by Klaus-Dieter Herbst; Werner Greiling Bremen: Edition lumière, 2018, 109-136.

Pietro Daniel Omodeo, "Socio-Political Coordinates of Early-Modern Mechanics: A Preliminary Discussion," in *Emergence and Expansion of Pre-Classical Mechanics*, ed. by Rivka Feldhay, Jürgen Renn, Matthias Schemmel, Matteo Valleriani, Cham: Springer, 2018, 55-78.

Pietro Omodeo, "The Social Position and Intellectual Identity of the Renaissance Mathematician-Physicist Giovanni Battista Benedetti: A Case Study in the Socio-Political History of Mechanics," in *Emergence and Expansion of Pre-Classical Mechanic*, ed. by Rivka Feldhay, Jürgen Renn, Matthias Schemmel, Matteo Valleriani, Cham: Springer, 2018, 181-213.

Encyclopedia Entries

Matteo Fornasier, "Microcosm and Macrocosm in the Renaissance," in *Encyclopedia of Renaissance Philosophy*, ed. by Marco Sgarbi, Dordrecht: Springer Online, 2020, 1-3.

Matteo Fornasier, "Teleology in Renaissance Science," in *Encyclopedia of Renaissance Philosophy*, ed. by Marco Sgarbi, Dordrecht: Springer Online, 2020, 1-2.

Garau Rodolfo, "Conatus," in *Encyclopedia of Early Modern Philosophy and Science*, ed. by Dana Jalobeanu and Charles T. Wolfe, Dordrecht: Springer Online, 2020.

Rodolfo Garau, "Mazzoni, Jacopo," in *Encyclopedia of Renaissance Philosophy*, ed. by Marco Sgarbi, Dordrecht: Springer online, 2019.

Pietro Daniel Omodeo, "Scientific Revolution, Ideologies of the," in *Encyclopedia of Early Modern Philosophy and the Sciences*, ed. by Dana Jalobeanu and Charles T. Wolfe, Dordrecht: Springer Online, 2020, 1-10.

Charles T. Wolfe, "Vitalism in Early Modern Medical Thought," in *Encyclopedia of Early Modern Philosophy and the Sciences*, ed. by Dana Jalobeanu and Charles T. Wolfe, Dordrecht: Springer Online, 2020.

Charles T. Wolfe, "Early Modern Medical Materialism," in *Encyclopedia of Early Modern Philosophy and the Sciences*, ed. by Dana Jalobeanu and Charles T. Wolfe, Dordrecht: Springer Online, 2020, 1-6.

Reviews

Pietro Daniel Omodeo, Omar Del Nonno, "Review of Manuel Mertens, *Magic and Memory in Giordano Bruno: The Art of a Heroic Spirit*" (Leiden: Brill, 2018), in *Isis* 111/2 (2020), 388-390.

Charles T. Wolfe, "The early modern subject of experience. Review of Christopher Braider, Experimental selves: person and experience in early modern Europe" (Toronto: University of Toronto Press, 2016), in *Metascience* (online first 2020).

Pietro Daniel Omodeo, "An Apology for Bruno, review of Alberto A. Martínez, *Burned Alive: Giordano Bruno, Galileo and the Inquisition*" (London: Reaktion Books, 2018), in *Journal for the History of Astronomy*, 50/2 (2019), 253-255.

Pietro Daniel Omodeo, "Kuhn's Historical-Epistemological Pragmatism, review of Bojana Mladenović, Kuhn's Legacy: Epistemology, Metaphilosophy, and Pragmatism" (New York: Columbia University Press, 2017), in *Isis* (2018), 824-826.

Online Articles

Omodeo, Pietro Daniel. "The Origin of the Idea of Material and Life Cycles in the Ancient Cosmos of Concentric Spheres," in *Technosphere Magazine*, 12 (2018).

Open Access Book Series

Our open access book series resulting from a collaboration with Berlin (Edition Open Access) are launched as hybrid publication in line with the new needs—and digital opportunities—of scientific dissemination. It merges different scientific genres with the digital edition of sources in the history of science.

Such mixed editorial forms already exist and have proven particularly successful in communicating the results of specific research topics. The publications will be numbered progressively like a journal and will appear in one of the two series, “Verum factum: Studies and Sources on Political Epistemology” and “Knowledge Hegemonies in the Early Modern World,” depending on their bearing.

All publications in these series will be available in an open-access format. The benefits of openness and flexibility have been demonstrated by the experience of the EOA over the past ten years. They range from the rapid circulation of ideas to high quality readability of documents, new citation forms, connection of publications to databases and to digital tools, and the possibility of multi-phase publications.

