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Teaching a More Accurate and Inclusive History of Science

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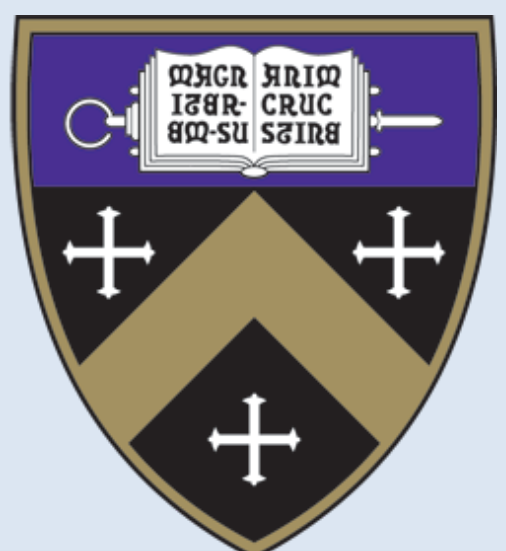
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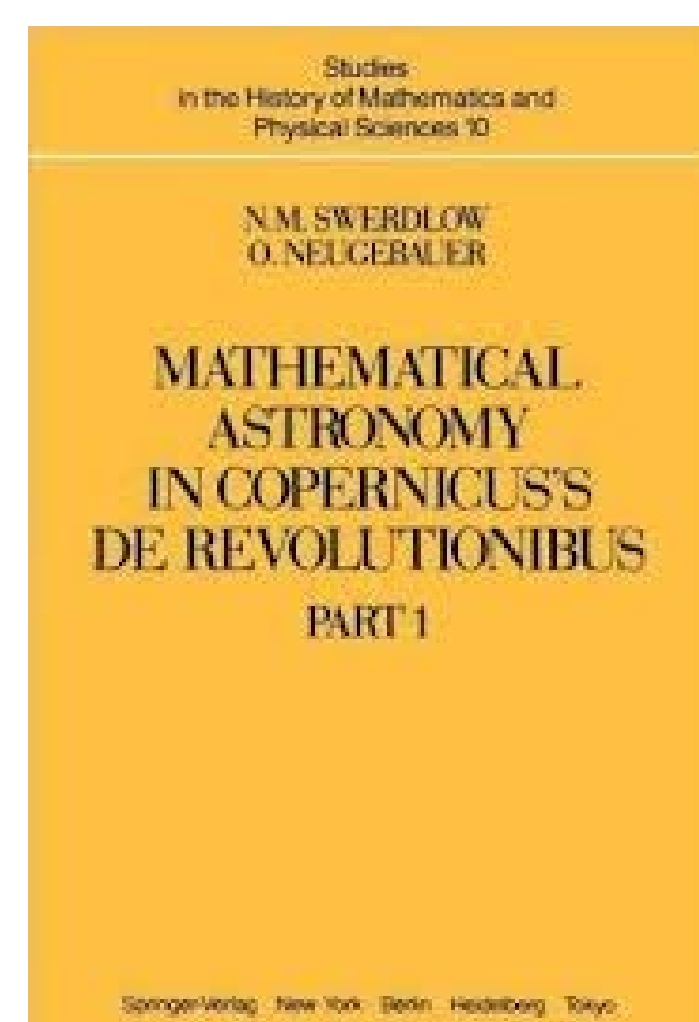


Teaching a More Accurate and Inclusive History of Science

Noah Aydin, Kenyon College, October 2018

ABSTRACT

Thanks to research on primary sources in the last few decades, we know that some of the most fundamental concepts of modern math and science are a legacy of the medieval Islamic Civilization. These contributions, however, are generally not known and not taught in schools due to an inaccurate narrative of history of science that has been in circulation for a long time. There is a great need to disseminate the accurate information to the general public.



