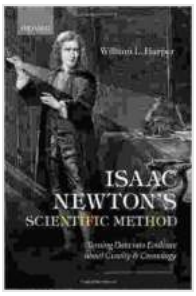
Turning Data Into Evidence About Gravity And Cosmology

The detection of gravitational waves in 2015 was a major scientific breakthrough. It confirmed the existence of gravitational waves, which had been predicted by Albert Einstein's theory of general relativity. It also opened up a new window on the universe, allowing us to study the most extreme events in the cosmos, such as the merger of black holes and neutron stars.



Isaac Newton's Scientific Method: Turning Data into Evidence about Gravity and Cosmology by William L. Harper

★★★★★ 5 out of 5

Language	: English
File size	: 6428 KB
Text-to-Speech	: Enabled
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Word Wise	: Enabled
Print length	: 360 pages
Lending	: Enabled
Item Weight	: 3.52 ounces
Paperback	: 45 pages
Dimensions	: 7 x 0.11 x 10 inches

This book provides a comprehensive overview of the latest developments in the field of gravitational wave astronomy. It covers the theoretical background, the experimental techniques, and the latest results from the first direct detections of gravitational waves.

The Theoretical Background

Gravitational waves are ripples in spacetime that are caused by the acceleration of massive objects. They travel at the speed of light, and they can be detected by their effect on the relative positions of objects in space.

The theory of general relativity predicts that gravitational waves should be produced by any object that is accelerating. However, the waves are very weak, and they are difficult to detect.

The Experimental Techniques

The first direct detections of gravitational waves were made by the Laser Interferometer Gravitational-Wave Observatory (LIGO). LIGO is a pair of large-scale interferometers that are located in the United States. Each interferometer consists of two arms that are 4 kilometers long. Lasers are shone down the arms, and the interference between the lasers is used to measure the relative positions of the mirrors at the ends of the arms.

When a gravitational wave passes through the interferometer, it causes the mirrors to move slightly. This movement is detected by the lasers, and it can be used to infer the properties of the gravitational wave.

The Latest Results

The first direct detections of gravitational waves were made in 2015. Since then, LIGO has detected a number of other gravitational waves from merging black holes and neutron stars.

The data from these detections has been used to confirm the existence of gravitational waves and to study the properties of black holes and neutron

stars. It has also been used to test the theory of general relativity and to search for new physics.

The detection of gravitational waves has revolutionized our understanding of the universe. It has confirmed the existence of gravitational waves, opened up a new window on the universe, and provided a new tool for testing the theory of general relativity.

This book provides a comprehensive overview of the latest developments in the field of gravitational wave astronomy. It is a valuable resource for anyone who is interested in learning more about this exciting new field.

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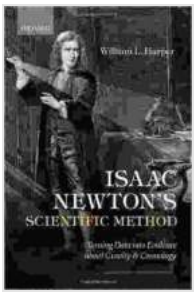

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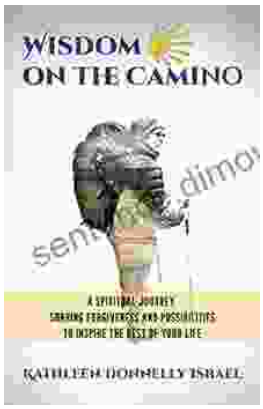

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