Most importantly, a scholarly open access series allows for the publication of sources and studies that would not otherwise be printed by profit-oriented publishers due to “lack of market”, despite their great value for research, which in our case is historical and epistemological inquiry. Scholarly works published in this series will be connected with databases and digital repositories such as the European Cultural Heritage Online (http://echo.mpiwg-berlin.mpg.de), which provides a model for the secure and lasting storage of documents, digitized books, and other sources in the history of science.

Verum Factum: Studies and Sources on Political Epistemology

This series is dedicated to the investigation of how the different dimensions of knowledge relate to the political. This concerns the motivating as well as delimiting, its informing as well as corrupting consequences. It should bring into focus the collective and oriented character (telos) of knowledge production and science. The title quotes Giambattista Vico’s famous principle to emphasize the activity (praxis) from which knowledge emerges. Instead of giving it a definite interpretation we thus call for inquiry into the relation of telos and praxis, i.e. the agencies and dynamics which determine the collective production of knowledge.

The series aims to provide a trans-disciplinary and global forum of discussion about the genesis, validity, interrelations and consequences of epistemic activity. It is open to contributions and interventions from different fields and perspectives. The relational focus on the interferences of epistemic activities or cultural realms respectively, contrasts the tendency of meta-scientific disciplines (HPS, SSK, STS, etc.) to become isolated, self-referential endeavors. Meta-science, education and the dissemination of knowledge do not only inform the images of science but also the bodies of knowledge by shaping basic attitudes, science policies and research agendas.

A prevailing image of science has been for a long time that of an intellectual institution aiming to improve the conditions of human life through the advancement of learning. This Enlightenment view has been cast into doubt for many reasons, but particularly in consideration of the uses and abuses of techno-scientific developments. Their devastating consequences and perceived irrationality has suggested the irrationality of science itself, its methods, its development and the arbitrariness of its goals. Still, contemporary societies await the realization of the promises of scientific advance in a future to come. However, the question arises if such promises are purely technological and utilitarian devoid of political aims of emancipation and a common good.

In order to address such questions, it is necessary to enter the factory of knowledge production and to consider how it works. How is scientific labor organized? How are matter and meaning intertwined? How does knowledge production interact with public discourse, social ideals, ideology, economic interests, and the constitution of political hegemonies? How can the apparently disunited strands of science and knowledge production be understood in a unified cultural understanding with its historical, ecologic, socio-economic and political dimensions?

Left: Frontispiece of Giambattista Vico's *Scienza nuova*, 1744.
Below: Verum Factum, logo.

VERUM FACTUM

In a perspective, which revives the question of science in society, the logic of science by no means has to be abstracted from the empirical, e.g. the political economy of which it is a pivotal element. Epistemology thus has to address the conditions of possibility in a broader sense. Practices and models, development and organization of these processes should be considered in relation to their implicit or presupposed principles and explicit rules and aims.

If the Baconian dictum "power is knowledge" is confronted with the question of Vico's principle it becomes clear that what is at stake is not only the transformation of the natural environment but at the same time that of society (and finally culture at large). This brings the question about particular and/or collective interests behind the construction of the environment into focus. In general terms the problem arises, if it will be possible to seize (or regain) the means of knowledge production and

redirect scientific labor and the institutions of knowledge and intelligence toward emancipative and collectively favorable goals.

Since this problem has not been formulated only recently, the series will also encompass the republication of (often unacknowledged) classical texts and their critical assessment alongside new explorative studies, methodologies and interventions. Its overall aim is to encourage a dialogue with a more systemic view on the problem of science, the world and society from a critical political-epistemological perspective.

Formats and Open Access Policy

The series is open to format and genre diversity. It acknowledges different means and ways of inquiry and is open to monographs, collective volumes, republications, translations, dissertations, research reports, essays, pamphlets and even documentaries.

New formats and digital experimentation are welcome, as well as new ways of presenting the circulation of sources. The series will mainly publish in English, Italian and German, but is open to other languages if editorial arrangements can be made. It explicitly wants to encourage translation projects. All texts in this series will be available in a real open-access format ('gold'). At the same time high quality standards in the reviewing and editorial processes are pursued.

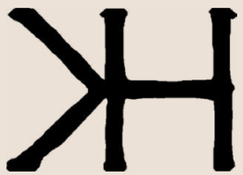
The series is supported by the Edition Open Access (EOA) of the Max Planck Institute of the History of Science in Berlin. The benefits of openness and digital flexibility intrinsic to the approach of EOA range from the rapid circulation of ideas to high quality readability of documents, new citation forms, connection of publications to databases and to digital tools, and the possibility of multi-phase publications. Most importantly, a scholarly open access series allows for the publication of sources and studies that would not otherwise be printed by profit-oriented publishers due to lack of clearly identified market, despite their great value for research.