"In a very real sense, Copernicus can be looked upon as, if not the last, surely the most noted follower of the Maragha School" (p. 295)

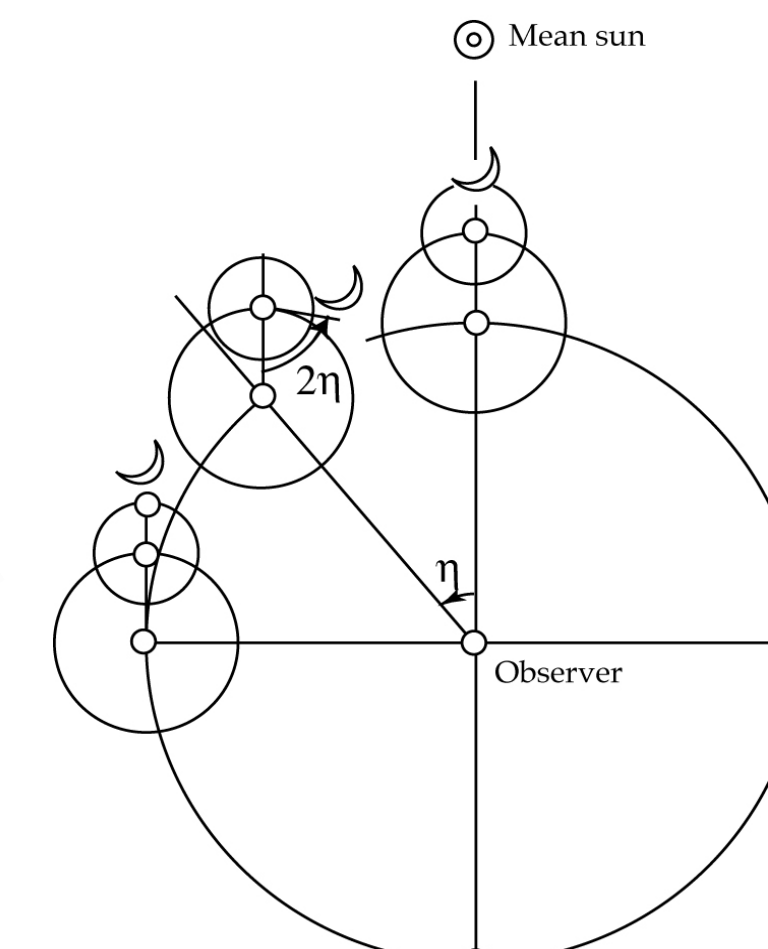
