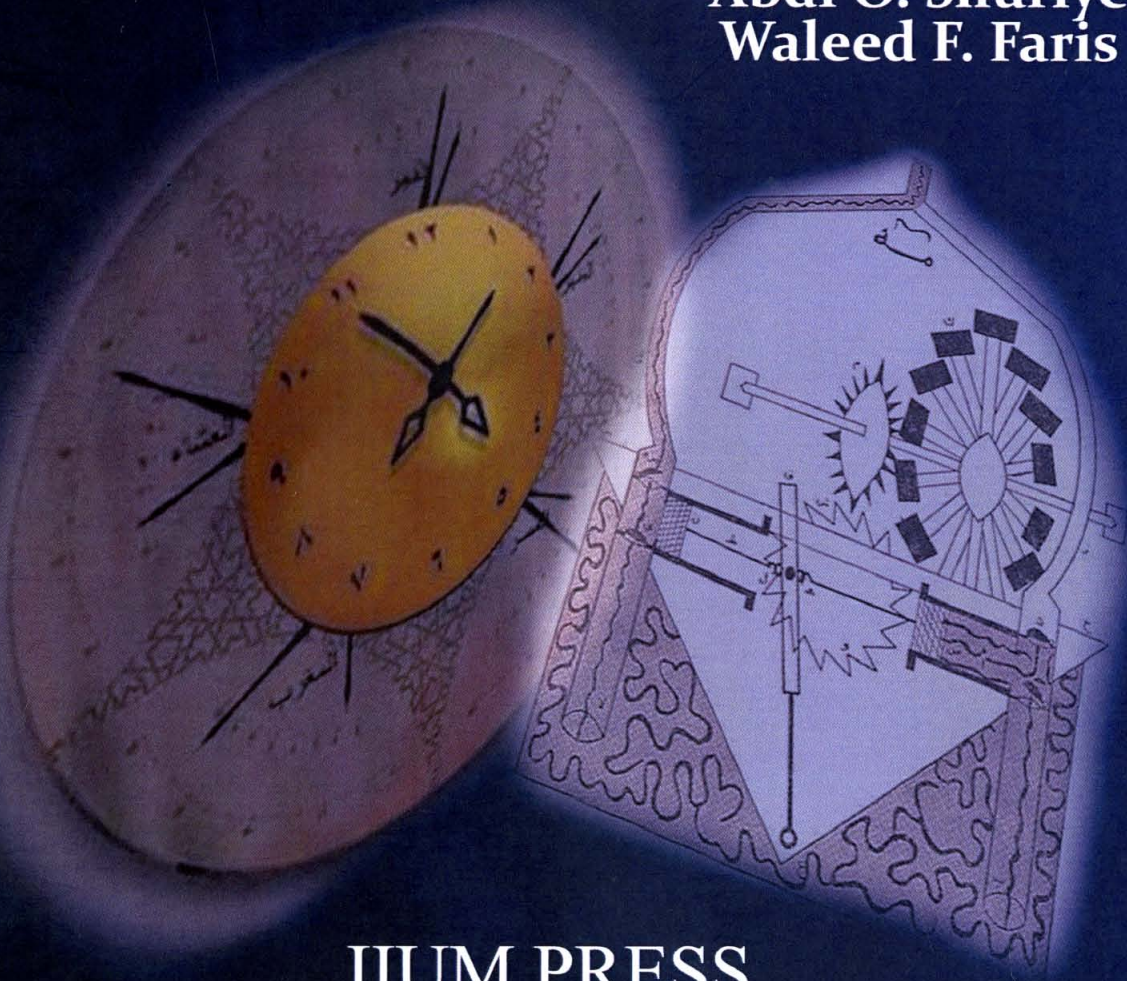


Contributions of Early Muslim Scientists to Engineering Studies and Related Sciences

