



## **Musimathics: The Mathematical Foundations of Music (MIT Press) (Volume 2)**

By Gareth Loy

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Volume 2 of *Musimathics* continues the story of music engineering begun in Volume 1, focusing on the digital and computational domain. Loy goes deeper into the mathematics of music and sound, beginning with digital audio, sampling, and binary numbers, as well as complex numbers and how they simplify representation of musical signals. Chapters cover the Fourier transform, convolution, filtering, resonance, the wave equation, acoustical systems, sound synthesis, the short-time Fourier transform, and the wavelet transform. These subjects provide the theoretical underpinnings of today's music technology. The examples given are all practical problems in music and audio.

Additional material can be found at <http://www.musimathics.com>.

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### Editorial Review

#### Review

From his long and successful experience as a composer and computer-music researcher, Gareth Loy knows what is challenging and what is important. That comprehensiveness makes *Musimathics* both exciting and enlightening. The book is crystal clear, so that even advanced issues appear simple. *Musimathics* will be essential for those who want to understand the scientific foundations of music, and for anyone wishing to create or process musical sounds with computers.

(Jean-Claude Risset, Laboratoire de Mécanique et d'Acoustique, CNRS, France)

Volume 1 of *Musimathics* is the ideal introduction to the science of musical acoustics and composition theory, and volume 2 succeeds as no other tutorial does in making the theory of computer music and digital signal processing accessible to a broad audience. Loy's typically careful treatment leads to a book that combines readability and fun with exhaustive and meticulous coverage of each of the topics he addresses. It can serve equally well as an introduction and as a desk reference for experts.

(Stephen Travis Pope, CREATE Lab, Department of Music, University of California, Santa Barbara)

Music and mathematics enjoy many points of intersection. Just think of musical scales and number theory, or the impact of computers - both analog and digital - on the composition and creation of musical sounds. The second volume of *Musimathics* ably covers these and many other instances of this happy union: Fourier and wavelet transforms, natural and artificial reverberation, and much more.

(Manfred Schroeder, Professor of Physics, University of Goettingen)

#### About the Author

Gareth Loy is a musician and award-winning composer. He has published widely and, during a long and successful career at the cutting edge of multimedia computing, has worked as a researcher, lecturer, programmer, software architect, and digital systems engineer. He is President of Gareth, Inc., a provider of software engineering and consulting services internationally.

### Users Review

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##### Richard Reardon:

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**Nancy Hartsell:**

This Musimathics: The Mathematical Foundations of Music (MIT Press) (Volume 2) is great book for you because the content that is certainly full of information for you who all always deal with world and also have to make decision every minute. This particular book reveal it facts accurately using great organize word or we can declare no rambling sentences in it. So if you are read that hurriedly you can have whole details in it. Doesn't mean it only provides you with straight forward sentences but challenging core information with wonderful delivering sentences. Having Musimathics: The Mathematical Foundations of Music (MIT Press) (Volume 2) in your hand like keeping the world in your arm, details in it is not ridiculous just one. We can say that no reserve that offer you world throughout ten or fifteen second right but this publication already do that. So , this really is good reading book. Hey there Mr. and Mrs. hectic do you still doubt which?

**Agatha Roughton:**

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**Travis Hargrove:**

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