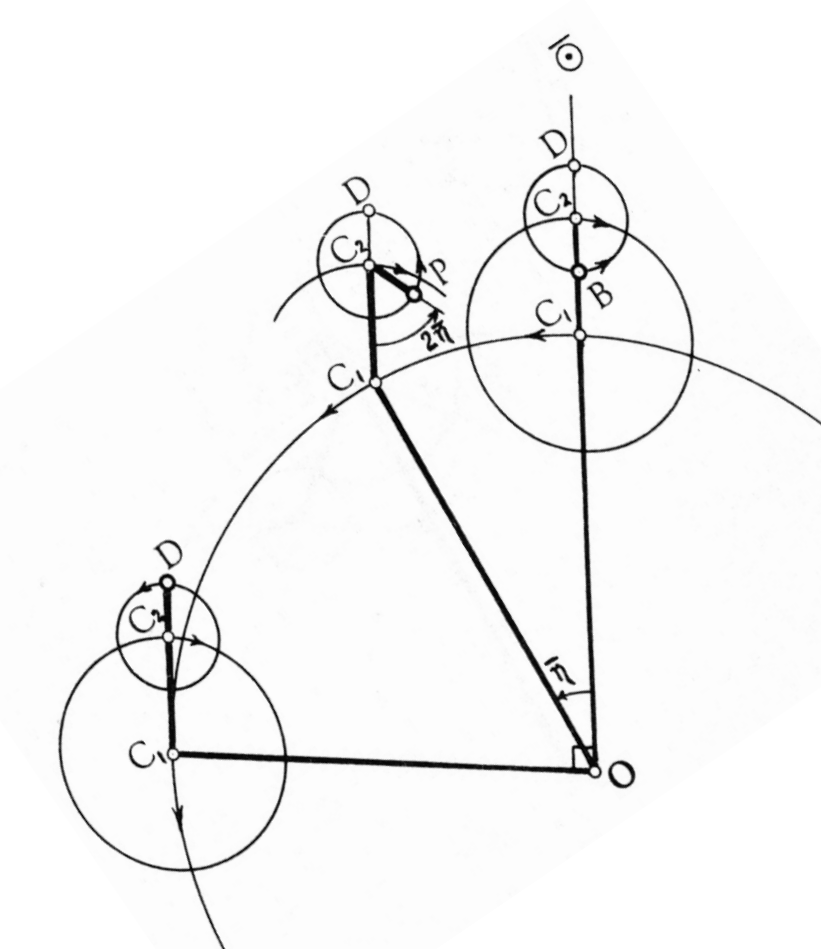
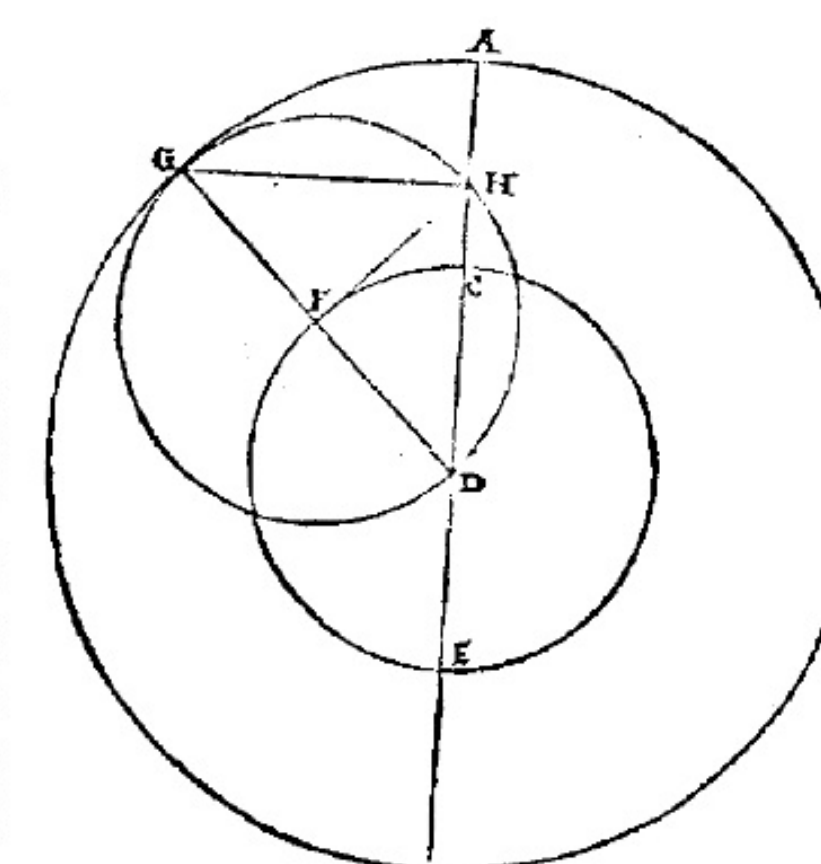
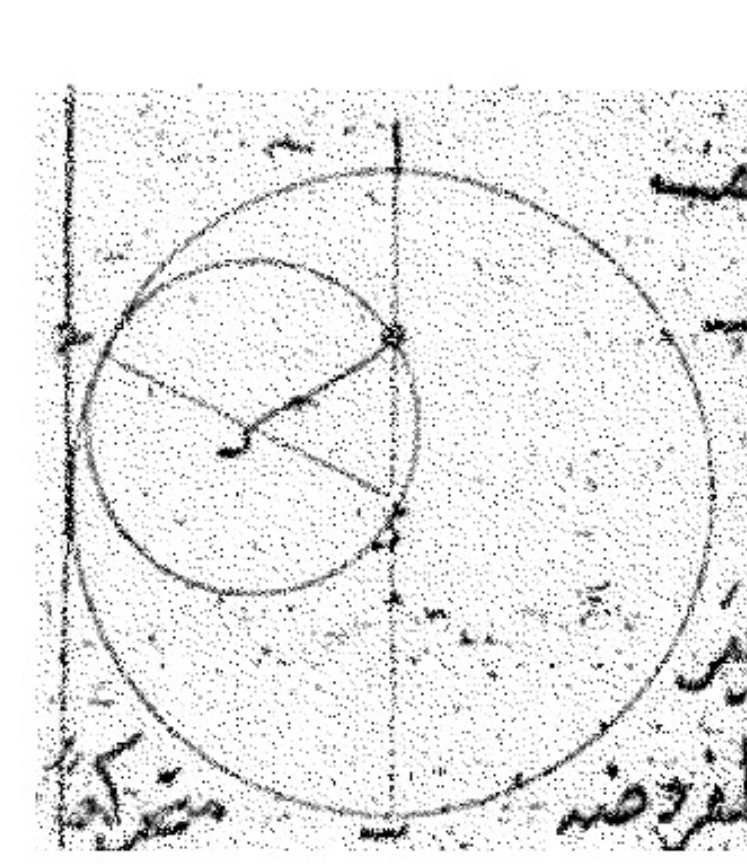
A Sample of Islamic Contributions to Math and Science