Knowledge Hegemonies in the Early Modern World: Sources and Commentaries

This series, published by Edizioni Ca' Foscari in collaboration with Edition Open Access (Berlin) and the Max Planck Institute for the History of Science (Berlin), is devoted to the social-cultural study of early modern knowledge cultures (ca.1450-1750). It promotes source-based studies that highlight the importance of science as a collective praxis, understood as a contested field informed by political, philosophical and confessional struggles for cultural hegemony, and in connection with social and economic interests. The emphasis on the political and ethical dimensions of agency should complement existing narratives on the materials, techniques, and meanings of learned and artistic practices. Moreover, since early modern knowledge was articulated and modified through its circulation within various realms of society, including artisanal circles and academic networks, it is crucial to investigate the institutional, political, and ideological settings of early-modern knowledge cultures. In how far did political antagonisms, ideological struggles, and religious tensions hinder scientific development or underpin it? How did the modern construction of identity along confessional, linguistic, and political lines affect the ethos and epistemic values of the sciences? What hegemonic values underpinned the early modern transformation of life and knowledge production?

To deal with struggles for knowledge hegemonies implies to value political subjectivity, initiative, and action in their capacity to redirect the structural elements that emerge from history.
Among the many cultural forms of knowledge, science seems to have a tight connection with the production and reproduction of material life conditions of society, although it is closely linked to the immaterial and symbolic spheres of culture, as well. The concept of knowledge hegemony emphasizes the collective subjectivity as the driving force of political and epistemic transformations.

A special emphasis is put on the integrated presentation of sources and commentary studies. Each publication will make available (or link to) digitally available historical sources the studies are based on.



Knowledge Hegemonies, logo.

State of the Art and Desiderata

Over the last four decades, taking inspiration from fields such as cultural anthropology and STS, historians of science have increasingly turned their lens to the exploration of situated knowledge practices. More recently, with the turn to global history, the field has further broadened to interrogate how knowledge is produced, transmitted and appropriated in specific times and places and the power structures shaping relationship between actors and ideas, skills, materials and techniques and between different locales. Grand modernist narratives of the past, which told a story of European 'progress' and scientific 'supremacy', have been successfully questioned and replaced by a more nuanced agenda. History of early modern science today understands scientific knowledge and identities no longer as simply 'neutral' or 'objective' but as a product of complicated knowledge and power constellations, specific to time and place.

In spite of the widening of our field, the cultural-political dimension of science—that is to say, its place within hegemonic projects, ideological clashes, and struggles for meaning—still warrants further exploration. The attention to individual actors at the center of the cultural turn, although beneficial for specific case studies, has often obfuscated the collective dimension of intellectual endeavors and their particular objectives. Specific studies which draw upon this fundamental premise will form a comparative enquiry into the political esprit of knowledge and ultimately into the ethos which the community imparts onto knowledge and vice versa.

Prospects

In light of this program, the investigation of scientific practice will be enlarged to include scientific praxis, that is, a consideration of political agendas. This implies an integration of the study of epistemic values by reassessing agency as expressly linked to the moral (individual), ethical (individual but collectivity oriented) and political (collective) spheres of life and human interaction and association. Our series calls for a closer investigation of the manner in which such cognitive virtues are connected with practical virtues, ethical and political in the strict sense. We especially invite scholars to consider the cultural-political embedment of scientific knowledge, with particular reference to the collective directedness of science as a contested field of cultural-hegemonic struggles.

Philosophy [nature] is written in that great book which ever is before our eyes — I mean the universe — but we cannot understand it if we do not first learn the language and grasp the symbols in which it is written. The book is written in mathematical language, and the symbols are triangles, circles and other geometrical figures, without whose help it is impossible to comprehend a single word of it; without which one wanders in vain through a dark labyrinth.

Galileo Galilei, *Discorsi*, 1638

The Early Modern Cosmology research endeavor utilizes a two-pronged approach to the study of early modern cosmology. It proposes a comparative inquiry into early-modern cosmologies by placing them in the context of their institutional, political, religious, and ideological settings, and also employs these case studies to make broader, more methodological reflections in a new area of historical epistemology we refer to as 'political epistemology'.

The fact that cosmological polemics in early modernity were often inserted into a religious framework should not obscure the eminently political character of the many and diverse attempts to hegemonize scientific debates through cultural, educational, and editorial means. Furthermore, because these cultural conflicts over cosmology concerned the categories of science itself, and not merely the content produced by scientific activities, it is also essential for the ERC endeavor to engage with epistemology. Therefore, we inquire into the historical developments of science from the viewpoint of the metaphysical and epistemological principles of the science of the time, as well as from the viewpoint of present-day questions about the nature of our scientific modernity.

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