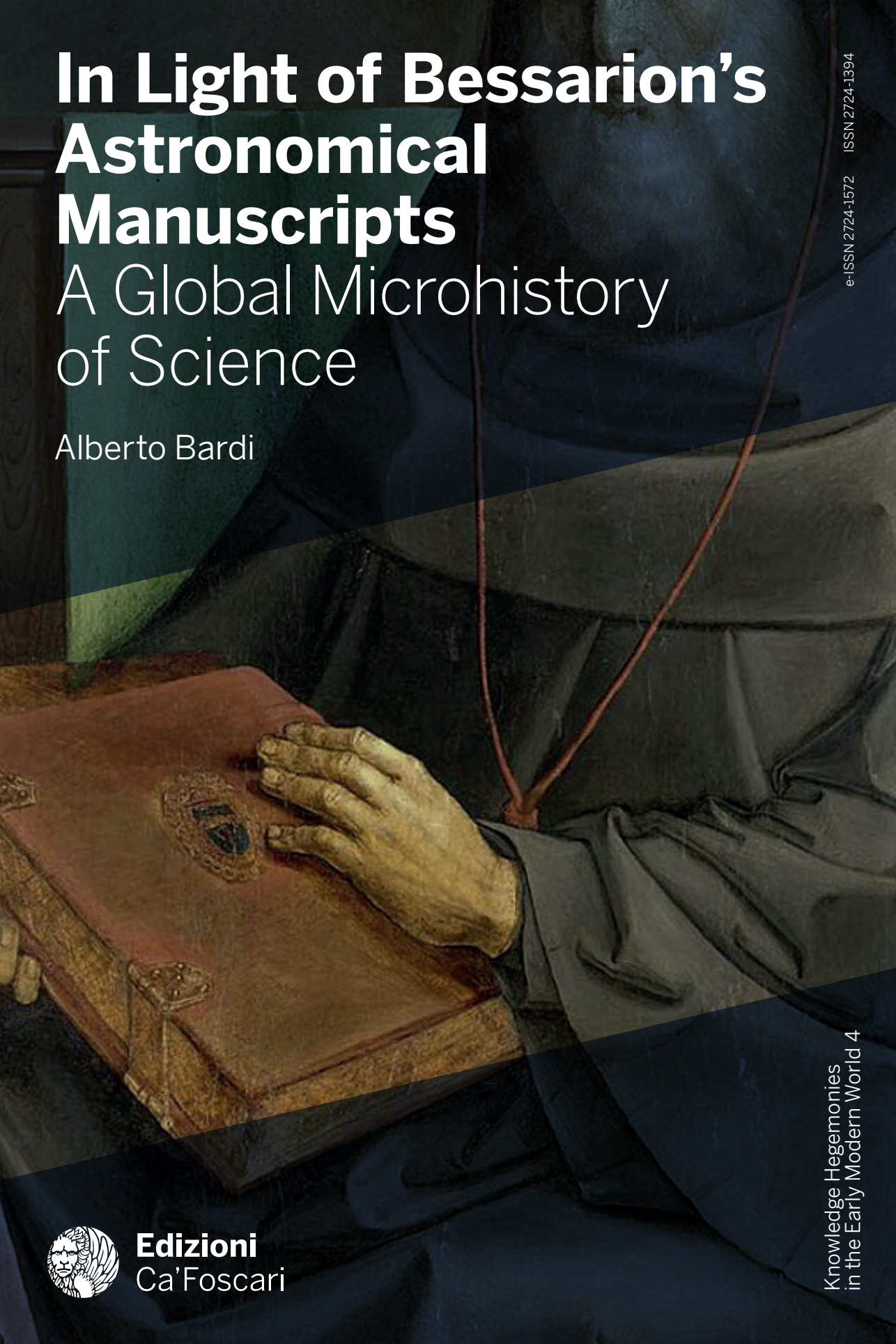
In Light of Bessarion's Astronomical Manuscripts

