



Behind the Scenes of the Universe: From the Higgs to Dark Matter

By *Gianfranco Bertone*

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An extraordinary discovery has recently shaken the foundations of Cosmology and Particle Physics, sparking a scientific revolution that has profoundly modified our understanding of our Universe and that is still far from over. Pioneering astronomers in the 1920s and 1930s had already noticed suspicious anomalies in the motion of celestial bodies in distant galaxies and clusters of galaxies, but it wasn't until the late 20th century that the scientific community was confronted with an astonishing conclusion: the Universe is filled with an unknown, elusive substance that is fundamentally different from anything we have ever seen with our telescopes or measured in our laboratories. It is called dark matter, and it constitutes one of the most pressing challenges of modern science.

In this book, aimed at the general reader with an interest in science, the author illustrates in non-technical terms, borrowing concepts and ideas from other branches of art and literature, the far-reaching implications of this discovery. It has led to a worldwide race to identify the nature of this mysterious form of matter. We may be about to witness a pivotal paradigm shift in Physics, as we set out to test the existence of dark matter particles with a wide array of experiments, including the Large Hadron Collider at CERN, as well as with a new generation of Astroparticle experiments underground and in space.

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Behind the Scenes of the Universe: From the Higgs to Dark Matter By Gianfranco Bertone **Bibliography**

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Editorial Review

Review

"The next few years will be an incredibly exciting time in the search for dark matter in the universe. In this thoroughly enjoyable book, Gianfranco Bertone brings an expert's knowledge and enthusiasm to the subject. It really brings the reader up to the cutting edge of current research."

-- Sean Carroll, theoretical physicist at Caltech and author of *The Particle at the End of the Universe*

"An outstanding and captivating account of our current knowledge of the material composition of our Universe, and the extraordinary efforts undertaken around the world to identify the true nature of dark matter. The book succeeds in describing timely topics in cosmology in an accessible and entertaining style, and in delivering a sense of the enormous scientific challenges in this field."

-- Volker Springel, Heidelberg Institute for Theoretical Studies

"We are living in the golden age of dark matter, where thousands of scientists around the globe are furiously competing to see who will discover the secret of dark matter first. World renowned physicist Gianfranco Bertone offers a unique perspective on this hunt, clearly explaining the evidence that dark matter exists and the various methods people are using to find it. In the world's greatest ongoing reality show, Bertone is the perfect host."

-- Scott Dodelson, Fermi National Accelerator Laboratory and the Kavli Institute for Cosmological Physics

"An excellent overview of the quest to understand the mysterious nature of dark matter, the dominant constituent of matter in the Universe. Bertone, a leading researcher in this field, presents a comprehensive yet concise summary of the history and current status of this puzzle. The book provides a well-written, easily accessible introduction (without equations or technical jargon) to an extremely exciting frontier at the interface between cosmology and particle physics."

-- Avi Loeb, Department of Astronomy, Harvard University

"Understanding the nature of the Universe is one of the most challenging tasks facing mankind, but in this book Gianfranco Bertone tackles the questions posed in a manner totally accessible to all with an interest in the area, from the layperson to the professional scientist. The reader is taken on an exciting journey through astronomy, particle astrophysics and cosmology. A book not to be missed!"

-- James Hough, Institute for Gravitational Research, University of Glasgow

"Bertone is an acknowledged leader in the field and does a wonderful job of bringing readers to the frontier of knowledge. He places the story not simply in the context of physics and astronomy, but also in the context

of science and intellectual endeavor in general. All who are interested in what we know (and even more interesting, what we don't know!) about our place in the universe will find this book a fascinating read."
-- Jonathan Feng, University of California, Irvine

"This well-edited book displays great figures and photos. The numerous references in the footnotes will be useful for ambitious readers desiring original sources. ... Recommended." --*Choice*

Recipient of the Ciel et Espace 2015 prize for best astronomy book.

About the Author

Gianfranco Bertone, *Associate Professor, University of Amsterdam*

Gianfranco Bertone is an Associate Professor at the University of Amsterdam, where he investigates topics at the interface between Particle Physics and Cosmology. After a PhD at the University of Oxford and the Institute of Astrophysics in Paris, he has held teaching and research positions at the Fermi National Accelerator Laboratory, the University of Padova and the University of Zurich, before going back to Paris as a permanent CNRS researcher. He joined in 2011 the new center of excellence in Gravitation and Astroparticle Physics of the University of Amsterdam. He is the editor of the book "Particle Dark Matter: Observations, Models and Searches" and the editor-in-chief of the journal "Physics of the Dark Universe".

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In this 21st century, people become competitive in most way. By being competitive now, people have to do something to make these people survive, being in the middle of the actual crowded place and notice by surrounding. One thing that sometimes many people have underestimated the idea for a while is reading. That's why, by reading a guide your ability to survive raise then having chance to stay than other is high. For you personally who want to start reading a new book, we give you this Behind the Scenes of the Universe: From the Higgs to Dark Matter book as starter and daily reading guide. Why, because this book is usually more than just a book.

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