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Sally P. Ragep

# Jaghmīnī's *Mulakhkhaṣ*

An Islamic Introduction to Ptolemaic  
Astronomy

 Springer

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ISSN 2196-8810 ISSN 2196-8829 (electronic)  
Sources and Studies in the History of Mathematics and Physical Sciences  
ISBN 978-3-319-31992-6 ISBN 978-3-319-31993-3 (eBook)  
DOI 10.1007/978-3-319-31993-3

Library of Congress Control Number: 2016962632

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The registered company is Springer International Publishing AG  
The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

to F. Jamil Ragep

A Prequel

## Preface

Maḥmūd al-Jaghmīnī's thirteenth-century *al-Mulakhkhaṣ fī al-hay'a al-basīṭa* provided an accessible introduction in the premodern period to Ptolemaic theoretical astronomy, for both specialists and the educated public throughout Islamic lands. It played a crucial role in the teaching, dissemination, and institutional instruction of Islamic astronomy; and the base Arabic text served as the starting point for at least sixty-one commentaries, supercommentaries, glosses, and translations (into Persian, Turkish, and Hebrew) that were composed and studied well into the nineteenth century and even beyond. The topics include basic astronomical definitions and concepts, parameters of the motions of the planets and the Earth's inhabited zone, and, above all, a structure or configuration (*hay'a*) of the universe that offered a scientific account of God's creation.

The impact and longevity of the influence of the *Mulakhkhaṣ* are not in question, as evidenced by thousands of extant copies of the original and its various derivatives contained in repositories worldwide. However, the focus until now has been on the work itself, leaving unaddressed questions such as: why was the *Mulakhkhaṣ* commissioned; who was Jaghmīnī's target audience; and what kind of a society produced such a scholar? Moreover, ambiguity in the literature about the date for Jaghmīnī's *floruit* led to speculation that there were two Jaghmīnīs, a thirteenth-century scholar who composed the ubiquitous astronomical work *al-Mulakhkhaṣ*, and a fourteenth-century namesake who authored the equally popular medical treatise *al-Qānūnča*. Establishing that there was only one Jaghmīnī who composed a corpus of introductory scientific works during the late twelfth/early thirteenth centuries under the auspices of the Khwārizm Shāhs in Central Asia highlights that this period just before the Mongol invasions was not one of scientific stagnation, as is so often asserted. Rather, it indicates a continuity of scientific learning within Islamic lands and furthermore suggests a demand for works in the mathematical sciences and the desire of those societies to promote scientific education.

The fact that I refer to Jaghmīnī's *Mulakhkhaṣ* as an *Islamic* introduction to Ptolemaic astronomy, rather than simply an introduction to Ptolemaic astronomy, warrants some clarification. The commissioning of the *Mulakhkhaṣ* needs be situated within an Islamic context related to major and interconnected social, political, and religious transformations that were occurring during the late twelfth and early thirteenth centuries. Specifically, textual and conceptual transformations were altering the way the discipline of *hay'a* (theoretical astronomy) was being taught,

which were concurrent with institutional transformations that resulted in the codification and systematization of the teaching of both religious and non-religious subjects. In conjunction with this, the ‘ulamā’ were attempting to consolidate their position vis-à-vis the rulers and ruling elites, and one way of accomplishing this was to bring a substantial number of the public into contact with their understanding of Islam through teaching in the madrasas. It is my contention that the *Mulakhkhaṣ* fulfilled a growing demand for a simplified, user-friendly introductory textbook on theoretical astronomy; it was a work not just geared for a broad audience, but a treatise whose structure and content offered madrasa students a physical cosmography glorifying God’s entire creation, both His celestial and sublunary realms.