Abdi O. Shuriye
Waleed F. Faris



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Editors

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Contents

TITLE

Preface	v
Acknowledgment	vi
Lists of Contributors	vii
Introduction	1
Chapter 1 Al-Battani's Contribution to Astronomy	3
Chapter 2 Safiha by Al-Zarqali	8
Chapter 3 Ibn Al Shatir's Influence on Modern Astronomy	12
Chapter 4 I-Zarqali on Instrumentation	19
Chapter 5 Contributions of Al-Razi on Alchemy in Terms of Metal and Substance	24
Chapter 6 Jabir Ibn Hayyan's Work on Sulphur-Mercury Theory	30
Chapter 7 The Contribution of Hassan Al-Rammah to Gunpowder and Rocket Technology	36
Chapter 8 The Contribution of Ibn Al-Awwam in Botany and Agriculture	41
Chapter 9 Al-Battani Contributions in Astronomy and Mathematics	45
Chapter 10 Al-Biruni's Views on the Discovery of the Spherical Earth	49
Chapter 11 Al-Kashi and Access to the Arithmetic & Astronomy	53
Chapter 12 Nasir Al-Din Al-Tusi's Understanding of Trigonometry	58
Chapter 13 Al-Biruni's Experimental Scientific Methods in Mechanics	65
Chapter 14 Al-Haytham's Understanding of Physical Nature of Light	70
Chapter 15 Contributions of Ibn Al-Haytham on Optics	74
Chapter 16 Energy Particle-Physics: The Efforts of Abdel Nasser Tawfik	80
Chapter 17 Mahmoud Hessaby's Contribution to the Infinitely Extended Particles Theory in Quantum Physics	86
Chapter 18 The Contribution of Ibn Ishaq Al-Kindi to Light, Optics and Cryptology	91
Chapter 19 The Contribution of Ibn Sahl in Refraction of Light	95
Chapter 20 Al Kindi on Pharmacology	103
Chapter 21 Contributions of Kerim Kerimov in Aerospace Engineering	110
Chapter 22 Fazlur Rahman Khan's Understanding of Tube Structural System of Skyscrapers	115

Chapter 23	Contribution of Lofti Asker Zadeh to Fuzzy Logic	121
Chapter 24	The Nano World of Munir Nahfey	127
Chapter 25	Abbas Ibn Firnas's Contribution in Aviation	135
Chapter 26	Al- Jazari Contribution to the Development of Water Supply System	139
Chapter 27	Contribution of Tipu Sultan to Rocket Technology	143
Chapter 28	The Contributions of Al - Khazini in the Development of Hydrostatic Balance and its Functionality	147
Chapter 29	The Contribution of Banu Musa Brothers in the Self Changing Fountain	155
Chapter 30	The Invention of the Helium-Neon Gas Laser by Ali Javan	160
Chapter 31	Al-Jazari on Automata	165

CHAPTER TEN

AL-BIRUNI'S VIEWS ON THE DISCOVERY OF THE SPHERICAL EARTH

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10.1 INTRODUCTION

The objective of this chapter is to explain the concept of spherical earth and the data used is collected from reliable sources. The technique of Eratosthenes was used to measure the circumference of the earth, 200 years before Al Biruni. However, this chapter investigates the method used by Al-Biruni to find the earth's circumference and this was the most precise calculation of earth's circumference during the medieval period. The chapter also explores the mathematical solutions that were provided by Al-Biruni to determine the circumference and radius of the earth. Hence, the significance of this chapter is to present Al-Biruni's concept of spherical earth.

10.2 CONCEPTUAL ON SPHERICAL SHAPE OF THE EARTH

The shape of the earth is close to that of an oblate spheroid which is a sphere flattened along the axis from pole to pole in such a way that there is a bulge around the equator. This bulge results from the rotation of the earth. Earth's circumference and diameter differ because its shape is classified as an oblate spheroid or ellipsoid, instead of a true sphere. It causes the diameter of the earth at the equator is 7,926.28 miles (12,756.1 km) while the earth's diameter at the poles is 7,899.80 miles (12,713.5 km). The circumference of the earth at the equator is 24,902 miles (40,075 kilometers), while the circumference of the earth through the poles is 24,860 miles (40,008 kilometers) (Edward, 1889, p.69).

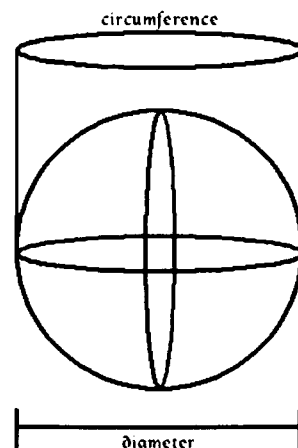


Figure 10.1: Adopted from: (<http://www.lyberty.com/encyc/articles/earth.html>)