A Global Microhistory of Science

Alberto Bardi



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Abstract

The heritage of Byzantine astronomical knowledge brought into the rest of Europe features the coexistence of Arabo-Persian and Hellenistic astronomy. This book shows how the Byzantine scientific inheritance can reshape our understanding of science in Renaissance Europe. In other words, it provides a new interpretation, different from the standard narrative on Western science in the fifteenth century, through a study of non-Western sources used by Byzantine scholars migrating to Latin Europe. More precisely, the second half of the fifteenth century has been described as a time of renewal for scientific and philosophical studies in Europe, notably those concerning the heavens. According to a prominent narrative, the fifteenth century saw intellectual enrichment thanks to the rebirth of Greek science, which was revivified through the unveiling of the pure sources of Greek authors after the dark period of the Middle Ages and was saved from the menace of the Ottoman Empire. This narrative is problematic for several reasons. First, it assumes the purity of Greek science, which must have remained uncontaminated through all those centuries, as if a disembodied entity, whereas science is a human activity which suffers the modifications and corruptions of the flux of history. The weakness of this narrative is also shown by the fact that it generated two sclerotised conceptions still adopted in the history of science. An examination of primary sources in Bessarion's collection shows that what is generally conceived of as Greek science was part of a heritage in which Arabo-Persian scientific works had been assimilated and merged with the Greek tradition thanks to the work of Byzantine scholars. Moreover, why would the Ottomans have rejected the Byzantine scientific heritage? This is likely part of a narrative constructed by some humanists, probably serving an anti-Islamic agenda. Was Bessarion part of this movement? This book provides a global microhistory of science. What significance does the existence of a global microhistory hold? Despite Bessarion's political views proving unsuccessful and his status as an émigré hindering full integration into the Church of Rome, he remains one of the important figures engaging in political and scientific patronage in Italy. His astronomical education embodied a fusion of cultures, and his support for astronomy reflected this cultural amalgamation. This is underscored by the global impact of the sources he bestowed upon Venice. It is worth noting that future astronomers would rely heavily on works in Bessarion's collection, such as the *Almagest* and the *Persian Tables*: Nicolaus Copernicus revisited the *Almagest*, while Ismael Boulliau and others utilised the *Persian Tables*.

Keywords Bessarion. Manuscripts. History of Astronomy. History of Science. Science Historiography. Global History. Microhistory. Middle Ages. Early Modernity. Renaissance.

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Introduction

The latter half of the fifteenth century stands as a momentous period characterised by significant changes not only in trade routes (e.g. the famous discovery of Columbus) but also in scientific and philosophical inquiry throughout Europe, particularly in the realm of astronomical studies. These constituted the necessary premises for the cosmological novelties that transformed intellectual life of sixteenth-century Europe onwards, as well as their global implications. Traditional narratives often attribute the intellectual flourishing of fifteenth-century Europe to the so-called rebirth of Greek science, supposedly rejuvenated by the rediscovery of ancient Greek texts, following the obscurity of the Middle Ages, and shielded from the perceived threats posed by the Ottoman Empire.[1]

However, I consider this narrative problematic for several reasons and it warrants scrutiny on several fronts. First, it presupposes an idealised notion of Greek science as a pristine and immutable entity unaffected by the vicissitudes of historical context. Yet, as a human endeavour, science inevitably evolves and adapts within the currents of history. Moreover, this narrative has fostered entrenched misconceptions in the historiography of science, perpetuating the notions of Greek science's purity, preserved by Byzantine

1 Cf., among others, Taton, *Ancient and Medieval Science*, 180-242; Popper, *The Myth of the Framework*, 40-3; Russo, *The Forgotten Revolution*; Deming, *Science and Technology in World History*, 26-31.

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scholars emigrating to Western Europe, and its alleged revival in the fifteenth and sixteenth centuries.

A closer examination of primary sources, particularly within the collection of the Byzantine scholar Bessarion, reveals a more nuanced reality. Contrary to prevailing assumptions, Greek scientific knowledge was intricately intertwined with non-Byzantine contributions, transmitted and synthesised by Byzantine scholars over centuries. Bessarion's astronomical manuscripts, in particular, showcase a convergence of Arabo-Persian and Hellenistic astronomical traditions within the Byzantine scientific milieu.[2] Moreover, the narrative surrounding Bessarion's role in safeguarding Greek science from Ottoman encroachment warrants re-evaluation. How then should we shape our understanding of science in Renaissance Europe? Why would the Ottomans have rejected the Byzantine scientific heritage? This is likely part of a narrative constructed by some humanists, likely serving an anti-Islamic agenda. Was Bessarion part of that movement?

By answering these questions, this book provides a new interpretation, different from the standard narrative on Western science in the fifteenth century, through a study of non-Western primary sources used by Byzantine scholars and émigrés. Methodologically, the central emphasis of the present work extends beyond mere examination of sources to encompass the intricate interplay between these sources and the scholars who engaged with them, as well as the dissemination of knowledge facilitated by the analysis of the texts contained within these sources. Of particular relevance is the transmission of works between the Middle East and Europe, often via translation. These dynamics find vivid expression in the life and pursuits of Bessarion. Although a brilliant talent and an exponent of the Byzantine social stratum who had access to education, he belongs to a minority, or better two minorities: those Byzantine émigrés in Italy and those who believed in reconciliation between the Church of Constantinople and the Church of Rome. Consequently, this work positions Bessarion as the focal point of a microhistorical narrative, wherein his scholarly pursuits had a global impact, transcending both cultural and geographical confines. Through this lens, the book seeks to pursue a nuanced exploration of global microhistory. Therefore, Bessarion's life and scholarly endeavours, alongside his astronomical manuscripts, serve as a microcosm through which to examine the transition from the Middle Ages to Early Modernity within the sphere of scientific history. This perspective provides a rich context for an understanding of the broader shifts and developments during this pivotal period in intellectual history.

