

Lifting Titan's Veil

Lifting Titan's Veil is a revealing account of the second largest moon in our solar system. This world in orbit around Saturn is the only body in the solar system with an atmosphere strikingly similar to Earth's and the only moon with a substantial atmosphere. Nitrogen is the main gas in Titan's atmosphere but it is laced with a cocktail of hydrocarbons and is virtually opaque to human eyes because of layers of orange smog. Beneath the haze, lakes of liquid methane may be a feature of the frigid landscape. Titan is like a giant laboratory in deep freeze that may help scientists understand the first chemical steps towards the origin of life.

Beginning with its discovery in 1655, the authors describe our current knowledge of Titan, including observations made before the space age, results from the exciting *Voyager* missions of the 1980s, and the most recent revelations from the world's most advanced telescopes. Ralph Lorenz has been closely involved with the *Cassini* mission, which will reach Saturn in 2004 and release the *Huygens* probe into Titan's atmosphere in 2005. Looking forward with anticipation to the new discoveries *Cassini-Huygens* is expected to make, he includes some of his personal experiences in preparing for the mission. Jacqueline Mitton brings a wealth of experience in writing accessible books on astronomy.

This book will appeal to readers interested in astronomical discovery and space exploration. It is a splendid introduction to Titan, and essential reading for anyone who wants to be ready for the arrival of *Cassini-Huygens* in 2004.

RALPH LORENZ trained as an engineer and worked for the European Space Agency at the very beginning of the *Huygens* project. Since obtaining a Ph.D. at the University of Kent, England, he has worked as a planetary scientist at the University of Arizona, USA. His research interests focus on Titan, but also include climatology, radar, impact dynamics and spacecraft and instrumentation design. He has been involved in NASA's largest planetary mission (*Cassini*) and its smallest (the *DS-2 Mars Microprobes*).

JACQUELINE MITTON obtained a Ph.D. in astrophysics from the University of Cambridge, and is now a full-time writer and media consultant specialising in astronomy. She has acted as Press Officer for the Royal Astronomical Society since 1989, and was Editor of the *Journal of the British Astronomical Association* 1989–1993. She has written or co-authored sixteen published astronomy books.

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Exploring the giant moon of Saturn

Ralph Lorenz
and Jacqueline Mitton



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Preface

This book is about several things. Our knowledge of Titan has expanded enormously in the last decade and, first and foremost, we have written about Titan itself, a mysterious world of ice and rock orbiting Saturn. But science is not a smooth and steady ascent to enlightenment. There are false steps and stumbles along the way. The story of *how* we have found out about Titan is as fascinating as *what* we actually know. This is our second major theme. Finally, we anticipate the arrival at Saturn of the *Cassini–Huygens* mission, tracing the development of this massive international project and speculating on what it might find when it reaches its destination.

Planetary exploration is a huge collaborative undertaking, and it has not been possible to mention every participant by name. Similarly, many people, organisations and parts of the *Cassini* project have not been included. Since this particular book is about Titan, we have included the features and details of the mission most relevant to our topic.

Much of the story we tell here is written from personal experience but, to avoid a schizophrenic style, the particularly personal episodes are distinguished by passages under the heading ‘Ralph’s Log’. The reader could skip these without losing much of the thread of the book, although we’d urge that you do not do so – we think the personal insights here add a unique dimension to our account. (For the record, no such ‘Log’ exists – the episodes and details have been recorded here from memory. Lorenz accepts responsibility for any inaccuracies.) There is of course a tendency in describing investigations in which one is involved to emphasise one’s own contributions. This book is probably not immune from such tendencies even though we have endeavoured to give a balanced account overall.

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We are indebted to our many colleagues who answered questions, and directed us to reference material and sources of illustrations. Others gave permission to use graphic material, for which we are grateful,

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including Gordon Garrard, Tetsuya Tokano and Mark Garlick.
Special thanks are due to James Garry. A critical reading of the manuscript by Zibi Turtle improved it considerably.

Last but not least, we thank the American and European taxpayers, without whom there would be few discoveries to write about or look forward to.

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