Although my primary intention is to provide a critical edition and English translation of, and commentary on, this important and influential treatise for specialists in the field, anyone interested in learning the basics of Ptolemaic astronomy, and how it is presented to an Islamic audience, will benefit. Scholars engaged in the study of Islamic theoretical astronomy will be able to use the base text to trace textual and conceptual changes and developments that occurred over time and space through the ensuing commentaries and translations. In addition, the Arabic-English glossary of technical astronomical terminology enables those with a rudimentary knowledge of Arabic to read the edition and get a sense of Jaghmīnī’s pedagogical style and erudition. I should add that I made great efforts to capture these features in the English translation so that a general reader could learn what constitutes an elementary introductory textbook on theoretical astronomy in Islamic lands; this will be useful for comparisons with other traditions, in particular that of the Latin West. An important point for comparative studies is that this “beginner” treatise is far from simple and requires at least some prior knowledge of astronomy and mathematics.

Jaghmīnī and his *Mulakhkhaṣ* play center stage in this book; however, it is my sincere hope that the issues raised, especially in the Introduction, will be useful for future research in a number of areas. It is noteworthy that after composing the *Qānūnča*, Jaghmīnī dedicated his *Mulakhkhaṣ* to a certain Badr al-Dīn al-Qalānisī, whose family hailed from Damascus and whose fame (as far as we know) was not in astronomy but in pharmacology. Among other things, this highlights ongoing scholarly pipelines throughout Islamic regions as well as the importance of avoiding the all too prevalent practice of examining scientific fields in isolation. It also serves to underscore the vibrant activities occurring in the various sciences during this understudied period.

I could not have written this book without the generosity and support of a great many people whom I am extremely grateful to acknowledge. With deep appreciation, I thank Len Berggren for his careful read, comments, and suggestions. I am indebted to Tzvi Langermann, Faith Wallis, and Robert Wisnovsky, for sharing their expertise and meticulous attention to detail; and to Rula Abisaab, who first introduced me to the Khwārizm Shāhs. I owe special thanks to Sajjad Nikfahm-Khubravan, Fateme Savadi, and Hasan Umut, all who assisted with translations, manuscript analyses, acquisitions, and proofreading. I am beholden to Sean Swanick and the late Stephen Millier (formerly of McGill’s Islamic Studies Library), who tracked down crucial works for me; Robert Morrison, who brought the Hebrew translation of the *Mulakhkhaṣ* to my attention; Reza Pourjavady and Devin DeWeese, who provided me with various Persian sources; Taro Mimura,

who, among other things, discovered a miniscule *Mulakhkhaṣ* text embedded within a codex margin; Issa Boulatta, who helped me uncover Jaghmīnī's poetical side; and the late Mercè Comes, Raine Daston, Adam Gacek, Judith Pfeiffer, Emilie Savage-Smith, Pouneh Shabani-Jadidi, all who supported me in innumerable ways.

This book would not have been possible without the assistance of many libraries that allowed me access to their collections: the Bašagić Collection of Islamic Manuscripts, University Library of Bratislava; the Bibliothèque nationale de France, Paris; the Süleymaniye Library and the Topkapı Sarayı Müzesi Library, Istanbul; the Staatsbibliothek, Berlin; the Forschungsbibliothek, Gotha; the Rare Book and Manuscript Library Collection, University of Pennsylvania; the Islamic Manuscripts Collection, Princeton University Library; Cambridge University Library; Oriental Collections, Leiden University; the Dār al-kutub, Cairo; and, various libraries throughout Iran, including those within Isfahan, Qum, and Tehran. I owe special thanks to the Süleymaniye Manuscripts Library and the Türkiye Yazma Eserler Kurumu Başkanlığı, Istanbul, and the Staatsbibliothek, Berlin, for permission to reproduce images from their collections. I am also indebted to the support of the Rational Sciences in Islam (RaSI) database research project housed at McGill University, and especially the Islamic Scientific Manuscript Initiative (ISMI) component.

Special heartfelt thanks go to İhsan Fazlıoğlu, who has generously shared his vast knowledge of the Islamic mathematical sciences over the years, and to Michael Powell and Angela Libby, both of whom graciously entered unwittingly into my Jaghmīnī world, and became invaluable complements to our family sphere. Finally, no words can convey what I owe to the late Mollie Palchik, for her unmitigated love and support that permeate still. And to Lina, Anwar, and Jamil—as boundless as I know the *Mulakhkhaṣ* tradition is, it will never be as extensive as my love for them.



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