This book is not for readers seeking a monograph replete with primary sources and extensive quotations from unpublished materials, in which such sources would be expected to provide exhaustive evidence. It does not primarily engage in philological investigations or manuscript studies. Although it benefits from documented evidence and scholarship on primary sources, the research outlined in the forthcoming pages is grounded in the assumption that

> history is not only what is reflected in documents but also what was lost in the cracks between them. The role of the historian is not only to recover

2 Rigo, "Bessarione, Regiomontano"; Privitera, Accendere (a cura di), *Bessarione. La natura delibera*.

> sources and to synthesise them into a coherent narrative but also to take a bold step in attempting to recover what was lost in the cracks between the documents. Deductive logic and intelligent deductions fill in the cracks and bring about a thicker historical narrative.[3]

Knowledge of Bessarion's scientific and philosophical background is required to understand the relevance of Bessarion's astronomical manuscripts. On this account, this book is arranged in two parts. Part 1 consists in a series of Bessarion's significant biographical episodes (full biographical accounts exist, there is no need for an additional one). Chapter 1 concerns itself with Bessarion's life and education, focusing on the cultural climates he experienced in fifteenth-century Trebizond, Constantinople, and Mistra. Chapter 2 traces what Bessarion learned about astronomy from his teachers John Chortasmenos in Constantinople and Georgios Gemistos Plethon in Mistra; it focuses on some astronomical texts provided in a manuscript transcribed by Bessarion (*Marcianus graecus* Z. 333), testifying to his apprenticeship in astronomy in Constantinople and constituting a remarkable document to understand his education and his further interests in astronomy. Chapter 3 deals with Bessarion's political activity in Italy against the Ottomans and his patronage of the astronomer Regiomontanus. At that point, the reader will have acquired the tools to explore Bessarion's astronomical manuscripts more in detail.

Part 2 begins with the acknowledgment that achieving a completely objective perspective devoid of any form of positioning is an unattainable ideal. Nevertheless, striving towards an ideal of impartiality is deemed worthwhile. As articulated by Italian anthropologist Ernesto De Martino:

> An absolutely non-ethnocentric perspective is theoretically absurd and practically impossible, as it would mean stepping out of history in order to contemplate all of the cultures, including the western one. Thus, the only possibility I see is to employ western categories of interpretation in a non-dogmatic manner. This is a critical use, that is, it is controlled by the explicit awareness of the western historical genesis of those categories and the need to enlarge and recast their meaning through their comparison with other historical-cultural worlds.[4]

Acknowledging these epistemological constraints, Chapter 4 recognises that Bessarion's astronomical manuscripts have predominantly been scrutinised through the lenses of philology, codicology, and Byzantine studies. However, an exploration from the perspective of cross-cultural history can potentially reveal insights beyond those previously provided. The introduction of astronomical sources into Italy by Bessarion served as a conduit for intercultural exchange, necessitating an inquiry into how disparate cultural milieus responded to the knowledge encapsulated within these sources – a narrative not inherently evident within the texts themselves. In such instances, historians are tasked with employing imagination and discernment to speculate on the dynamics of knowledge dissemination. Through

3 Ben-Zaken, *Cross-Cultural Scientific Exchanges*, 6.

4 Transl. by Pietro D. Omodeo, in Omodeo, *Political Epistemology*, 38.

this lens, Bessarion's astronomical manuscripts emerge as pivotal components in the narrative of global history.

In summary, the manuscripts suggest that Hellenistic and Arabo-Persian astronomy both relied on Ptolemy's principles, yet they diverged in their foundational approaches to scientific investigation. The intellectual environments of second-century Alexandria and thirteenth-century Maragha or Tabriz differed markedly, with the former emphasising astrology and philosophical reflection, the latter concentrating on the computation of prayer times and the development of calendars tailored to Islamic communities. These distinct motivations shaped the pursuits of Islamic astronomers, whose collective body of work is commonly known, for simplicity's sake, as Arabo-Persian astronomy.

Chapter 5 is an evaluation of the cultural significance of Bessarion's astronomical manuscripts through a novel framework. This framework diverges from the conventional interpretation that views these manuscripts solely as conduits for the preservation of 'Greek astronomy' among European intellectuals. Instead, it conceptualises them as agents facilitating the transmission of a hybrid astronomical culture into the Renaissance milieu. The notion of 'hybridity' is employed to denote the amalgamation of disparate forms of knowledge, resulting in the emergence of a novel and internally cohesive entity. In contrast, eclecticism is characterised by the accumulation of diverse knowledge forms that retain their distinctiveness without converging into a unified whole.

All in all, the present study reveals Bessarion's cultural politics and the consequences his views had in the subsequent historiography of science. Bessarion's cultural politics is connected to how historiography of science has been written until recently. Eurocentrism has been overemphasised, and Bessarion's microhistory allows us to rethink the transition from the Middle Ages to Modernity in global terms.

The rest of this book is here: https://edizionicafoscari.unive.it/it/edizioni4/libri/978-88-6969-856-9/