- Scientific method
- Foundations of optics
- Algebra الجبر
- Trigonometry
- Decimal point and decimal fractions
- Medicine, philosophy, chemistry
- Geography, map making, navigation
- Many scientific terms from Arabic: algorithm to zero
- Pulmonary blood circulation
- Many star names from Arabic
- Observatory as scientific institution
- Important works in astronomy used by Copernicus and Renaissance scholars

Islamic Scholars' Influence on Copernicus



Remarkable Similarities between Copernicus Islamic Scholars



Tusi (d. 1274) vs Copernicus (d. 1543)

Copernicus vs Ibn Shatir (d. 1375)

Copernicus directly used scientific materials in mathematics and astronomy from multiple Islamic scholars who lived centuries earlier. This fact is generally unknown and hardly taught in schools.

What Needs to be Done? How can you Help?

- Need to disseminate accurate information
- Need to include this material in school curriculum
- Need to update school curriculum
- Talk to teachers, principals, administrators
- Talk to politicians, educational policy makers, and leaders
- Educate yourself on the subject
- Inform your kids, family, and friends
- Help increase awareness
- Support events, activities and research

Classical Narrative

- Euro-centric
- Not based on evidence
- Has been around for centuries
- Belittles, downplays or ignores Islamic contributions
- Refrigerator Theory: translation only, no significant original contribution
- Europe recovers classical Greek science after "dark ages"
- Wide spread
- Caused much damage: misattributions, misconceptions, credit not given when it is due

Alternative Narrative

- Based on evidence, primary sources
- Explains historical, social, and political factors behind remarkable progress in sciences in Islamic Civilization
- Examines exchange of scientific ideas between civilizations
- Supported by recent research
- Not widely known
- Usually not taught in schools
- Golden age was a longer period
- Many original contributions to math & science that was highly influential on Renaissance Europe

References & Resources

- Islamic Science and Making of the European Renaissance, G. Saliba, 2007
- Episodes in the Mathematics of Medieval Islam, J. L. Berggren, 2016
- Ibn al-Haytham: First Scientist, B. Steffens, 2007
- Pathfinders: The Golden Age of Arabic Science, J. al-Khalili, 2012
- The Crest of the Peacock: Non-European Roots of Mathematics, G. G. Joseph, 2011
- Islam & Science, BBC documentary, available online
- The MacTutor Islamic Math <http://turnbull.mcs.st-and.ac.uk/~history/Indexes/Arabs.html>

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